UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

YAMAHA CORPORATION OF AMERICA
Petitioner

v.

BLACK HILLS MEDIA, LLC
Patent Owner

Case No. IPR2013-00597
U.S. Patent 8,230,099

DECLARATION OF Gareth Loy, D.M.A.

TABLE OF CONTENTS

I, Gareth Loy, declare:

I. INTRODUCTION

1. I have been retained by Counsel for Patent Owner to provide opinions on certain issues concerning *Inter Partes* Review No. IPR2013-00597 of U.S. Patent No. 8,230,099 ("the '099 Patent").

2. I am aware that the Petition filed in the above-identified proceeding asserted various grounds and that the Patent Trial and Appeals Board ("Board") instituted this proceeding on a subset of the asserted grounds. I am also aware that Petitioner submitted with the Petition a declaration of V. Michael Bove, Jr., Ph.D. opining on claim construction and the validity of the challenged claims.

3. I have been asked to analyze the '099 Patent, the art cited by the Petitioner, the Bove Report, and the Institution Decision dated March 20, 2014 ("the Institution Decision") as they relate to the particular grounds instituted by the Board. I understand that the Board instituted this proceeding on the grounds as stated below:

References	Basis	Challenged Claims
US2002/0087996 (B)i	§ 102(b)	1, 2, 6, and 9-12
WO01/17142 (Gladwin)	§ 102(b)	1, 2, 6, 9, 11, 12
US 6,502,194 (Berman)	§ 103(a)	1, 2, 6, 9, 11, 12

4. My opinions are set forth below. I make these statements based upon facts and matters within my own knowledge or on information provided to me by others. All such facts and matters are true to the best of my knowledge and belief.

II. BACKGROUND AND QUALIFICATIONS

5. I am the President of Gareth, Inc., which provides software engineering, consulting, and litigation support to high-technology companies internationally. Gareth Inc. provides research and development services including product development, coding and documentation. Gareth Inc. also provides a wide variety of software engineering services including embedded systems, real-time systems, operating systems support and development, file systems, compilers, parallel processing systems, and digital signal processing (DSP) systems.

6. Gareth Inc. has prepared and provided compilers, interpreters and assemblers, enterprise software systems, chip architectures, software architectures, real-time operating systems, home entertainment systems, embedded systems, instruction set architectures, datasheets, databooks, user guides, and custom automated documentation systems. Technology clients have included Infineon, Philips Semiconductor, Trimedia Technologies, Equator Technologies, Pixim, Inc., Palm, Inc., Sonic

Solutions, Sony Corporation of America, Chromatic Research, Raza Microelectronics, Cradle Technologies, Siemens Microelectronics, Zoran Corporation, Dolby Laboratories, and C-Cube Microsystems.

7. I have over 37 years of academic and professional experience in computer science, software development, embedded systems, networking, enterprise software systems, digital audio signal processing, and music technology. I received my doctorate from Stanford University in 1980, where I studied under John Chowning at the Center for Computer Research in Music and Acoustics, which was a center within the Stanford Artificial Intelligence Laboratory directed by John McCarthy at the time.

8. I was an early Apple Computer employee, having been hired there in 1979 full time while still in graduate school. I worked for Jef Raskin who reported directly to Steve Jobs, founder and CEO of Apple Computer. I left Apple in 1980 to teach at UCSD where I taught, for a decade, graduate and undergraduate courses in computer science and digital audio, and cofounded the Computer Audio Research Laboratory there.

9. I have published widely in various peer-reviewed journals, and have authored three books with the MIT Press, including *Musimathics*, a two-volume introduction and reference to the mathematics of music published by the MIT Press.

10. I have been a Software Architect for multiple consumer and professional products for large international electronics companies and have sustained a long and successful career at the cutting edge of software development and multimedia computing.

11. I am experienced in a variety of computer science domains, ranging from embedded systems, digital home entertainment systems, graphical user interfaces, real-time operating systems, parallel processing systems, signal processing computers, device drivers, and software for film, music, and audio. I have extensive experience in use of multiprocessor/multicore architectures to solve problems in digital audio signal processing. I have also provided expertise in compiler design, file systems, operating systems, handheld networked Personal Information Management (PIM) devices, network audio streaming systems, wireless remote control systems, digital loudspeaker systems, digital home entertainment systems, enterprise email systems, software for factory automation systems, interactive databases, enterprise software for managing of music libraries, MPEG audio compression, on-line gaming, composition systems, digital camera hardware and software, digital audio hardware and software technologies, and more.

12. I also have over seventeen years of experience as an expert witness on numerous cases. Most recently, I testified at an International Trade Commission Investigation No. 337-TA-882 hearing involving U.S. Patent Nos. 8,214,873 and 8,230,099. I have also testified before a jury under oath, have provided Markman claim construction testimony, and have presented exhibits and Markman tutorials in federal court in trademark infringement, inequitable conduct, and patent technology litigation. I have been retained as an expert witness in such areas as software for handheld networked Personal Information Management (PIM) devices, digital music player software, enterprise email systems, software for factory automation systems, digital camera hardware and software, internet customer tracking systems, SAP billing systems, interactive databases, software for management of music libraries, Digital Audio Recording Devices (DARD), MPEG audio compression, on-line gaming, human interface design, music composition systems, MIDI systems, network audio streaming systems, rendering of 3D digital audio, and digital audio hardware and software technologies.

13. A complete list of my qualifications, including a list of my publications and lectures is included in my CV, which is attached as APPENDIX A.

14. In connection with forming my opinions, I reviewed the documents listed in Exhibit B. Particularly, I analyzed the '099 patent and the art on which the trial was instituted. I also reviewed the September 19, 2013, Declaration of V. Michael Bove, Jr. ("Bove Declaration") and the Institution Decision dated March 20, 2013 ("the Institution Decision") as they relate to the grounds instituted by the Board. In addition, I also attended Dr. Bove's deposition on May 29, 2014. My opinions are set forth below. I make these statements based upon facts and matters within my own knowledge or on information provided to me by others. All such facts and matters are true to the best of my knowledge and belief.

III. LEGAL STANDARDS

A. Anticipation

15. I understand that a claim is anticipated if a single prior art reference discloses, explicitly or inherently, all limitations of the invention arranged or combined in the same way as in the claim. I further understand that inherency may not be established by probabilities or possibilities, and the fact that one of ordinary skill in the art understands that the missing limitation could exist under certain circumstances is not sufficient. Instead, the party claiming inherency must prove that the missing matter is necessarily present and that it would be so recognized by a person of ordinary

skill in the relevant art. Whether the inherent disclosure was recognized at the time of the reference is immaterial.

16. I further understand that the disclosure of an anticipatory reference must describe the claimed invention to a degree adequate to enable person of ordinary skill in the art to not only comprehend the invention, but also to make, or in the case of a method, use, the claimed invention without undue experimentation. Provided that the reference asserted is enabling, it is my understanding that it need not disclose any independent use or utility to anticipate a claimed invention.

B. Obviousness

17. It is my understanding that an invention is unpatentable if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. I further understand that obviousness is determined by evaluating: (1) the scope and content of the prior art, (2) the differences between the prior art and the claim, (3) the level of ordinary skill in the art, and (4) secondary considerations of non-obviousness. To establish obviousness based on a combination of the elements disclosed in the prior art, it is my understanding that a petitioner must identify a *specific combination* that teaches all limitations and establish

that a person of ordinary skill in the art at the time of the claimed invention would have found it obvious to make that combination.

18. To guard against hindsight and an unwarranted finding of obviousness, I understand that an important component of any obviousness inquiry is whether the petitioner has identified any teaching, suggestion or motivation that would have prompted a person of ordinary skill in the art to make the claimed combination and have a reasonable expectation of success in doing so. I understand that this test should not be rigidly applied, but can be an important tool to avoid the use of hindsight in the determination of obviousness.

19. I further understand that the teaching, suggestion, or motivation may be found explicitly or implicitly: (1) in the prior art; (2) in the knowledge of those of ordinary skill in the art that certain references, or disclosures in those references, are of special interest or importance in the field; or (3) from the nature of the problem to be solved. Additionally, I understand that the legal determination of the motivation to combine references allows recourse to logic, judgment, and common sense. In order to resist the temptation to read into prior art the teachings of the invention in issue, however, it should be apparent that the expert is not conflating "common sense" and what appears obvious in hindsight.

20. I understand that if the teachings of a prior art would lead a person of ordinary skill in the art to make a modification that would render another prior art device inoperable, then such a modification would generally not be obvious. I also understand that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.

21. I understand that it is improper to combine references where the references teach away from their combination. I understand that a reference may be said to teach away when a person of ordinary skill in the relevant art, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. In general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the patentee. I understand that a reference teaches away, for example, if (1) the combination would produce a seemingly inoperative device, or (2) the references leave the impression that the product would not have the property sought by the patentee. I also understand, however, that a reference does not teach away if it merely expresses a general preference for

an alternative invention but does not criticize, discredit, or otherwise discourage investigation into the invention claimed.

22. I understand that where the party asserting invalidity establishes a prima facie case of obviousness, the burden shifts to the patent owner to come forward with objective evidence demonstrating secondary considerations of non-obviousness. I have been instructed that secondary considerations include: (1) long-felt but unsolved need; (2) commercial success of the invention; (3) failed efforts of others; (4) copying by others; (5) praise for the invention; (7) unexpected results; (8) disbelief of experts; (9) general skepticism of those in the art; (10) commercial acquiescence; and (11) simultaneous development. I understand that evidence of secondary considerations must be considered as part of all the evidence, not just when the decision maker remains in doubt after reviewing the art.

23. I also understand that there must be a nexus between the claimed invention and the secondary considerations before the evidence is relevant to the question of obviousness. In particular, in the case of commercial success of a product embodying the claimed invention, I understand that the success must be shown to have in some way been due to the nature of the claimed invention, as opposed to other economic or commercial factors unrelated to the technical quality of the patented subject

matter. I understand that commercial acceptance and licensing are indicative of nonobviousness where it involves prominent or a substantial portion of the competitors in the relevant market.

IV. DEFINITION OF THE PERSON OF SKILL IN THE ART

24. I understand that the Patentee proposed a definition of a person of ordinary skill in the art as having a bachelor's degree in computer science or electrical engineering and one year of practical experience with networked media. I also understand that the Petitioner, on the other hand, proposed that a person of ordinary skill in the art would have a bachelor's degree in computer science or electrical engineering and *at least one year* of practical experience. Because the Petitioner's definition specifies an unlimited range of years, it is therefore overly expansive, and would include persons who are overqualified to be considered to have "ordinary skill in the art." The Patentee's definition is limited, and more in line with the qualifications and experience that a typical person of skill in the art would have had in 2004.

V. THE STATE OF RELEVANT ART

25. In 2004, the primary mode of consumer digital audio media distribution was by compact discs ("CDs"), as well as by digital video disks ("DVDs") for digital video media. (Bove Tr., Ex. 2012 at 120:5-

121:19) In the early 2000's, the availability of technology that allowed for compression of digital music and video files, for example using MPEG technology, such as MP3 for compression of audio files, began to allow convenient storage of multiple media files on the hard drive of a personal computer. Media compression provided by, for example, MPEG and MP3 standards allowed the data load on networks, storage systems, and microprocessors to be accommodated, enabling the delivery of audio and video media across networks to personal computers. Users could then download media from personal computers to handheld media players such as MP3 players. The media players could then be detached and carried portably, typically playing music via headphones.

26. Nonetheless, since the early 2000's, advances in networking speed made media file sharing more feasible. With regard to audio files, MP3 technology was utilized, for example, to copy media from a CD (i.e., "to rip the CD") and then compress and store the media on a computer for later playback by the computer that equipped with a sound card. For example, the Windows Media Player application available from Microsoft in 2004 could rip CDs from the CD-ROM drive of a personal computer. . (See, e.g., Ex. 2013, "Windows Media Player 9 Series, Copying music from CDs, © 2000-2002 Microsoft Corporation"). MP3 compression

technology also facilitated downloading of media from servers on the Internet onto a computer, although the download speed was limited by the network bandwidth available in those times.

27. Though the MP3 standard was published in 1983, it was not until the early 2000's that MP3 began to be widely used by consumers. (Bove Tr., Ex. 2012 at 120:21-24) For example, Napster, an independent peer-to-peer file sharing service that operated between June 1999 and July 2001, allowed users to easily share their MP3 files. Portable MP3 players began to be available in the late 1990's and early 2000's. For example, the iPod from Apple computer was released on October 23, 2001. (http://www.ilounge.com/index.php/articles/comments/instant-expert-a-brief-history-of-ipod/#2004 (site last visited on 6/6/2014); Ex. 2014, "A Brief History of iPod.pdf," see, e.g., p. 1 "Key Milestones in the Life of the iPod 2001"). MP3 media ripped from a CD or purchased online could be stored on a computer, and from there could be downloaded onto a portable MP3 player such as the iPod. These portable devices depended upon the services of a general-purpose computer such as a desktop or laptop personal computer to provide networking, computation, input/output ports, and bulk storage. The usage paradigm for an MP3 player, for example, was to tether it via a cable to a computer, to run an application on the computer such

as Microsoft Windows Media Player or Apple iTunes that accessed a web site containing media content, and use that application to download media and playlists to the computer, and then from the computer to download a subset of the media to the MP3 player, which could then be detached and used portably.

28. In 2004, remote control of player devices was effected by the use of conventional optical infrared (CIR) technology, where a simple handheld device such as a dedicated remote control for a television or CD player was made up of simple circuits responsive to buttons a user would press; an infrared transmitter on the remote control would then direct a modulated infrared light beam to an infrared sensor on an associated player device communicating a simple code to control the transport mechanism or adjust the volume level of the player device. (http://www.phidgets.com/docs/IR_Remote_Control_Primer (site last visited on 6/6/2014); Ex. 2015,"IR Remote Control Primer - Phidgets Support.pdf"). Importantly, these simple dedicated remote controls were not provisioned to receive anything other than button presses by the person using the remote. Specifically, they were not designed to receive a playlist from a remote source, present the playlist to a user on the remote device, receive a user selection, and direct a player device to play the selected media item. CIR

technology, introduced as Dr. Bove points out [Bove Decl., ¶14] in the 1980's, was only designed for unidirectional transmission of individual low-bandwidth control codes from a handheld remote control to a consumer electronics device such as a TV or CD player. (http://www.howstuffworks.com/inside-rc.htm/printable (site last visited on 6/6/14); Ex. 2016, "HowStuffWorks Inside a TV Remote Control.pdf"). CIR remote controls are still ubiquitous even today because of their simplicity and low cost, and because the typical usage paradigm of most media players is that the user must be in line-of-sight with (typically in the same room as) the controlled system. Optical technologies such as IrDA (Infrared Data Association) have been developed to improve data throughput and reliability (e.g., for communications between a personal computer and an IrDA mouse or keyboard), but IrDA has even shorter range than standard CIR systems (IrDA range is one meter) and is subject to the same line-of-sight restrictions as CIR devices. (http://www.irda.org (site last visited on 6/6/2014); Ex. 2017, "Welcome to IrDA.pdf"; http://en.wikipedia.org/wiki/Infrared_Ex. 2017

29. Data Association (site last visited on 6/6/2014); Ex. 2018, "Infrared Data Association - Wikipedia, the free encyclopedia.pdf").

30. Although in 2004, a handful of networked and cellular-enabled portable devices with general purpose processors such as the Pocket PC (http://en.wikipedia.org/wiki/Pocket_PC_2002 (site last visited on 6/6/2014); Ex. 2019, "Pocket PC 2002 - Wikipedia, the free encyclopedia.pdf") and the Smartphone (http://en.wikipedia.org/wiki/Smartphone (site last visited on 6/6/2014); Ex. 2020, "Smartphone - Wikipedia, the free encyclopedia.pdf") were available, in the time frame of the '099 patent, wireless handheld remote control systems did not allow a mobile device to receive a playlist from a content server, display it to a user, receive a user media selection, and direct a media player device associated with but separate from the wireless handheld remote control to play the selected media item. These capabilities would eventually evolve in subsequent years as the utility of such advanced mobile devices was further developed.

31. Indeed, Dr. Bove testified that he was not aware of anyone in 2004 selling a PDA (e.g., a pocket PC) that would be able to control a playback device to play a media item obtained from a content server. (Bove Tr., Ex. 2012, at 129:7-130:1. Dr. Bove was also not aware of any infrared remote (CIR) controls in 2004 that had bidirectional communication with player devices. (Bove Tr., Ex. 2012, at 130:7-12).

VI. OVERVIEW OF THE US 8,230,099 PATENT

32. I understand that invalidity analysis begins at the relevant date of the technology at issue. The relevant date for the '099 patent is the filing date of the earliest priority application, which is May 5, 2004.

33. The '099 patent is generally directed to employing a wireless hand-held remote control to receive a playlist and present the playlist to a user from which the user can select at least one media item for playback by a media player device. The '099 patent relates to systems and methods for sharing playlists among a remote source (such as a networked server), a wireless hand-held remote control and media player devices, where the media player devices are associated with and separate from the wireless hand-held remote control.

34. Figure 2 of the '099 patent, reproduced below, shows an embodiment in which a playlist is communicated from server 11 via the internet 12, and the playlist is received by remote control 18. ['099 at 9:1-4] The playlist is displayed on the remote control and a user can choose a media item from the playlist to be played by a dedicated media player. ['099 at 9:5-8]

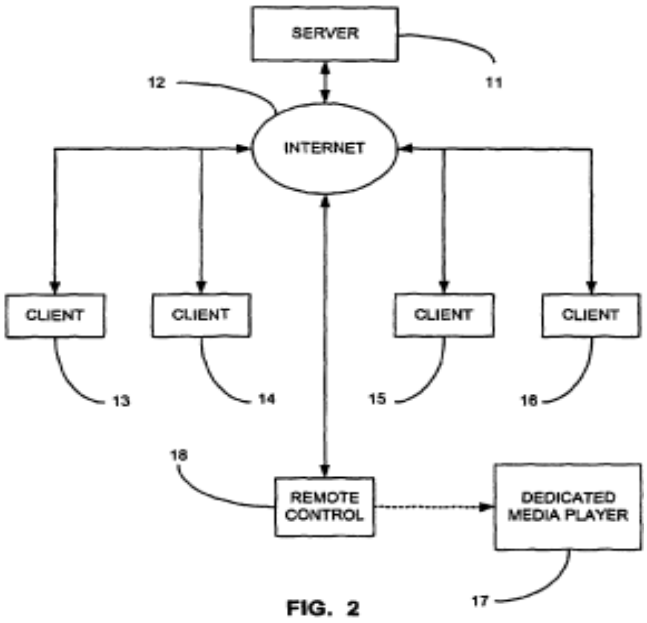

FIG. 2

35. The ‘099 patent further provides that the dedicated media player 17 itself could receive playlists from the server, as well as from the hand-held remote. [‘099 at 8:58-61] Additionally, the ‘099 patent describes that playlists communicated to the dedicated media player “may be further communicated to a remote control therefore.” [‘099 at 9:10-11]. This communication may be from the dedicated media player 17 or from any other source (such as from the server 11 via the Internet 12).” [‘099 at 9:9-13].

36. A key feature of the ‘099 patent is the provision of the hand-held remote with a direct network connection — separate from the media player device — so that it can communicate directly with other internet-enabled devices, such as the dedicated media player and remote server, on an equal footing. As a result of this versatile communication of

playlists from the Internet to the dedicated media player and/or the remote control, the "playlists may be stored in, displayed upon, and used to make selections from either the dedicated media player 17, the remote control 18, or both." ['099 at 9:21-23]

37. Importantly, the prior art does not anticipate a wireless handheld remote control that would allow a user to receive a playlist on the wireless handheld remote control directly from a server via a network. In May 2004, the state of the art was limited to obtaining playlists via a computer, not directly on a wireless handheld remote control. As described above, portable devices such as MP3 players received playlists from computers and could not receive them directly from the Internet because these devices were tethered to, and dependent upon, a computer for network access and required computational power. For example, the Apple iPod introduced in 2001 was tethered or docked to a portable computer for downloading media and playlists. (http://manuals.info.apple.com/MANUALS/1000/MA1195/en_US/iPod_classic_160GB_User_Guide.pdf; "iPod_classic_160GB_User_Guide.pdf" page 10 search for "Connecting iPod Classic") Ex. 2021. Such players had no capability to act as remote controls. Remote control technology — then as now — depended upon line-of-sight optical unidirectional CIR technology.

Thus, in the timeframe of the technology at issue, there was no capability to perform the limitations of the '099 patent to receive a playlist on a remote control device, display it to a user, receive a media selection from a user and then direct a player device to play the selected media item.

VII. OPINIONS AS TO CLAIM CONSTRUCTION OF THE '099 PATENT

38. I understand that in an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear.

a. "Playlist"

39. I further understand that the Board has interpreted claim term "playlist" to mean "a list of media selections." (IPR2013-00597, Paper 15, p. 9)

40. I believe that the Board's interpretation of the term "playlist" is not consistent with its plain and ordinary meaning and its broadest *reasonable* construction of that term in light of the specification of the '099 patent. Consistent with how a person of ordinary skill in the art would use and understand the term in the context of the '099 patent, a person of ordinary skill in the art would understand the term "playlist" to mean "a list referencing media items arranged to be played in a sequence."

41. The Board refers to the following sentence from the Background Section of the '099 patent in its discussion of the term playlist: "A playlist is a list of a user's favorite selections." Below is the paragraph of the '099 patent in which the above sentence appears:

> "Playlists for music and movies are well known. A playlist is a list of a user's favorite selections. Popular personal computer (PC) media playing programs, such as Windows Media Player (a trademark of Microsoft Corporation), offer the capability for a user to *compile a playlist*. The user may subsequently select items to be played from the playlist and the media playing program *then plays the selected items*. The use of such a playlist simplifies the selection process and thus makes listening to music or viewing movies easier and more enjoyable." [1:33-42] (Emphasis added)

42. The above sentence in the background of the '099 patent to which the Board refers, when read in the context of the paragraph in which it appears, and when read in the context of the entirety of the '099 patent, is consistent with the use of the term playlist in the '099 patent as referring to a list of media items that are arranged to be played in a sequence. Any other

interpretation of the term "playlist" is contrary to the meaning in the context of the '099 patent. This paragraph makes clear that a user can "compile a playlist" by using Windows Media Player. It is well known in the art that a playlist generated by Windows Media Player, to which the '099 patent refers in the above paragraph, is a list referencing media items that are arranged to be played in a sequence. For example, in"Microsoft Windows Media Player 7 Handbook", the "Shuffle" feature of Windows Media Player is described as follows: "Shuflle — This plays the items in the current playlist in a random order. It does not change the order of the items in the play list, only the order in which they are played while the shuffle option is selected." (Seth McEvoy, "Microsoft Windows Media Player 7 Handbook", Microsoft Press, ISBN 0-7356- 1 178-5, Copyright© 2000, p. 40) Ex. 2022. It is clear from this that it was well known that a playlist was a list referencing media items arranged to be played in a sequence.

43. Moreover, the '099 patent repeatedly emphasizes that a playlist is a list referencing media items arranged to be played in a sequence. The '099 patent specifies:

> "The player device is configured to receive a playlist, *queue the playlist*, display the playlist, and play

a selection from the playlist." [Abstract] (emphasis added)

44. In computer science, the term "queue" means, "a linear list for which all insertions are made at one end of the list; all deletions (and usually all accesses) are made at the other end." (Knuth, Donald. *The Art of Computer Programming*, Volume 1, Fundamental Algorithms, Section 2.2.1 ("Stacks, Queues, Dequeues"), Third Edition (Reading, Massachusetts: Addison-Wesley, 1997) ISBN 0-201-89683-4; "Knuth - definition of queue.pdf") Ex. 2023. A consequence of Knuth's definition is that the structure of a queue's contents at any moment are determined by the order of insertion. If, for example, a radio disc jockey piles up a stack of records from the station's archives to play on air, the resulting stack of records is a queue if she begins playing the stack with the record on top (i.e., the last one chosen from the archives).

45. Therefore, a person of ordinary skill in the art would understand that to "queue the playlist" means to address the player to play the entire media content identified by the indicated playlist, and to play the entire media content of the playlist in sequence.

46. The '099 patent further states:

"*Playlists also facilitate the playing of a plurality of selections in a particular order*. That is, the p*laylist may be compiled* in an order in which the playing of selections therefrom is desired. The selections may then be *automatically played sequentially from the playlist*. Typically, selections may also be played randomly from a playlist." ['099 1:45-52] (emphasis added)

The above paragraph makes clear that in the context of the '099 patent a playlist allows a user to listen to the media compiled in the playlist automatically played in a sequential order. The playlist may be compiled such that the media selections are played in an order desired by a user, or a user may not have any input regarding the order in which the media selections are played. In all cases, *the playlist provides a list referencing media items arranged to be played in a sequence*.

47. The '099 patent further states:

"Playlists are typically compiled by reviewing a list of selections available for play and then choosing those selections that the user would like to have on the playlist. Thus, a user may review songs that are stored on a personal computer's hard drive and *compile a playlist*

therefrom, for example." ('099 1:54-56) (emphasis added)

48. In the time frame of the '099 patent, it was well known to laypersons as well as those of ordinary skill in the art that compiling a playlist of songs meant arranging a list of songs such that the songs can be played in a sequential order. (Seth McEvoy, "Microsoft Windows Media Player 7 Handbook", Microsoft Press, ISBN 0-7356- 1 178-5, Copyright© 2000, p. 40); Ex. 2022 discussion of the "Shuffle" function which refers to "the order of the items in the playlist". The patentee's usage of the term "playlist" is consistent with its usage and meaning in media arts, including the broadcast (TV/radio) industries. For example, the ENCO Digital Audio Delivery System was a computer system developed in the 1990's that allowed radio broadcasters to manage station operations. Its *Operations Manual* included a PLAY command to play a playlist, and the document states, "Touch the PLAY button on the playback machine, and your playlist will begin playing. It will play each cut in succession, with no further input from you." (*The DAD486x Digital Audio Delivery System Operation Manual*, p. 3-13, June 30, 1995; "The DAD486x Digital Audio Delivery System Operation Manual.pdf"); Ex. 2024.

49. The term playlist as cited in dictionaries further supports the patent's usage of the term playlist. For example, the "Broadcast Dictionary" published online by the Broadcast Educators, LLC defines the term playlist as "A list of clips to be played in order." (http://dictionary.broadcasteducators.com/sections/p; "P | Broadcast Dictionary.pdf"); Ex. 2025.

50. In 2004, Apple computer published a version of its iPod User's Guide and informed users they could "Organize songs into playlists you create" ("Using iPod", p 24, http://manuals.info.apple.com/MANUALS/0/MA517/en_US/iPodDockConnectorUserGuide.PDF; "Using iPod.pdf" page 24); Ex. 2026. It goes on to say, "Using iTunes, you can organize songs into playlists. For example, you can create a playlist with songs to listen to while exercising or with songs for a particular mood." [Using iPod, p. 26, http://manuals.info.apple.com/MANUALS/0/MA517/en_US/iPodDockConnectorUserGuide.PDF; "Using iPod.pdf" page 26]

51. The '099 patent further states:

> "The sharing of playlists is also known. Popular file sharing programs, such as Kazaa (a trademark of Sharman Networks), facilitate the sharing of playlists.

> Using such systems, it is possible for a user to download a list of songs or movies that another individual has compiled. This *list* may then be used to *make or modify a playlist* for the user." ['099 1:64-2:2] (emphasis added)

52. In the above paragraph, the '099 patent distinguishes a "list" from a "playlist." In other words, one of ordinary skill in the art will understand that the '099 patent makes clear that a playlist of media items is not simply a list of a media items.

53. The '099 patent further recites:

> "The present invention provides the ability for non-computer devices to display and play playlists from a central computer running on the Internet." [10:61-63].

54. As demonstrated by the citations given above, a person of ordinary skill in the art at the time of the invention would understand that to play a playlist means to play the entire playlist in sequence.

55. Petitioner's expert, Dr. Bove, opines that his reading of the '099 patent demonstrates to him that a playlist "is simply a list of media items from which a user may make selections." (Bove decl. at ¶12). However, Dr. Bove's reasoning does not support his conclusions. None of the passages of the '099 patent to which Dr. Bove refers supports his opinion

that the term "playlist" as used in the '099 patent "is simply a list of media items from which a user may make selections." *Id.* Dr. Bove states that a discussion of playlists in the '099 specification ['099 1:33-2:26] describes a playlist as "a list of user's favorite selections." *Id*. As I discussed above, this reference to the playlist as a list of user's favorite selections, when read in the context of the paragraph in which it appears as well as the rest of the '099 patent, is consistent with the Patentee's construction of the term playlist. Dr. Bove further states that the '099 patent describes sharing of playlists and "identifying playlists that are likely to contain selections that will be enjoyed by a user." *Id.* Dr. Bove does not, however, explain why this passage of the '099 patent supports the construction that Dr. Bove proposes for the term "playlist." The fact that a playlist may contain selections that will be enjoyed by a user is in no way inconsistent with the construction of a playlist as a list referencing media items arranged to be played in a sequence. Dr. Bove further states the '099 patent at 4:15-17 discloses "a method of defining a playlist, wherein the method comprises defining a user profile and the user profile is used to determine selections that may be enjoyed by a user." *Id.* Again, the fact that a playlist may be defined based on a user profile does not lead to the conclusion that the playlist means something other than what one of ordinary skill in the art would understand that term to mean, namely, a list

referencing media items arranged to be played in a sequence. Further, Dr. Bove states that the '099 patent discloses at 4:51-61 automatically updating a playlist without user intervention. *Id.* Just because a playlist is generated by an algorithm of some kind does not mean it has no order.

56. At his deposition, Petitioner's expert, Dr. Bove, agreed that a playlist is a list of items arranged in an order, explaining that "being a list, items on a list are in an order." (Bove Tr., Ex. 2012, at 294:2-25; see also 295:1-10; 221:14-21; 215:1-4 (stating that a playlist, "by virtue of it being a list, the items appear in an order"; 215:20-216:2 (stating that "I think the plain meaning of 'list' implies that there is an order in which items appear. That makes it a list.").

57. Dr. Bove also agreed that a playlist is a list of items designed to be played, stating that the "items on the list are intended to be played or at least potentially played. So one could select one or some other subset thereof and play those individual items rather than playing the entire list." (Bove Tr., Ex. 2012, at 216:23-217:7) I agree with Dr. Bove that a playlist is a list of items designed to be played, and believe it is consistent with the understanding by a person of ordinary skill in the art in 2004.

58. Dr. Bove also conceded that the items in a playlist are played in a sequence unless the user selects a different order: "commonly a

user interface would provide the ability to play the items in the sequence in which they appear, as well as playing them potentially in some other order or selecting some subset and playing the subset." (Bove Tr., Ex. 2012 at 217:21-218:4)

59. In conclusion, I believe that one of ordinary skill in the art would understand the term "playlist" as used in the '099 patent as the Patentee has defined that term, namely, a list referencing media items arranged to be played in a sequence.

b. "A wireless handheld remote control which is associated with and separate from the media player device"

60. One of ordinary skill would understand from the '099 patent that "a wireless handheld remote control which is associated with and separate from the media player device" means a handheld remote control that can operate as an *independent* device relative to the media player that it controls. For example, the '099 patent makes clear that the remote control can receive playlists; further, that the playlists can be received from a remote source via a network; that the playlists can be received from network sources other than the media player; that it can present playlists to users; that it can allow users to select media items from the playlists; and that the remote can direct player devices to play selected media items. Individually, these are

novel features in comparison to even the most advanced remote controls of 2004; collectively they are revolutionary, and presage the advent of technologies that only came years after the filing of the patent.

61. For example, the '099 patent states:

> Referring now to FIG. 2, rather than communicating a playlist to the dedicated media player 17, the playlist may alternatively be communicated to a remote control 18 for the dedicated media player. [9:1-4]

62. The '099 patent further recites:

> The *user's device* may be, for example, the dedicated media player 17 of FIGS. 1 and 2 or *may alternatively be the remote control 18* of FIG. 2. [9: 20-27] (Emphasis added).

63. In another passage, the '099 patent indicates:

> Referring now to FIG. 5, rather than communicating a playlist to the dedicated media player 47, the playlist may alternatively be communicated to a remote control 48 for the dedicated media player.

VIII. OVERVIEW OF ALLEGED PRIOR ART

A. Summary of United States Patent Application 2002/0087996

64. United States Patent Application 2002/0087996 to Bi *et al.*, "Bi," titled "Interactive Remote Control Of Audio Or Video Playback And Selections," discloses its system architecture in Figure 1, where we see in principal part a data server 102, a computing platform 100 (e.g., a PC which plays music or video via media cards 119, drivers 156, and music/video applications 151), and a navigator 260 (which is an "interactive remote control device").

65. Bi attempts to "provide a system which enables digital content, such as Internet-based or digital audio to be played, for example, on an analog radio without tying up a personal computer." (Bi at 0006). To that end, Bi discloses a remote control of an audio or video playback application running on a personal computer or other computing platform. (Bi at 0007)

66. The remote control of Bi (referred to as the "navigator 260" in Bi) is dedicated to the computing platform running on a personal computer. (Bove Tr., Ex. 2012, at 174:23-177:6 (Petitioner's expert, Dr. Bove, testifying that Bi's navigator communicates with an audio/video player application 151 running on computing platform 100; that Bi's navigator does not directly communicate with either the data server or the Internet and has to

direct the computing platform 100 to communicate with the data server or the Internet.))

67. Indeed, consistent with claim 1 of Bi, Bi's system comprises three components: a computing platform, a digital content player application, and a remote control:

> 1. A system for controlling playback of digital content, the system comprising:
>
> **a computing platform** including playback hardware for converting said digital content to audio signals for playback by an analog playback device;
>
> **a digital content player application**, resident on said computing platform, for playback of said digital content; and
>
> **a remote control device** for communicating with said computing platform over a predetermined communication link and controlling said digital content playback application.
>
> (Emphasis added)

68. The high-level architecture of Bi's system is shown in Figure 1, where we see in principal part a data server 102 containing digital audio or video data 103, Internet or other computer network 101, a computing platform 100 (e.g., a PC) which communicates with the data server 102 via the Internet 101 and runs an audio or video player application 151, and a navigator 260 (which is an "interactive remote control device"). Consistent with Dr. Bove's testimony and as shown in Fig. 1 of Bi, the navigator 260 communicates with the computing platform but cannot directly communicate with the data server 102. (Bove Tr., Ex. 2012 at 174:23-177:6)

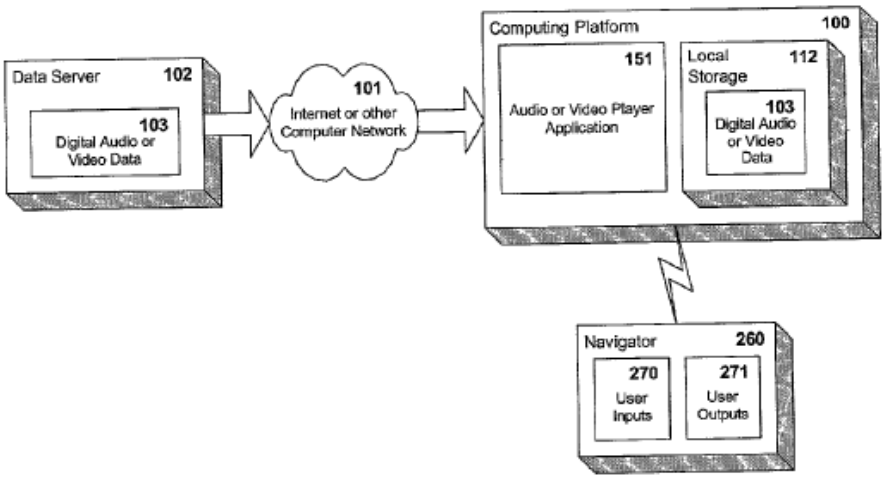

Figure 1

69. Bi discloses the computing platform 100 communicates with the navigator 260 via an audio or video player application 151 running

on a computing platform 100, where the communication "may be either wired or wireless." (Bi at 0018). The navigator control manager 154 running on the computing platform 100 takes user inputs (such as buttons, dials, and touch screens) from navigator user controls 264 via a wireless data communications interface 269. *See,* Fig. 2; (Bi at 0020) and (Bi at 0030).

70. The commands that the computing platform 100 can receive from the navigator 260, and the actions that the computing platform 100 can execute in response are shown in Figure 7 and disclosed in paragraphs (Bi at 0031) and (Bi at 0032). Likewise, the commands that the navigator can receive from the computing platform, and the actions that the navigator can execute in response, are shown in Figure 8 and disclosed in paragraphs (0033) and (0034) of Bi.

71. According to Figure 7, the navigator control manager 154 reads data sent from the navigator 260 and interprets the data as one of the following six commands:

(1) "play a music file" 177

(2) "download music file(s)" 181

(3) "buy music file" 184

(4) "browse music" 188

(5) "update software" 194

(6) "system start up" 196

72. With respect to the "play music file" command 177, if the navigator control manager 154 receives a "play a music file" command 177, it finds the "address of the music file" 178 and then it sends "information to the navigator 260 in step 179, such as the music title, the artist, and the album name for display", and then it starts step 180 consisting of "audio playback."

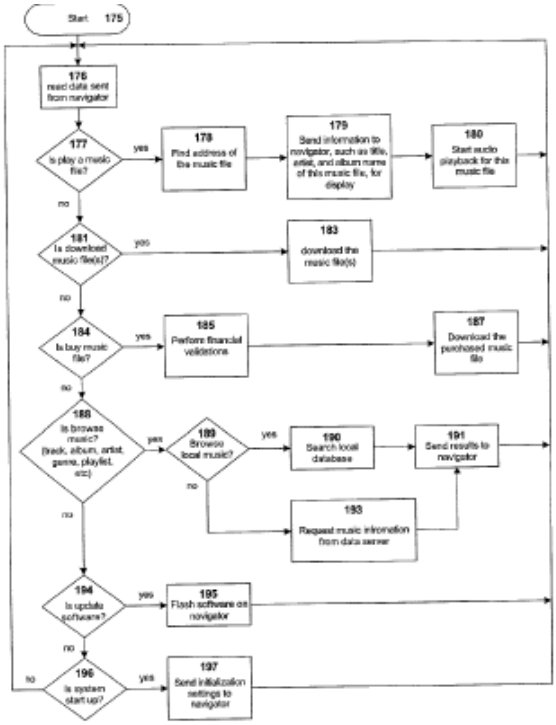

Figure 7

73. According to Figure 7, if the navigator control manager 154 running on the computing platform receives a "browse music" command 188, it looks to see if it is a command to "browse local music"; if yes, it searches local database 190 and then sends results to navigator 191; if no, it

requests music information from data server 193 and then sends results to the navigator. (Bi at [0032]).

74. Figure 5 of Bi shows the architecture of the navigator 260 (remote control). The navigator 260 contains a processor 261, a wireless data communications interface 269, and an IR transmitter 265, as well as other components as illustrated in Figure 5.

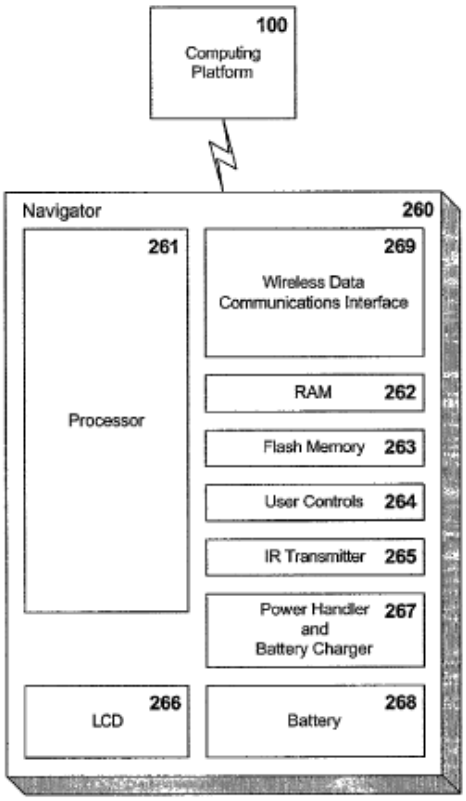

Figure 5

75. The processor 261 "handles the data communications with the wireless data communications interface 269… and takes user inputs 270 from the user controls 264, which are typically buttons and dials, and

sends this information to the wireless data communications interface 269 for wireless transmission to the computing platform 100 and eventually back to the audio or video player application 151 running on the computing platform 100." (Bi at [0028]).

76. The wireless data communications interface 269 could be "a Bluetooth, HomeRF, or IEEE 802.11 interface." (Bi at [0028]) The wireless data communications interface 269 on the navigator 260 is not capable of communicating directly with the Data Server 102 or the Internet 101. (Bove Tr., Ex. 2012, at 176:14-177:17, Dr. Bove agreeing that Bi discloses "only wireless data communication to computing platform 100") The navigator 260, therefore, is merely an extension of the computing platform 100, whose sole function is "*for communicating with said computing platform over a predetermined communication link and controlling said digital content playback application*." (Bi at claim 1)

B. Summary of International Patent Application WO 01/17142 to Gladwin

77. International application WO 01/17142 to Gladwin titled "Structure and Method for Selecting, Controlling and Sending Internet-Based or Local Digital Audio to an AM/FM Radio or Analog Amplifier" was published on March 8, 2001 ("Gladwin"). The Gladwin reference is directed

to a "system and method that allows a host PC to provide an analog audio signal for a radio or amplifier without interfering with the operation of the host PC." [Abstract, Summary of Invention at 2:30-3:5] As stated by Gladwin,

> "There is an ever-increasing amount of audio content available as digital computer files (such as in the MP3 format like those found at www.mp3.com) or as streaming digital audio (such as using the streaming digital audio techniques in US Patent 5579430). These new types of audio content can be played on a personal computer with a sound card, but cannot be played on a radio or stereo that is designed to receive and amplify analog audio signals. There are several techniques for converting a digital audio source to an analog signal that could be used by analog radio or amplifier, but these techniques interfere with the operation of the host PC and would require use of the PC to select and control the audio, for example, on an analog radio. Thus, there is a need to provide a system which enables Internet-based or digital audio to be played, for example, on an analog

radio without tying up a personal computer." (Gladwin, 2:17-27).

78. Thus, it is an object of Gladwin's invention to provide an adapter, via a general-purpose computer, to play digital audio files on analog devices, such as an AM/FM radio or analog stereo "without tying up a personal computer."

79. Gladwin's claims further illustrate the scope what Gladwin contemplated:

> 1. A system for converting audio digital data to audio analog data, said system including a host personal computer (PC), configured to receive predetermined digital data, the system comprising:
> a PC adapter configured to be operably connected to said PC adapter by way of a predetermined digital data bus, said PC adapter also configured to be connected to a remote analog device, and including means for receiving said digital audio data from said host PC and converting said digital audio data to analog audio data <u>for playback by an analog device</u> <u>without interfering with the operation of the host PC</u>. (emphasis added)

2. The system as recited in claim 1, wherein said analog device is located remotely from said PC adapter. (emphasis added)

3. The system as recited in claim 2, wherein said analog device is coupled to said PC adapter by way of a radio link. (emphasis added)

80. A person of ordinary skill in the art would understand Gladwin as teaching a system that enables Internet-based or digital audio to be played, for example, on an analog radio without tying up a personal computer.

81. To that end, as shown in Figure 1, Gladwin describes system 20 where the remote device 22 is connected via PC adapter 24 (using a USB connection) to a PC host 26, which in turn is connected to the Internet. The PC 26, however, is not a player device. Rather, the PC 26 sends digital audio data to the PC adapter 24, which electronically converts the digital data into analog data and broadcasts the data over the AM radio or stereo amplifier 28.

82. Importantly, in Gladwin, it is the PC 26 that obtains data from the Internet. The PC serves as a required intermediary for the remote device 22 and stereo amplifier device 28 to function. Neither the remote

device 22 nor the stereo amplifier 28 is connected to the Internet. The remote device 22 is connected to the PC adapter 24 over a two-way wireless connection, and is capable of providing information about available audio content to the user, which the user can select to be played. (Gladwin, at Fig. 3, p. 3:18-19). There is no disclosure in Gladwin that the remote device 22 is capable of connecting to the Internet. For the remote device 22 of Gladwin to be usable, it must be connected to the PC 26 via PC adapter 24.

83. The stereo amplifier 28 is connected to the PC adapter 24 and to the PC host via the USB connection. The stereo amplifier 28 is not integrated in the PC 26, as that would be contrary to the stated purpose of Gladwin's alleged invention. The stereo amplifier 28, however, is not capable of sending any information to the PC host 26 (via the PC Adapter 24) or to the remote device 22. (Gladwin at Fig. 1). There is no disclosure in Gladwin that the stereo amplifier 28 is capable of connecting to the Internet. Indeed, according to Figure 1, the stereo amplifier 28 has no capability to connect to the Internet.

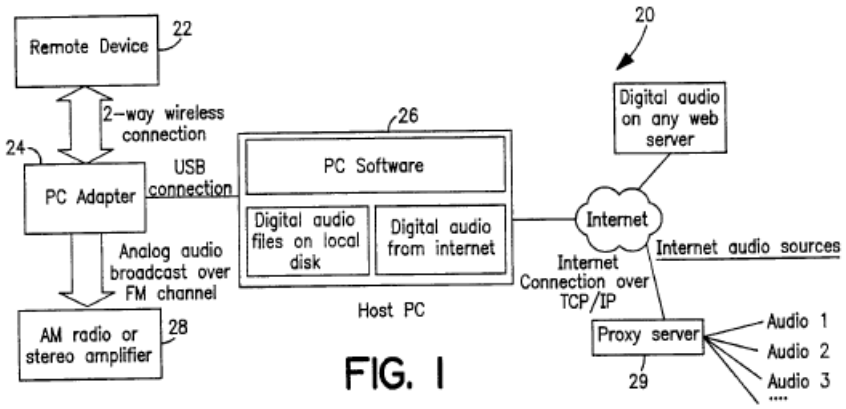

FIG. 1

C. Summary of U.S. Patent No. 6,502,194 to Berman

84. U.S. Patent 6,502,194 to Berman et al. ("Berman") titled "System for Playback of Network Audio Material on Demand" is directed to a playback unit that provides an interface between a remote server (e.g., Internet) and a conventional home audio system. (Berman at Abstract). The playback unit has a simple operating system that cannot be accessed by the user and is capable of retrieving audio data from a remote server and playing it "back in real time, using a home audio system, in response to user selection." (Berman at Abstract).

85. As shown in Figure 1 of Berman (below), the playback unit 100 includes a user interface and display component 112 containing "typical user-operable controls that might be found on a conventional home audio player that plays physical media, such as a CD player or a DAT player. These controls may include, for example, PLAY, STOP, FORWARD,

BACKWARD, PAUSE, TRACK, and SELECT buttons." [Berman, 5:20-29].

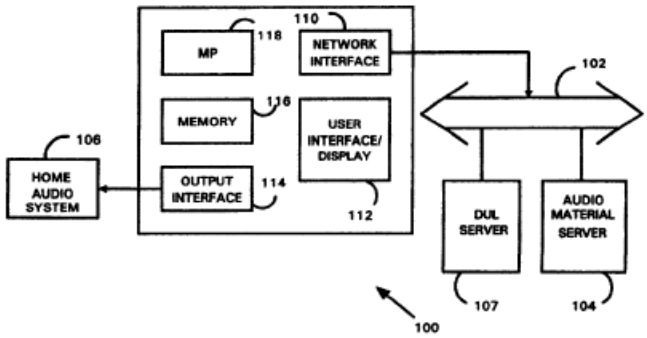

FIG. 1

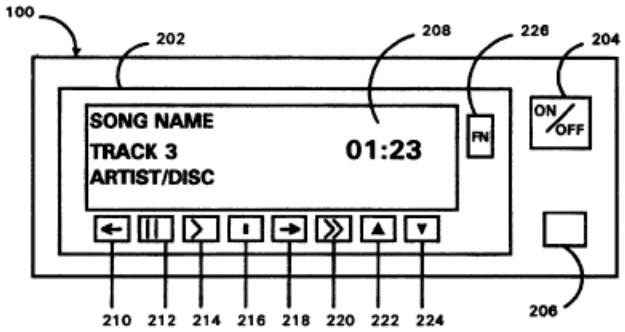

FIG. 2

86. Figure 2 illustrates a display interface containing a touch panel screen 202 of the playback unit 100. The display area 208 may display "a list of song[s] or selection name, track number, artist name or disc (compilation), and song playing time." (Berman at 5:42-53).

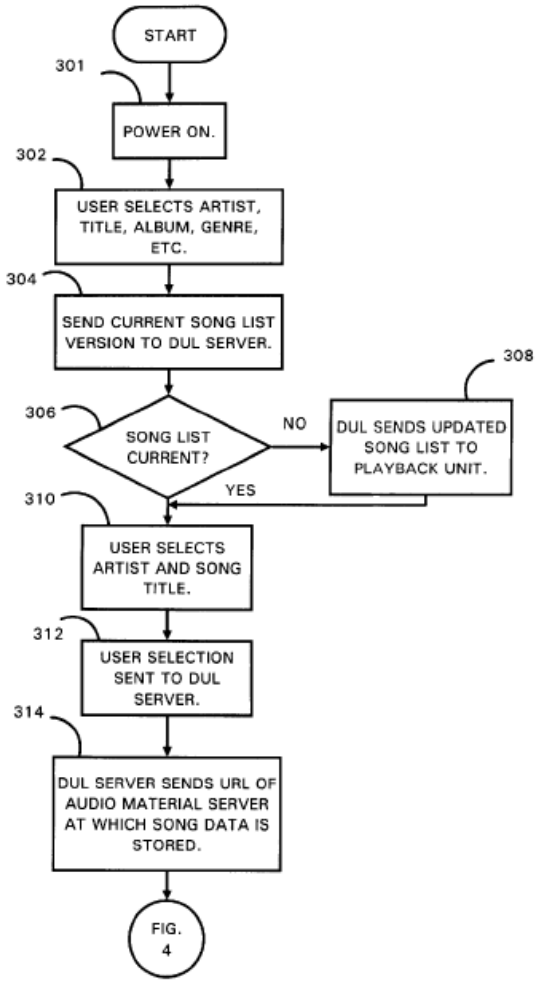

FIG. 3

87. Figure 3 shows the operating steps of the playback unit. In response to user commands, the system allows the user to browse for music by providing music categories such as artist, song, title, and music genre. The user selects a music category or type of song desired for playback from a list. (Berman at 6:50-7:4). The system updates the current song list based on the user's search criteria. (Berman at 7:14-19). The user is then permitted to select a track from among those available in a selection menu.

(Berman at 7:22-24). The playback unit sends the user requested song title information to the DUL (directory and user list server 107) server. The DUL server returns the network address for the requested song. (Berman at 7:30-33). Then, the playback unit retrieves the audio material from the network. (Berman at 7:34-36). Thereafter, the playback unit initiates communications with an appropriate audio material server to request the song from the appropriate directory. (Berman at 7:41-43). If the user has permission to download the song (Berman at 7:37-8:44, Figure 4), the playback unit retrieves the audio data and commences playing it as described in Figure 5 (Berman at 8:46-9:35).

88. The microprocessor 118 updates the user display, scans the user keypad buttons for actuation, scans any infrared receiver for user input, and downloads user-selected songs. (Berman at 8:45-9:34).

89. The playback unit 100 in Berman allows a user to record a program of track selections for playback in a programmed order. [(Berman at :6-15). For example, if a user wants to hear Song1, Song2, and Song3, the playback unit downloads packets for Song1, Song2, and Song3 into available buffers and processes the buffers for "listening." (Berman at 11:65-12:62).

90. The playback unit may also include an infrared sensor for receiving command signals from a remote control unit. (Berman at 5:46-49).

Berman discloses that the remote control can provide commonly used controls, which resemble those of a conventional multiple-disc CD player, including "disc select, play, fast forward, and the like." (Berman at 13:53-64). Berman indicates that "[t]hese controls, as well as the search functions, can be instantiations of objects that are part of the graphical user interface (GUI) of the user display." (Berman at 13:60-62). Berman further states that "[t]his GUI may be replicated on a remote control device, as indicated in FIG. 13." (Berman at 13:62-64).

IX. CLAIM 6 OF THE '099 PATENT IS NEITHER ANTICIPATED NOR OBVIOUS

91. Claim 6 of the '099 patent depends on Claim 1, and hence incorporates the limitations of Claim 1. Claim 1 of the '099 patent requires "receiving, at a wireless handheld remote control, a playlist from a remote source." Claim 6 further narrows Claim 1 by requiring that "the remote source is a central server." Thus, one of ordinary skill in the art would understand that Claim 6 requires that the wireless handheld remote receive a playlist from a central server. Further, one of ordinary skill would understand from the specification of the '099 patent that the central server is different and distinct from a media player device. Specifically, Figures 1 and 2 of the '099 patent show the server 11 and the media player 17 as separate

devices. Moreover, the '099 patent specifies that the media player 17 itself receives playlists from the server 11. ['099 at 8:10-64] As described in detail above, a wireless handheld remote control that is configured to communicate directly with a central server constituted a revolutionary advance in the timeframe of the '099 patent. A handheld device that is capable of communicating with media servers has come to have great relevance in our contemporary age of smart phones, wireless radio-based connectivity, and Internet media services, but was neither anticipated nor obvious in 2004.

A. Bi Does Not Anticipate Claim 6

92. The '099 patent "provides the ability for non-computer devices to display and play playlists from a central computer running on the Internet" ('099 at 10:61-63). Figure 2 of the '099 patent shows a central server 11 connected to the wireless remote 18 via the Internet 12 whereby the wireless remote 18 can receive a playlist directly from the server 11.

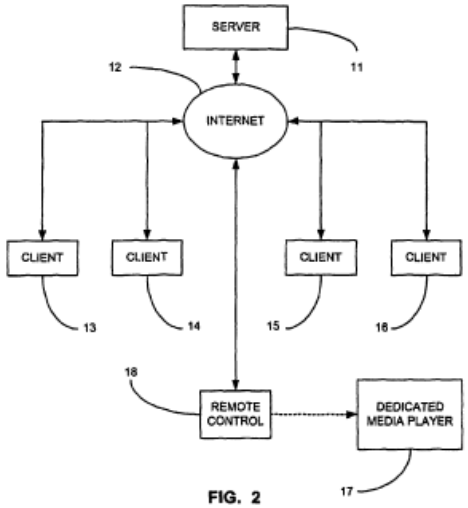

FIG. 2

93. The remote control/navigator 260 of Bi does not receive any data (let alone a playlist) from data server 102. That is so because in Bi, the data server 102 transmits data to the computing platform 100, which in turn communicates separately with the navigator 260. In other words, Bi's navigator 260 is not capable of communicating directly with the data server 102. As shown in Figure 1 of Bi below, the navigator 260 communicates only with the computing platform 100. Figure 7 of Bi reinforces Figure 1 in this regard because it shows that Bi's navigator control manager 154 on the computing platform 100 is responsible for all communications with the navigator 260 (Bi at 0032).

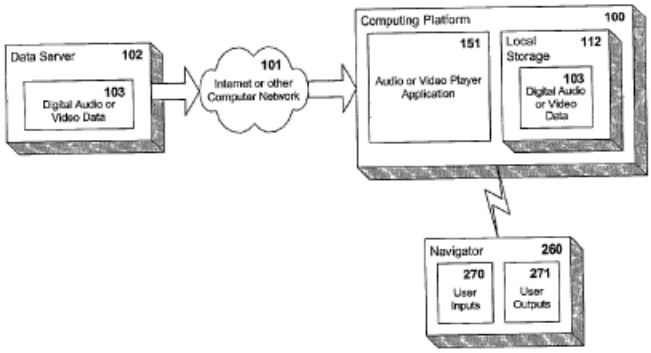

Figure 1

94. The Petitioner relies on Figure 1 and paragraphs [006], [007], and [0018] of Bi in support of its anticipation argument. It is my understanding that in order for a reference to anticipate, the alleged prior art

reference must disclose each and every limitation of the claim arranged or combined in the same way as in the claim. As stated above, since claim 6 depends from claim 1, it incorporates all limitations of claim 1. As such, claim 6 requires, among other things, that the wireless handheld remote control 18 receive a playlist from a central server 11. Bi does not disclose – including in Figure 1 and paragraphs [006], [007], and [0018] relied upon by the Petitioner – that the navigator 260 receives a playlist from data server 102. Indeed, Figure 1 contradicts any such reading of the Bi reference. Figure 1 clearly illustrates that the navigator 260 communicates only with the computing platform 100, which, in turn, communicates with the data server 102. One of ordinary skill in the art would understand that the computing platform 100 is not a central server. Bi, therefore, does not anticipate claim 6.

B. Gladwin does not anticipate Claim 6

95. The '099 patent "provides the ability for non-computer devices to display and play playlists from a central computer running on the Internet" ('099 at 10:61-63). Figure 2 of the '099 patent shows a central server 11 connected to the wireless remote 18 via the Internet 12 whereby the wireless remote 18 can receive a playlist directly from the server 11.

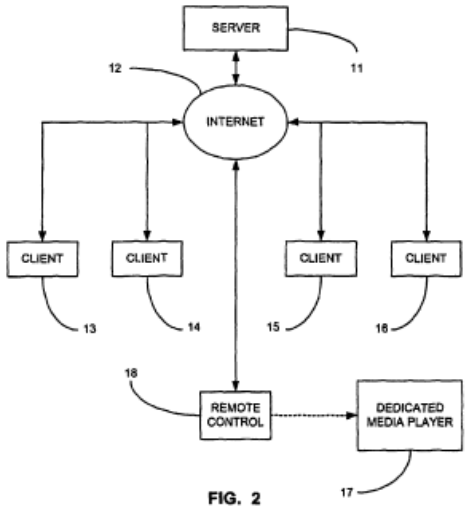

FIG. 2

96. For the same reasons as stated with respect to Bi, Gladwin does not anticipate claim 6. As shown in Figure 1 of Gladwin, the remote device 22 of Gladwin does not receive any data via the Internet — let alone a playlist — from any digital audio sources.

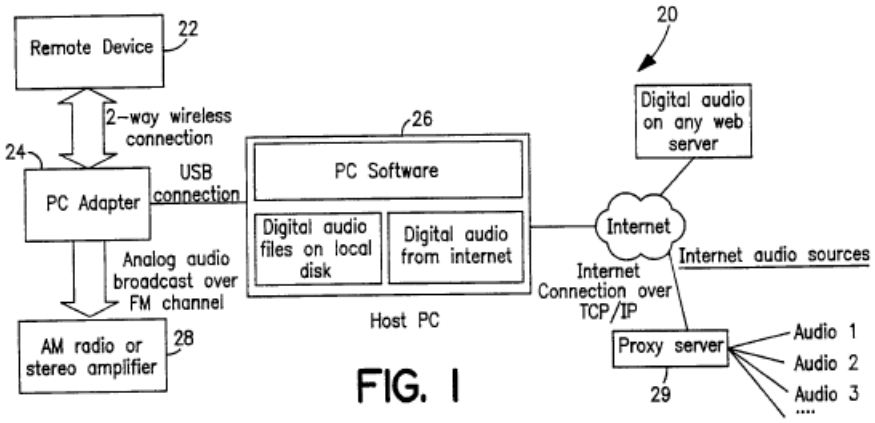

FIG. 1

97. Gladwin discloses that the remote device 22 receives a playlist from a PC 26 via the PC adapter 24. The remote device of Gladwin is tethered to the PC adapter 24 via a "2-way wireless connection." (Gladwin Fig. 1, 4:1-2). Gladwin describes the "Remote Device Manager" software

component of the Host PC 26, and states that, "This component sends playlist and other information to the remote device 22..." (Gladwin at Fig. 1; 5:14-16). Therefore, in Gladwin, it is the Host PC 26 that sends a playlist to the remote device 22, not a "central server" as claim 6 requires.

98. The remote device 22 of Gladwin is not connected to any digital audio sources. Rather, it is the PC host 26 in Gladwin that is connected to the Internet. As such, Gladwin does not disclose the claim limitation of claim 6 of "receiving, at a wireless handheld remote control, a playlist from a central server." Gladwin, therefore, does not anticipate claim 6.

C. Berman Does Not Render Claim 6 Obvious

99. I understand that the criterion for an obviousness analysis is whether the differences between a claimed invention and the prior art are such that the claimed invention as a whole would have been obvious to a person having ordinary skill in the art at the time of the invention in question.

100. As discussed above, the '099 patent "provides the ability for non-computer devices to display and play playlists from a central computer running on the Internet" ('099 at 10:61-63). Figure 2 of the '099 patent shows a central server 11 connected to the wireless remote 18 via the

Internet 12 whereby the wireless remote 18 can receive a playlist directly from the server 11.

101. Berman discloses that the playback unit may also include an infrared sensor for receiving command signals from a remote control unit. (Berman at 5:46-49). Berman states that the remote control unit can provide commonly used controls, which resemble those of a conventional multiple-disc CD player, including "disc select, play, fast forward, and the like." (Berman at13:53-64). Berman indicates that "[t]hese controls, as well as the search functions, can be instantiations of objects that are part of the graphical user interface (GUI) of the user display." (Berman at 13:60-62) Berman further states that "[t]his GUI may be replicated on a remote control device, as indicated in FIG. 13." (Berman at 13:62-64).

102. The remote control in Berman is, however, not capable of communicating via the Internet with a networked server, let alone receiving a playlist from such a server. Rather, Berman describes a remote control that provides "commonly used controls, which resemble those of a conventional multiple-disc CD player…" (Berman at13:53-64). There is, however, no suggestion in Berman of configuring the remote control so that it could communicate with a networked server. Even if one were to replicate the GUI

on the remote control unit of Berman, the remote control unit could only communicate with the playback unit.

103. Thus, in my opinion, Berman does not render obvious claim 6.

X. CLAIM 12 OF THE '099 PATENT IS NEITHER ANTICIPATED NOR OBVIOUS

104. Claim 12 is directed to a media player device that is connected to a remote source via a network and has a control system that can receive a playlist from the remote source and communicate the playlist from the media player device to a wireless handheld remote control that is separate from the media player device; the wireless handheld remote control further allows a user to select at least one item from the playlist for playback by the media player device.

A. Gladwin Does Not Anticipate Claim 12

105. As shown in Figure 1 of Gladwin, PC host 26 is not a media player device. The media player device in Gladwin is the AM/FM radio or stereo amplifier 28. The AM/FM radio or stereo amplifier 28 are not integral parts of the PC host 26, and the PC host 26 does not generate signals for transmitting audio data to the AM/FM radio or stereo amplifier 28. Rather, as discussed in more detail below, the PC adapter 24 "broadcasts

analog radio data to the AM/FM radio and stereo amplifier 28." [p. 3, line 28].

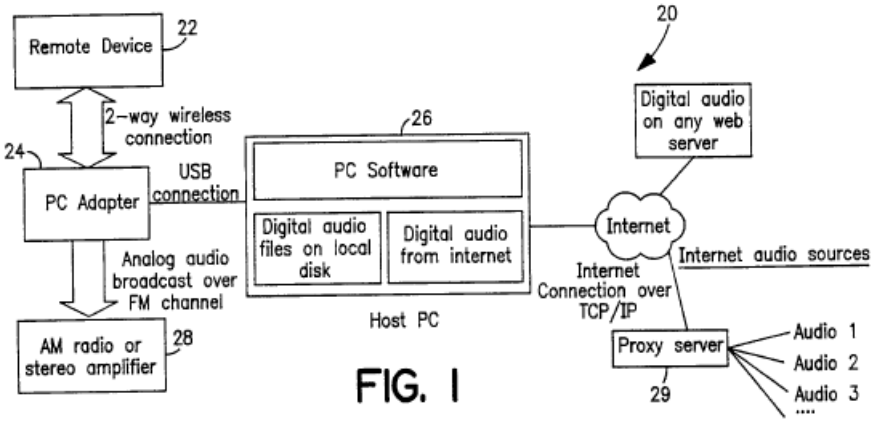

FIG. 1

106. Gladwin discloses receiving a playlist from a PC 26 via the PC adapter 24. The remote device of Gladwin is tethered to the PC adapter 24 via a "2-way wireless connection." (Gladwin at Fig. 1, 4:1-2) Gladwin describes the "Remote Device Manager" software component of the PC, and states: "This component sends playlist and other information to the remote device 22..." (Gladwin at Fig. 1, 5:14-16) The remote device 22 of Gladwin is not connected to any digital audio sources. Rather, it is the Host PC 26 in Gladwin that is connected to the Internet and to the analog audio – via the PC adapter 24 – such as the AM/FM radio or stereo amplifier 28.

107. The AM/FM radio or stereo amplifier 28 of Gladwin is not capable of receiving a playlist from the Internet or the Host PC 26. Therefore, Gladwin does not disclose a material limitation of claim 12 of a

media player having a control system that "receive[s] a playlist from the remote source."

108. Furthermore, the AM/FM radio or stereo amplifier 28 of Gladwin is not capable of communicating a playlist to the remote device 22. Therefore, Gladwin does not disclose the material limitation of claim 12 of a media player having a control system that "communicate[s] the playlist from the media player device to a wireless handheld remote control."

B. Bi Does Not Anticipate Claim 12

109. As shown in Figure 2 of Bi, which is reproduced below, Bi's system includes a computing platform 100 that supports an audio or video player application 151, which can receive digital audio or video data 103 from a data server 102 connected to the computing platform 100 through the Internet or other computer network 101. (Bi at 0023).

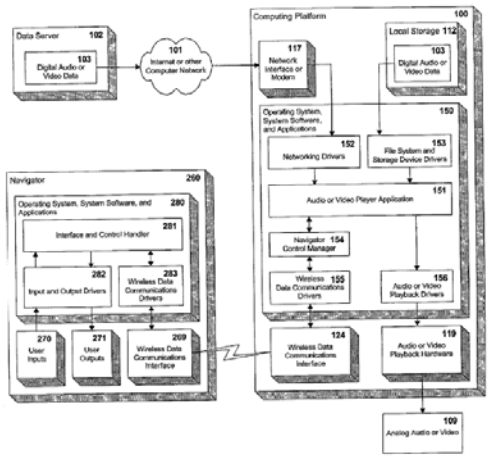

Figure 2

The audio or video player application 151 running on the computing platform 100 interacts with the navigator 260 through a wireless data communications interface 124 on the computing platform 100. *Id.* The navigator control manager 154 running on the computing platform 100 interprets and translates the user inputs 270 from the navigator 260 into commands for and control of the audio or video player application 151. The navigator control manager 154 running on the computing platform 100 also takes information from audio or video player application 151 and generates user outputs 271 for the navigator 260. *Id.* If the computing platform receives a "browse music command" from the navigator 260, the navigator control manager 154 checks if the music to browse is local to the computing platform 100. (Bi at 0032). If the music to browse is not local to the computing platform 100, the navigator control manager 154 requests music information from the data server 102 and sends the results of the local music browse to the navigator 260. *Id.*

110. Petitioner argues that Bi discloses receiving a playlist on the first device, which Petitioner takes to mean the navigator 260 of Bi. For support, Petitioner refers to the capability of Bi shown in Figure 7 and disclosed in paragraphs [0031] and [0032], where one of the commands that can be processed by the navigator control manager 154 is "browse music" in

diamond 188. In response to receipt of this command the navigator control manager executes the steps to the right of that diamond (189, 190, 191, and 193).

111. Bi does not, however, disclose that the computing platform 100 receives the browse results from the data server 102 in the form of a playlist, i.e., as a list of media items arranged to be played in a sequence. The relevant branch of the set of steps in Figure 7 of Bi is the one where the browse request is directed to a data server 193. Specifically in 191, the navigator control manager 154 will "Send results to navigator." At most, Bi discloses in Figure 7 that the criterion provided to a browse operation can be a playlist identifier, but a search criterion that identifies a playlist is not a playlist, it is just that: a search criterion. Even if a user can specify an attribute of a playlist as a browse criterion in step 188 of Bi Figure 7, a person of ordinary skill in the art understands that such a browse criterion is simply a pattern to be supplied to a search engine, and is not itself a playlist.

112. A person of ordinary skill in the art would further understand that the result of browsing in step 193 of Figure 7 is simply "music information," and Bi does not suggest that such "music information" is a playlist. For example, the "music information" resulting from a browse command could be in the form of album art, or liner notes, or concert

reviews, or advertising, or information allowing the user to purchase the music. Bi is silent on the meaning of "music information."

113. Bi also does not disclose that the computing platform 100 receives the browse results from the data server 102 in the form of a playlist, i.e., as a list of media items arranged to be played in a sequence.

114. To summarize, there is no disclosure anywhere in Bi of the disposition or processing of browse results. There is no disclosure that browse results take any specific form apart from the general notion of "music information" and "results". There is no disclosure that the browse results either constitute, or can be interpreted as, a playlist. Even if a user can specify an attribute of a playlist as a browse criterion in step 188 of Bi's Figure 7, a person of ordinary skill in the art would understand that Bi does not disclose the computing platform 100 receiving a playlist from the data server 102.

115. Finally, even if one assumes — despite Bi's silence to the contrary — that the navigator could somehow present the browse results as a playlist or playlists to the user, it is still not necessarily the case that the navigator would receive the "browse results" as a playlist from the computing platform 100. Indeed, Bi's step 191 in Figure 7 indicates only that that it will "Send results to navigator," which "results" a person of

ordinary skill in the art would understand to mean browse results, i.e., the result of the computer platform processing the browse command received from the navigator in step 188. However, even if such a person of ordinary skill in the art were to understand that the browse results could somehow be turned onto a playlist on the navigator itself (if it somehow had sufficient computer power and software to do so, which is not indicated) the navigator would still not be receiving a playlist. Therefore, Bi does not disclose, "receiving on the first device a playlist."

C. Berman Does Not Render Claim 12 Obvious

116. As discussed above, Berman's playback unit 100 receives audio material from one or more audio material servers 104 and provides it to a conventional home audio system 106 for playback. (Berman at 4:47-53). The user selects a music category or type of song desired for playback based on categories such as the artist, the song title, the album, and musical genres. In addition, the user may limit search results by confining the query to specific, user-defined categories. (Berman at 6:63-7:3). The playback unit sends the version of the current song list to the directory and user list DUL server 107 (Berman at 7:3-6), and the DUL server checks to determine if the received song list is current. (Berman at 7:14-15). If the song list is not current, the DUL server 107 sends an updated song list to the

playback unit 100. (Berman at 7:15-19). With a confirmed current song list, the user is permitted to select a track from among those available in a selection menu displayed on the display area of the interface depicted in Figure 2. (Berman at 7:22-24) The playback unit sends the user-requested song title information to the DUL server 107 (Berman at 7:32-33), and the DUL server returns the network address for the requested song. (Berman at 7:33-34). The playback unit sends the song request to the audio material server 104 and sends a user identification code and encrypted password information to the DUL server. (Berman at 7:55-59). If the DUL server 107 validates the ID information and the password, it sets a permission granted flag that is checked by the audio material server 104. (Berman at 7:63-66). If the permission granted flag indicates that the user has been granted permission to download the requested song, the audio material server transmits the audio material to the playback unit. (Berman at 8:28-34).

117. The playback unit in Berman does not receive a playlist from the DUL server. Rather, as discussed above, the DUL server sends an updated song list to the playback unit if — and only if — the DUL server determines that the current song list on the playback unit is not current. The updated song list that may or may not be sent by the DUL server to the playback unit is not a playlist. Rather, it is simply a collection of references

to songs that should be updated by Berman's playback unit. In other words, the song list that may or may not be sent by the DUL server to the playback unit is a list of media items (songs) that the audio material server wants the playback unit to add or update in its database. This is not a list of media items (songs) that are arranged to be played, and it is certainly not a list of media items (songs) that are arranged to be played in a sequence. Rather, it is a data structure used to update the current song list in a database so as to synchronize the playback unit's table of contents with that of the audio material server.

In addition, Berman does not disclose a handheld remote control that can operate independently of the playback unit. Berman discloses that a user can employ the user display interface on the playback unit to carry out the searching of available audio material. (Berman at 13:51-53). Berman further indicates that the most commonly used controls of the playback unit closely resemble those of a conventional multiple-disc CD player, including disc select, play, fast forward, and the like, where these controls, as well as the search functions, can be instantiations of objects that are part of the graphical user interface (GUI) of the user display. (Berman at 13:56-62) Berman states that this GUI "may be replicated on a remote control device" but offers the person of ordinary skill in the art no guidance beyond this

vague handwaive. (Berman at 13:62-64). Berman contemplates the use of an infrared (IR) remote control that can send commands to the playback unit, where an IR sensor 206 in the playback unit receives the command signals. (Berman at 5:46-49) It is clear that Berman conceives of his remote control as conventional, in line with the conventional thinking of his day. By suggesting conventional CD player controls, and only suggesting in the vaguest terms that the GUI can be replicated on the remote control, it is clear that Berman's remote — like other conventional remotes of his day — is a slave to, and cannot function apart from, his playback unit.

118. Nowhere in Berman is there any teaching or suggestion that the remote control would be able to operate independently of the playback unit. For example, Berman does not teach or suggest that the remote control has a dedicated processor, i.e., one that is independent of the playback unit's processor, for controlling the internal operations of the remote control. Berman does not teach that the remote control has a memory that can store playlists or songs. Berman does not teach that the remote control contains network-enabling technology such as a Bluetooth or Wi-Fi transceiver that would facilitate direct communications with the audio material server. Berman's primitive remote control has only a link to the playback unit via an "infrared sensor 206, for receiving signals from a remote

control (not illustrated)." As such, there would be no need to configure the remote control in Berman to operate as an independent device, e.g., by providing the remote control with its own dedicated processor, memory and associated components.

119. Further, as discussed above, it was well known to a person having ordinary skill in the art in the timeframe of the'099 patent, consumer IR technology (CIR) introduced, as Dr. Bove points out (Bove Decl., ¶14) in the 1980's, was designed for low-cost, unidirectional, low-bandwidth remote control applications such as from a handheld remote control to a consumer electronics device such as a TV or CD player, and was not designed to provide the throughput and data accuracy required to support reliable data transfer, beyond the transfer of simple command signals, from a dedicated remote control to associated consumer electronics devices. (http://www.phidgets.com/docs/IR_Remote_Control_Primer; "IR Remote Control Primer - Phidgets Support.pdf"); Ex. 2015. Use of IR technology for data transfer poses a number of challenges, such as limited bandwidth, and degradation or loss of signal due to light pollution or occlusion. (http://www.phidgets.com/docs/IR_Remote_Control_Primer; "IR Remote Control Primer - Phidgets Support.pdf"); Ex. 2015. As a consequence, CIR has found no place in consumer electronics applications for bidirectional

communications. Indeed, Dr. Bove testified that he was not aware of any infrared remote (CIR) controls in 2004 that had bidirectional communication with player devices. (Bove Tr., Ex. 2012, at 130:7-12).

120. One of ordinary skill in the art would know that the IrDA protocol was developed in 1993 to provide for data transfer over infrared for communications, e.g., between a personal computer and an IrDA mouse or keyboard. (irda.com; "Welcome to IrDA.pdf"); Ex. 2017 [http://en.wikipedia.org/wiki/Infrared_Data_Association; "Infrared Data Association - Wikipedia, the free encyclopedia.pdf"); Ex. 2018 But IrDA technology requires IR transmitter and sensor to be within a meter or less and are subject to the same line-of-sight restrictions as CIR devices. (http://en.wikipedia.org/wiki/Infrared_Data_Association, Range: standard: 1 m; "Infrared Data Association - Wikipedia, the free encyclopedia.pdf"); Ex. 2018 (http://kurser.iha.dk/eit/dtm3/IrDA/intro4.pdf; "The IrDA Standards for High Speed Infrared Communications.pdf" page 2); Ex. 2027.

121. In his deposition, Dr. Bove, was asked whether one of ordinary skill in the art could implement the replication of Berman's GUI on its remote control without undue experimentation. He responded "it would be essentially off-the-shelf as of 2004." (Bove Tv., Ex. 20112 at. p. 284, 2-3)

122. I disagree with Dr. Bove's opinion that the GUI in Berman could have been replicated on its remote control without undue experimentation as of 2004. A person of ordinary skill in the art would have faced at least the following difficulties replicating Berman's GUI on its remote control. I believe a person of ordinary skill in the art would not have been able to overcome these difficulties without undue experimentation. Berman discloses that the playback unit may include an "infrared sensor 206" (Berman at 5:46-48). Though Berman's playback unit does not include a corresponding infrared transmitter to beam information back to the remote control, a person of ordinary skill in the art would understand that such a back-link would be required in order to send graphics data to Berman's GUI on the remote control. However, a person of ordinary skill in the art would understand that an infrared link could not reliably replicate the playback unit's graphical data on the remote GUI because of the limitations of infrared technology described above.

123. The infrared technology available for consumer electronics products such as Berman's as of 2004 (and even up to the present), called "consumer infrared", or CIR, was neither designed nor able to support reliable communication of computer data, but this would clearly be required if the remote GUI were to accurately replicate the graphical

information displayed on Berman's playback unit. It was well known as of 2004 that CIR technology was subject to light interference and blockage from obstructions, and therefore must operate line-of-sight, at slow speed, and at close range in order to reliably transmit even simple commands like "Play" and "Stop" to a TV or CD player across a room. (CIR technology continues to have these limitations today).

(http://www.phidgets.com/docs/IR_Remote_Control_Primer; "IR Remote Control Primer - Phidgets Support.pdf"); Ex. 2016 A person of ordinary skill in the art would have known that CIR would not be suited for Berman's back-link at least because light interference or blockage would corrupt the GUI data. In order to reliably replicate Berman's GUI on its remote control, a person of ordinary skill would have had to devise a communications protocol that could reliably transfer infrared data from the playback unit to the remote control. Such a communications protocol would have had to solve the difficulties inherent in infrared transmission of data, including the light interference problems noted above. Dr. Bove alluded in his deposition to IrDA technology and asserted that bidirectional infrared communication standards like IrDA were well known. (Bove Tv. at. p. 250:12-254:4) He further asserted that he believed that at the time Apple laptops and a number of other commercial products incorporated IrDA technology as a digital

infrared communications link. (Bove Tv. at. 250:16-251:3) But it was well known to persons of ordinary skill in the art at the time that IrDA was designed to communicate over a distance of no more than one meter. (http://en.wikipedia.org/wiki/Infrared_Data_Association: "Range: standard: 1 m" ; "Infrared Data Association - Wikipedia, the free encyclopedia.pdf"); Ex. 2028 However, a person of ordinary skill in the art would have known that a remote control with a range of only three feet from Berman's playback unit would have no practical advantage, because the person using the remote control would have to be within arms-length of the playback unit, and the user could just as easily use the GUI on the playback unit instead, obviating the reason for having a GUI on the remote. Therefore, the person of ordinary skill in the art would realize that no extant infrared technology could solve the problem Berman posed, thereby requiring undue experimentation.

XI. CLAIM 2 OF THE '099 PATENT IS NEITHER ANTICIPATED NOR OBVIOUS

124. Claim 2 of the '099 patent depends on Claim 1, and hence incorporates the limitations of Claim 1. Claim 1 of the '099 patent requires "receiving, at a wireless handheld remote control, a playlist from a remote source." Claim 2 further recites that the playlist is further communicated from the remote source to the media player.

125. One of ordinary skill in the art will understand that the remote source in claim 2 is distinct from the media player, as Claim 2 requires that the playlist be communicated from the remote source to the media player.

A. Bi Does Not Anticipate Claim 2

126. The navigator 260 in Bi receives "browse results" from the computing platform 100. The computing platform 100 is not, however, the remote source recited in Claim 2. This is so because the remote source and the media player recited in Claim 2 are distinct devices. The computing platform 100 functions as a media player and hence cannot be the remote source recited in Claim 2. Moreover, the "browse results" in Bi is not a playlist. Specifically, there is no indication in Bi that the browse results in Bi are arranged to be played in a sequence.

B. Gladwin Does Not Anticipate Claim 2

127. For the same reasons described above with respect to claim 12, Gladwin does not anticipate dependent claim 2 since Gladwin does not disclose sending a playlist from the remote source (e.g., a server accessible via the Internet) to the media player device as required by claim 2. That is so because the media player device of Gladwin (i.e., AM/FM radio or stereo amplifier 28) is not capable of receiving a playlist.

C. Berman Does Not Render Claim 2 Obvious

128. The remote control in Berman does not receive a playlist from a remote source that is distinct from the playback unit. In fact, the remote control in Berman is not capable of communicating with such a remote source, let alone receiving a playlist from it. Rather, the remote control is configured for primitive communication with the playback unit, e.g., sending conventional commands, such as play, fast forward, and the like, to the playback unit.

129. Moreover, there is no suggestion in Berman for modifying the remote control such that it would be capable of communicating with a remote source, e.g., an audio server, to receive media for that server.

XII. CLAIM 10 OF THE '099 PATENT IS NOT ANTICIPATED

A. Bi Does Not Anticipate Claim 10

130. Claim 10 of the '099 patent provides a "wireless handheld remote control," which includes "a communication interface communicatively coupling the wireless handheld remote control to a remote source via a network." The wireless handheld remote control further includes "a control system associated with the communication interface and adapted to: receive a playlist from the remote source; and present the playlist to a first

user associated with the wireless handheld remote control such the first user is enabled to select at least one item from the playlist for playback by a media player device which is associated with and separate from the wireless handheld remote control."

131. The navigator 260 in Bi does not receive a playlist from the computing platform 100. As discussed above, the "browse results" in Bi are not a playlist, i.e., a list of media items arranged to be played in a sequence. Nor does Bi disclose that the navigator 260 presents a playlist to a user such that the user can select at least one item from the playlist for playback. A person of ordinary skill in the art would understand that the result of browsing in Bi step 193 of Figure 7 is simply — as stated — "music information," and Bi does not suggest that such "music information" is a playlist. For example, the "music information" resulting from a browse command could be in the form of album art, or liner notes, or concert reviews, or advertising, or information allowing the user to purchase the music. Bi is silent on the meaning of "music information." Apart from saying that the "results" are sent "to the navigator 260 in step 191" (Bi at 0032), Bi is silent about what constitutes browse "results," or what the navigator is expected to do with them, should it receive them (which is not indicated).

132. One of ordinary skill in the art would understand that the term "music information" is a generic term, and the music information sent by the data server 102 to the computing platform 100 is not necessarily in the form of a playlist. Rather, the music information can be in a variety of different forms, such as album art, liner notes, concert review, advertising, etc.

XIII. CLAIM 11 OF THE '099 PATENT IS NEITHER ANTICIPATED NOR OBVIOUS

133. Claim 11 of the '099 patent is directed to a method that includes receiving, at a media player device, a playlist from a remote source, and communicating the playlist from the media player device to a wireless handheld remote control associated with and separate from the media player device, wherein, at the wireless handheld remote control, the playlist is presented to a first user associated with the wireless handheld remote control and used by the first user to select at least one item from the playlist for playback by the media player device.

A. Bi Does Not Anticipate Claim 11

134. Claim 11 of the '099 patent is directed to a method that includes receiving, at a media player device, a playlist from a remote source, and communicating the playlist from the media player device to a wireless

handheld remote control associated with and separate from the media player device, wherein, at the wireless handheld remote control, the playlist is presented to a first user associated with the wireless handheld remote control and used by the first user to select at least one item from the playlist for playback by the media player device.

135. Bi does not disclose that the computing platform 100 receives the browse results from the data server 102 in the form of a playlist, i.e., a list of media items arranged to be played in a sequence. Further, Bi does not disclose that the computing platform 100 communicates the browse results in the form of a playlist to the navigator 260. In addition, there is no indication in Bi that the navigator 260 presents the browse results as a playlist to a user.

B. Gladwin Does Not Anticipate Claim 11

136. As discussed above in connection with Claim 12, the PC host 26 in Gladwin is not a media player device. The media player device in Gladwin is the AM/FM radio or stereo amplifier 28. The AM/FM radio or stereo amplifier 28 of Gladwin is not capable of receiving a playlist from the Internet or the PC host 26. Therefore, Gladwin does not disclose a material limitation of claim 12 of "receiving, at a media player device, a playlist from a remote source."

137. Furthermore, the AM/FM radio or stereo amplifier 28 of Gladwin is not capable of communicating a playlist to the remote device 22. Therefore, Gladwin does not disclose another material limitation of claim 11 of "communicating the playlist from the media player device to a wireless handheld remote control …"

C. Berman Does Not Render Claim 11 Obvious

138. As discussed above, the playback unit in Berman does not receive a playlist from the DUL server. Rather, the DUL server sends an updated song list to the playback unit if the DUL server determines that the current song list on the playback unit is not current. The updated song list sent by the DUL server to the playback unit is not a playlist. Rather, it is simply a collection of references to songs to update the internal database of the playback unit. In other words, the song list sent by the DUL server to the playback unit is a list of media items (songs) that the audio material server wants the playback unit to add or update. This is not a list of media items (songs) that are arranged to be played, and it is certainly not a list of media items (songs) that are arranged to be played in a sequence. Rather, it is a data structure used to update the database so as to synchronize the playback unit's table of contents with that of the audio material server.

139. Further, as discussed in detail above in connection with Claim 12, Berman does not disclose a handheld remote control that can operate independently of the playback unit. In other words, Berman does not provide a handheld remote control that is separate from the playback unit. Moreover, as discussed in detail above, one of ordinary skill in the art would have found no reason to configure the remote control in Berman as a separate device relative to the playback unit.

140. All of the statements made in this declaration of my own knowledge are true and all statements made on information and belied are believed to be true. These statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code.

Dated: June 13, 2014 Signature: Gareth Loy

Gareth Loy, D.M.A

EXHIBIT A

Gareth Loy Curriculum Vitae

Curriculum Vitae

Dr. Gareth Loy, DMA
Stanford, 1980

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Professional Summary

Dr. Loy has over 36 years of academic and professional experience in computer science, software development, embedded systems, networking, enterprise software systems, digital audio signal processing, and music technology. His practice encompasses a wide range of computer technology disciplines.

His doctorate is from Stanford, 1980, where he studied under Dr. John Chowning at the Stanford Artificial Intelligence Laboratory and the Center for Computer Research in Music and Acoustics.

He has published widely in various juried journals, and has authored three books with the MIT Press, including *Musimathcs*, a two-volume text on the mathematics of music, and *Music and Connectionism*, a collection of articles on artificial neural networks and music research.

He was a Researcher and a Lecturer for graduate and undergraduate courses in computer science and digital audio at UCSD for a decade, cofounded the Computer Audio Research Laboratory, conducted computer systems research, and built numerous other computer laboratories there.

He has been Software Architect for consumer and professional products for large international electronics companies, and has sustained a long and successful career at the cutting edge of software development and design using multiprocessor/multi-core architectures for signal processing and control.

Dr. Loy has over sixteen years of experience as an expert witness on numerous cases. He has testified before the International Trade Commission, and before a jury in Federal Court, has testified at Markman claim construction hearings, been deposed numerous times, authored numerous reports and declarations, and has presented exhibits and Markman tutorials in Federal Court. Case types include patent litigation, trademark infringement, copyright litigation, and inequitable conduct. He has worked on complex international patent cases, and has provided expertise on such diverse areas as compilers, file systems, operating systems, handheld networked Personal Information Management (PIM) devices, enterprise email systems, software for factory automation systems, interactive databases, enterprise software for management of music libraries, MPEG audio compression, on-line gaming, composition systems, digital

camera hardware and software, digital audio hardware and software technologies, and more. (See the Summary of Testifying Experience.)

Expertise

- Large Scale Software Architecture/Analysis in C, C++, ObjectiveC, Java, etc.
- Mobile phones, mobile computing, cell phones, digital cameras, PDAs, iPhone, iPad, etc.
- Software Architecture for consumer and professional computer products
- Internet commerce
- User interfaces, design, architecture
- Enterprise applications and databases
- Networked file systems
- Operating systems
- File backup/restore and archiving
- Real-time and parallel processing systems
- Enterprise networked systems
- Digital Audio Signal Processing and Acoustics
- MP3, MPEG, Audio Compression Standards
- Music Technology

Education

Year	College or University	Degree
1980	Stanford University	DMA – Doctor of Musical Arts in digital audio technology: computer science, digital signal processing (DSP), digital audio, computer systems for audio, real-time systems for music, music composition. Thesis research conducted at the Stanford Artificial Intelligence Laboratory (SAIL), and the Center for Computer Research in Music and Acoustics (CCRMA). Thesis: compiler for Systems Concepts Digital Synthesizer + award-winning composition *Nekyia*. Foundational research in digital audio that led to hardware and software systems to compute digital audio in real time.
1975	San Francisco State University	B.A., Music/Music Technology

Projects and Skills

- 35+ years experience as a C/C++/ObjectiveC/Java software engineer, software systems architect
- Early Apple employee (1979)
- Lecturer and researcher for a decade at UCSD
- Architected numerous large-scale enterprise software and hardware systems
- Developed and debugged prototype multiprocessor systems, real-time systems, embedded systems, file systems
- Wrote assemblers, compilers, linkers/loaders

- Created hundreds of user-level applications on numerous platforms
- Built home entertainment systems, professional audio recording systems
- Designed, developed and implemented embedded systems for handheld applications
- Direction and management of research and software development projects
- Digital audio signal processing, systems software for custom computing platforms
- Parallel-processing systems software
- Operating systems: PC, UNIX, Mac, Windows, Developer Studio, LINUX, VxWorks, and WindRiver platforms
- Computer programming language development with yacc and lex
- Real-time programming with VxWorks
- Systems programming, device drivers, file systems, systems administration
- Multiprocessor systems programming
- Multimedia computing
- Design, debug, and document complex processor Instruction Set Architectures
- Build automatic document generation systems that create finished documents directly from commented code sources, or create instruction set architecture documents directly from machine description files.
- Design, comprehend, and document software, hardware, and VLSI architectures.
- Collaborate with designers to patent intellectual property, review patents for applicability, and drive the review process with the US Patent Office.

Professional Experience

From: 1998
To: Present
Organization: Gareth, Inc., Corte Madera (Marin County), CA.
Title: President
Summary: Provide software and hardware engineering, and litigation support to high-technology companies, internationally.

From: 2003
To: 2004
Organization: Sony Corporation of America
Title: Software Architect, Super Audio CD Project
Summary:
- Developed 48-track pro-audio recording system for authoring next-generation audio media, including SACD/DSD audio discs, DVD, and Blu-Ray discs.
- System included synchronous Internet transmission of digital audio, custom hardware interfacing, complex user interface design, real-time operating systems (VxWorks), code development in C++, interfacing to traditional recording devices.
- Improved system design to meet project goals
- Met aggressive project deadlines.
- Manager: Ethan Grossman (currently at Digidesign)

From: 1994
To: 1998
Organization: Chromatic Research, Inc.
Summary: Senior Information Engineer
1997-1998:
- Wrote hardware architecture documentation for next-generation multi-media

processor
- Wrote software API reference documentation for multi-media processor

Senior Digital Audio Engineer

1994-1997:
- Reverse-engineered popular FM synthesis chip, and reduced it to software simulation running on Mpact processor
- Reviewed extensive music synthesis patent law, advised on patent protection strategies and work-arounds to patented signal-processing technologies.
- Led wave-table synthesis project, hired & managed voicers, licensed sound libraries, specified the synthesis architecture, interfaced between marketing, engineering and voicers
- Represented Chromatic at the MMA's IASIG 3DWG (3D audio industry group of the MIDI Manufacturer's Association)
- Spearheaded the successful effort to open Microsoft's 3D audio API to hardware acceleration
- Consulted on 3D audio subsystem design

From: 1994
To: 1994
Organization: Sonic Solutions; Novato, CA
Title: Senior Digital Audio Engineer
Summary: Specified, architected, and implemented track-based recording system for automatic dialog replacement (ADR) and Foley, involving user interface design, new core functionality for rapidly capturing and easily comparing multiple session takes.

From: 1988
To: 1993
Organization: Frox, Inc., Milpitas, CA
Title: Digital Audio Systems Architect and Project Lead
Summary:
- Member of VLSI design team that developed a custom stream-oriented move engine that linked an array of up to 16 Motorola 56000's, operating synchronously at the instruction and sample level. Features included subsampling, 24x24 AES-EBU serial link I/O, and both asynchronous parameter update and synchronous data movement to/from a host computer
- Debugged brass-board and ASIC implementation of move-engine with architects.
- Designed and implemented the user interface, system model, and control system for a parallel-processing multiple-DSP audio subsystem
- Developed user interface for audio system based on proprietary Frox "wand" remote controller.
- Implemented Lucasfilm THX processing, Dolby ProLogic, concert hall simulation and other forms of audio processing
- Wrote marketing documentation, white papers, delivered papers at conferences (AES and ICMA), and wrote support documentation
- The FroxSystem received the Industrial Design Excellence Award (IDEA) Bronze Award for excellence in User Interface Design; Popular Science Magazine's Best of What's New Award for Audio and Video Products, AudioVideo Magazine's Grand Prix Award, CES/EIA Innovations '93 Award

From: 1980
To: 1989
Organization: University of California, San Diego, CA
Concurrent appointments: Computer Audio Research Laboratory, Center for Music Experiment, UCSD Music Department
Title: Researcher, Lecturer, Administrator, with concurrent appointment as Director of Research at the Computer Audio Research Laboratory (CARL), part of the Center for Music Experiment (CME), an Organized Research Unit (ORU) of the University of California, San Diego (UCSD)
Summary:

- Lecturer in graduate computer music sequence: principles and practice of digital audio and computer science, and undergraduate musical acoustics, and electronic music
- Conducted original research in computer architectures and software for digital signal processing of music and musical performance
- Wrote numerous scholarly articles for various publications on original research topics
- Responsible for development and distribution of the CARL Software Distribution, a collection of research software developed at CARL for use at collaborating sites
- Supervised staff and research assistants, directed projects in digital interfaces for music instrument gesture capture, digital audio, signal processing
- Designed, specified, and installed computing laboratories and instructional facilities

From: 1979
To: 1980
Organization: Apple Computer, Inc., Cupertino, CA
Title: Technical writer
Summary:

- Wrote user manuals for the original Apple II: Fortran, Basic, text editing
- Developed Apple's first self-documenting text editing paradigm
- Worked with Jef Raskin (my boss) on the very earliest research platforms that would eventually become the Macintosh computer. Raskin worked directly for Steve Jobs.

From: 1974
To: 1975
Organization: San Francisco State University
Title: Lecturer
Summary:

- While still a graduate student, I was appointed to be a Lecturer by the Music Department to replace faculty on sabbatical.
- I taught electronic music theory and practice.

Litigation Support Experience

Summary of Testifying Experience:

- **21 cases** as Testifying Expert, Expert of Record
- **27 total cases** to date
- **Trial testimony**
  - 2014: ITC: Black Hills Media LLC v. Samsung, et al., patent litigation
    - Two days of testimony under oath
  - 1995: Industrial Indemnity Co. v. Apple Computer, Inc., trademark infringement
    - Three days of testimony under oath
- **Markman Claim Construction hearings**
  - 2011: Gibson v. 745 (Seven45) LLC, patent infringement
  - 2011: MONKEYmedia Inc. v. Apple, Inc., patent infringement
  - 2011: MONKEYmedia Inc. v. Disney, Inc. et al., patent infringement
- **Markman tutorials**
  - 2004: Seer Systems, Inc. v. Beatnick, Inc. & Microsoft Inc., patent infringement
- **Depositions**
  - 2013: ITC: Black Hills Media v. Samsung, LG, Panasonic, Toshiba
    - 4.5 days of deposition
  - 2012: MobileMedia Ideas LLC v. Apple
  - 2011: Gibson Guitar Corp. v. 745 LLC
  - 2011: MONKEYmedia Inc. v. Apple
  - 2011: MONKEYmedia Inc. v. Disney et al.
  - 2009: 1st Media. v. Electronic Arts, inequitable conduct
  - 2004: Seer Systems, Inc. v. Beatnick, Inc. & Microsoft Inc., patent infringement
  - 1995: Industrial Indemnity Co. v. Apple Computer, Inc., trademark infringement

Expert Engagement:

Type of Matter:	Patent litigation before International Trade Commission
Law Firm:	Mintz Levin
Case Name:	"In the Matter of certain digital media devices, including televisions, Blu-Ray disc players, home theater systems, tablets and mobile phones, components thereof and associated software, DN 2954. Filed with the ITC." Complainant Black Hills Media, LLC alleges violations of section 337 of the Tariff Act of 1930 (19 U.S.C. 1337).
Complaintant:	Black Hills Media, LLC
Respondents:	Samsung, LG, Panasonic, Toshiba, Sharp
Patents at issue:	• 8,214,873 — Method, system, and computer-readable medium for employing a first device to direct a networked audio device to render a playlist • 8,028,323 — Method and system for employing a first device to direct a networked audio device to obtain a media item • 8,230,099 — System and method for sharing playlists
Services Provided:	**Testifying expert** for infringement and validity, for complainant Black Hills Media, LLC. Two days testimony at ITC hearing in February 2014; 4.5 days of deposition; expert reports on infringement and validity; witness statements on infringement and validity, product testing, wireshark internet packet analysis; source code analysis.

Disposition:	Ongoing
Date:	2013 –
Contact:	James Conley (858) 314-1500, Howard Wisnia (858) 314-1500, Joe Hameline (617) 348-1651.

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	Desmarais LLP
Case Name:	MobileMedia Ideas LLC v. HTC Corp. and HTC America, Inc., Case 2:10-cv-00112-DF (2:2010cv00112), Eastern District of Texas. Judge Folsom.
Services Provided:	**Testifying expert** for **plaintiff Mobile Media Ideas** (**MMI)** for infringement and validity.
Patents at issue:	• 5,490,170 — Coding apparatus for digital signal
Disposition:	Settled
Date:	2011 – 2013
Contact:	Laurie Stempler, 212-351-3423

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	Proskauer Rose
Case Name:	MobileMedia Ideas LLC v. Apple Inc., Case 1:10-cv-00258-SLR-MPT (1:2010cv00258), Wilmington Delaware, Judge Robinson.
Patents at issue:	• 5,490,170 — Coding apparatus for digital signal • 6,393,430 — Method and system for automatically recording music data files by using the hard drive of a personal computer as an intermediate storage medium • 6,446,080 — Method for creating, modifying, and playing a custom playlist, saved as a virtual CD, to be played by a digital audio/visual actuator device • 7,349,012 — Imaging apparatus with higher and lower resolution converters and a compression unit to compress decreased resolution image data • 6,725,155 — Method and apparatus for information processing, and medium for information processing ○ GPS routing and navigation systems
Services Provided:	**Testifying expert** for **plaintiff Mobile Media Ideas** (**MMI)** for infringement and validity. Reports (1/13/2012), depositions (4/13/2012).
Disposition:	Jury found direct infringement and upheld the validity of the asserted patents.
Date:	2011 – 2012
Contact:	Alan Federbush, 212.969.3211

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	Proskauer Rose
Case Name:	MobileMedia Ideas LLC v. Research In Motion Limited and Research In Motion Corporation, No. 3:11-cv-02353-N (3:2011cv02353), Northern District of Texas, Judge Godbey.
Patents at issue:	• 6,446,080 — Method for creating, modifying, and playing a custom playlist, saved as a virtual CD, to be played by a digital audio/visual actuator device

- 7,349,012 — Imaging apparatus with higher and lower resolution converters and a compression unit to compress decreased resolution image data
  - Digital camera resolution conversion and compression system

Services Provided: **Testifying expert** for **plaintiff MMI** for infringement and validity.
Disposition: Concluded
Date: 2011 – 2013
Contact: Alan Federbush, 212.969.3211, John Kitchura, (617) 526-9676

Expert Engagement:
Type of Matter: Patent litigation
Law Firm: Harness & Dickey
Case Name: Gibson Guitar Corp. v. 745 LLC; Case No. 3:11-cv-00058, before Hon. Sharp, Magistrate Judge Brown, Middle District of Tennessee, Nashville
Patent at issue:
- 5,990,405 — System and method for generating and controlling a simulated musical concert experience

Services Provided: **Testifying expert** for **defendant 745 LLC**, for infringement and validity. Reports, declarations, deposition, Markman claim construction hearing.
Disposition: Settled on terms favorable to my client
Date: 2011 – 2012
Contact: Kara Fussner, Rudolph Telsher, Harness & Dickey: (314) 446-7664

Expert Engagement:
Type of Matter: Patent litigation, ITC
Law Firm: Jones Day
Case Name: International Trade Commission (ITC) Investigation 337-TA-797 "On certain motion-sensitive sound effects devices and image display devices and components and products containing same", Inv. No. 337-TA-773; ALJ Gildea;
Patent at issue:
- 6,150,947 — Programmable motion-sensitive sound effects device

Services Provided: **Testifying expert**: non-infringement/invalidity for **respondent Kyocera**. Prior art research.
Disposition: Settled.
Date: 2011.
Contact: Blaney Harper, Jones Day: 202.879.3939
Jose Patiño, Jones Day, San Diego: 858.314.1200

Expert Engagement:
Type of Matter: Patent litigation
Law Firm: Flachsbart & Greenspoon
Case Name: RMail Ltd. v. Amazon.com, Inc. et al., E. Dist. Texas, 2:10-cv-00258-TJW
Patent at issue:
- 6,571,334 — Apparatus and method for authenticating the dispatch and contents of documents
- 6,182,219 — Apparatus and method for authenticating the dispatch and contents of documents

Services Provided: **Testifying expert** for **plaintiff RMail**. Software discovery, infringement analysis.
Disposition: Settled
Date: 8/5/2011
Contact: Robert Greenspoon, Flachsbart & Greenspoon 312-551-9500

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	Irell & Minella, LLP
Case Name:	International Trade Commission (ITC): Microsoft Corporation v. Tivo Inc., "Certain Set-Top Boxes and Hardware and Software Components Thereof", Investigation No. 337-TA-761 (ITC), No. 2:11-cv-00134 (W.D. Wash.) ALJ: Gildea.
Complaintant:	Microsoft Corporation
Respondent:	Tivo Inc.
Patents at issue:	• 5,585,838 — Program time guide • 5,731,844 — Television scheduling system for displaying a grid representing scheduled layout and selecting a programming parameter for display or recording • 6,028,604 — User friendly remote system interface providing previews of applications • 5,758,258 — Selective delivery of programming for interactive televideo system
Services Provided:	**Testifying expert** for **defendant Tivo**. Report.
Disposition:	Settled
Date:	3/28/2011
Contact:	Eric Carsten, Chris Vanderlaan, Irell & Minella, (310) 203-7031

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	Graves Dougherty Hearon & Moody
Case Name:	MONKEYmedia Inc. v. Apple, Inc. Case No. 1:2010cv00319, Texas Western District, Austin, Judge Sam Sparks, patents at issue: Seamless Contraction
Patents at issue:	Seamless contraction patents: • US 6,177,938 — Computer user interface with non-salience deemphasis • US 6,219,052 — Computer user interface with non-salience deemphasis • US 6,335,730 — Computer user interface with non-salience deemphasis Seamless expansion patents • US 6,393,158 — Method and storage device for expanding and contracting continuous play media • US 7,467,218 — Method and storage device for expanding and contracting continuous play media • US 7,890,648 — Audiovisual presentation with interactive seamless branching and/or telescopic advertising
Services Provided:	Consulting expert for plaintiff: infringement analysis. **Testifying expert** for **plaintiff MONKEYmedia**: claim construction. Markman claim construction hearing.
Disposition:	Ongoing
Date:	2010 –
Contact:	Steve Smit, Graves Dougherty Hearon & Moody: 512-480-5600

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	Graves Dougherty Hearon & Moody
Case Name:	MONKEYmedia Inc. v. Disney, Inc. et al. Case No. 1:10-cv-00533-SS, Texas Western District, Austin, Judge Sam Sparks

Patents at issue:	Seamless Contraction: • 6,335,730 — Computer user interface with non-salience deemphasis Seamless Expansion: • US 6,393,158 — Method and storage device for expanding and contracting continuous play media • US 7,467,218 — Method and storage device for expanding and contracting continuous play media • US 7,890,648 — Audiovisual presentation with interactive seamless branching and/or telescopic advertising
Services Provided:	Consulting expert for plaintiff: infringement analysis. **Testifying expert** for **plaintiff MONKEYmedia**: claim construction on Seamless Contraction Patents.
Disposition:	Ongoing
Date:	2010 –
Contact:	Steve Smit, Graves Dougherty Hearon & Moody: 512-480-5600

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	Stroock & Stroock & Lavan
Case Name:	Mirror Worlds, LLC v. Apple Computer, Inc. Case No. 6:2008cv00088, Texas Eastern District Court, Tyler, Judge Leonard Davis
Patents at issue:	• 6,006,227 — Document stream operating system • 6,638,313 B1 — Document stream operating system • 6,725,427 B2 — Document stream operating system with document organizing and display facilities • 6,768,999 B2 — Enterprise, stream-based, information management system
Services Provided:	**Consulting expert** for plaintiff (expert of record: Dr. John Levy): infringement analysis. Source code analysis. Technology analysis of Apple Computer OSX operating system and applications software source code for products including Spotlight, CoverFlow, Finder, and Time Machine in Tiger and Leopard releases, IOS operating system and applications software source code for iPod, iPhone, Apple TV, and xServe. This was a very large-scale discovery project, requiring analysis of approximately 1.5 billion lines (not bytes, lines) of disclosed source code.
Disposition:	On 10/1/2010 a jury in EDT found Apple willfully infringed, and set a $625 million dollar judgment. Judge Davis subsequently reversed the judgment while upholding the validity of the patents.
Date:	2009 – 2010.
Contact:	Kenneth Stein, Stroock & Stroock: 212-806-5491

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	Robins, Kaplan, Miller & Ciresi LLP
Case Name:	St. Clair Intellectual Property Consultants v. Samsung Electronics Co., Ltd., et al., Case No. 1:04-cv-1436-JJF-LPS, United States District Court for the District of Delaware, Judge: Joseph J. Farnan
Patents at issue:	• 5,138,459 — Electronic still video camera with direct personal computer (PC) compatible digital format output • 6,094,219 — Electronic still video camera with direct personal computer (PC) compatible digital format output

- 6,323,899 B1 — Process for use in electronic camera

Services Provided: **Consulting expert** for plaintiff (expert of record: Tom Gafford): infringement analysis of digital camera technology. Reviewed thousands of digital camera technical drawings, schematics, block diagrams, parts lists, service manuals, engineering product specifications, technical manuals, industry standards, and user guides for specific analog and digital technologies such as CCDs, SDRAM, video DSPs, microprocessors, embedded software APIs, and other camera technologies at issue, wrote reports.

Disposition: All work for client completed in 2009. (Note: Samsung settled before my work on this case began.)

Date: 2009.

Contact: Robins Kaplan: Seth Northrop: 612.349.8500; Brock Spect: 612.349.8500

Expert Engagement:

Type of Matter: Inequitable conduct

Law Firm: Flachsbart & Greenspoon, LLC

Case Name: 1st Media. v. Electronic Arts, Inc., Harmonix Music Systems, Inc., Microsoft Corporation, Viacom, Inc. and Sony Computer Entertainment America, Inc., Case No. 2:07-cv-1589-JCM-RJJ, United States District Court, District of Nevada, Judge: Kent J. Dawson

Patent at issue: US 5,464,946 — Karaoke information entertainment system

Services Provided: **Testifying expert**: Inequitable Conduct. Evaluate materiality of pertinent prior art for plaintiff's patent, rendering expert opinion, deposition, declarations, briefs.

Disposition: The Court of Appeals reversed the District Court, finding for 1st Media.

Date: 2009 – 2012

Contact: William W. Flachsbart, Robert Greenspoon, 312-551-9500

Expert Engagement:

Type of Matter: Patent litigation

Law Firm: Flachsbart & Greenspoon, LLC

Case Name: ValueClick, Inc. v. Tacoda, Inc., Case No. 2:2008cv04619, California Central District Court, Western Division - Los Angeles Office, Judge Dale S. Fischer

Patents in suit:

- 5,848,396 — Method and apparatus for determining behavioral profile of a computer user
- 5,991,735 — Computer program apparatus for determining behavioral profile of a computer user

Services Provided: **Testifying expert**: Patent infringement. Patent and technology infringement analysis of Tacoda's internet behavioral advertising product, rendering expert opinion, declarations, briefs.

Disposition: Dismissed.

Date: 2008 – 2010.

Contact: William W. Flachsbart, Robert Greenspoon, 312-551-9500

Expert Engagement:

Type of Matter: Patent litigation

Law Firm: Quinn Emanuel Erquhart Oliver & Hedges, LLP

Case Name: Activision Publishing, Inc. v. Gibson Guitar Corporation.
Case No. CV08-01653 MRP (SHx)
Central District Court of California, Hon. Mariana R. Pfaelzer

Patent at issue:	• US 5,990,405 — System and method for generating and controlling a simulated musical concert experience
Services Provided:	**Testifying expert for infringement, for plaintiff**: Patent infringement. Patent and technology infringement analysis of Activision's Guitar Hero product, rendering expert opinion, declarations, briefs.
Disposition:	Activision sued Gibson for declaratory judgment of patent non-infringement and invalidity and related issues. Activision's motion for Summary Judgment was granted. The parties subsequently settled.
Date:	2008 – 2009.
Contact:	James M. Glass (212) 849-7000, Edward J. DeFranco (212) 849-7000

Expert Engagement:

Type of Matter:	Copyright litigation
Law Firm:	Cooley Godward Kronish LLP
Case Name:	Atlantic Recording Corp. et al v. XM Satellite Radio Inc., 06 CV 3733 (LAK), Famous Music LLC et al v. XM Satellite Radio Inc., 07 CV 2385 (LAK) and Nota Music Publishing, Inc. v. XM Satellite Radio Inc., 07 CV 4682 (LAK), Southern District Court of New York, Judges Batts and Kaplan
Services Provided:	**Testifying expert**: Copyright infringement. Analysis of XM Satellite *INNO* product to help determine whether it meets the statutory definition of a Digital Audio Recording Device (DARD) under the terms of the Audio Home Recording Act of 1992.
Disposition:	Settled.
Date:	2008 – 2011.
Contact:	Steven A. Wieder (212) 479-6263

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	Flachsbart & Greenspoon, LLC
Case Name:	1st Technology LLC, v. Tiltware LLC, Civil Action No. 2:06-cv-323-LDG-RJJ, U.S. District Court, Nevada
Patent in suit:	• 5,564,001 A — Communications system ○ A communications system for transmitting interactive multimedia information over a communication medium having limited bandwidth
Services Provided:	**Testifying expert**: Internet gambling. Forensic analysis of software application, "Full Tilt Poker" to determine infringement. Wrote expert report showing infringement of every element of asserted claims. Analysis was performed on executable application and DLLs downloaded from Tiltware's Internet site. Analysis was performed without benefit of source code: use of Internet packet sniffing and reverse engineering of downloaded databases established infringement sufficient to obtain favorable settlement.
Disposition:	Settled.
Date:	2008 – 2009.
Contact	Robert Greenspoon, 312-551-9500

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	McKool Smith
Case Name:	Visto Corporation v. Good Technology, Inc., Case No. 2:06-cv-00039-TJW, U.S. District Court, Eastern District of Texas, Marshall Division, Judge T. John

	Ward
Patents at issue:	• 6023708 — System and method for using a global translator to synchronize workspace elements across a network • 6085192 — System and method for securely synchronizing multiple copies of a workspace element in a network • 6151606 — System and method for using a workspace data manager to access, manipulate and synchronize network data • 6708221 — System and method for globally and securely accessing unified information in a computer network • 7039679 — System and method for globally and securely accessing unified information in a computer network
Services Provided:	**Consulting expert** for plaintiff (expert of record: Tom Gafford): analysis of email server applications regarding synchronization of personal information management (PIM) data to portable, wireless handheld devices (Good Mobile Messaging). Conducted extensive discovery of multiple large enterprise database systems (Microsoft Exchange, Lotus Notes, others), Good's proprietary network operations systems, and Good handheld devices for Personal Information Management (PIM) manufactured and distributed by Good over the course of 6 years. Conducted detailed review of over 12 gigabytes of C++ and Java source code to establish how PIM data were synchronized between enterprise databases and handheld devices. Longitudinal detailed review of multiple versions of Good's system.
Disposition:	Settled.
Date:	2007-2008.
Contact	Eric Robinson, Bo Davis, McKool Smith, 214.978.4063

Expert Engagement:

Type of Matter:	Patent litigation
Law Firm:	McKool Smith
Case Name:	Visto Corporation v. Research In Motion, Ltd. (RIM), Case No. 2-06-CV-181-TJW, U.S. District Court, Eastern District of Texas, Marshall Division, Judge T. John Ward
Patents at issue:	• 6023708 — System and method for using a global translator to synchronize workspace elements across a network • 6085192 — System and method for securely synchronizing multiple copies of a workspace element in a network • 6151606 — System and method for using a workspace data manager to access, manipulate and synchronize network data • 6708221 — System and method for globally and securely accessing unified information in a computer network • 7039679 — System and method for globally and securely accessing unified information in a computer network
Services Provided:	**Consulting expert** for plaintiff (expert of record: Tom Gafford): analysis of email server applications regarding synchronization of personal information management (PIM) data to portable, wireless handheld devices (Research In Motion/BlackBerry). Conducted extensive discovery of multiple large enterprise database systems (Microsoft Exchange, Lotus Notes, others), RIM proprietary network operations systems, and RIM handheld devices for Personal Information Management (PIM) manufactured and distributed by RIM over the course of five years. Conducted detailed review of over 130 gigabytes of C++ and Java source

code to establish how PIM data were synchronized between enterprise databases and handheld devices. Longitudinal detailed review of multiple versions of RIM's system.

Disposition: Settled.
Date: 2007-2008.
Contact Eric Robinson, Bo Davis, McKool Smith, 214.978.4063

Expert Engagement:
Type of Matter: Patent litigation
Law Firm: Vanek, Vickers & Massini
Case Name: Premiere International Associates LLC v. Apple Computer, Inc. No. 05-CV-506, U.S. District Court Eastern District of Texas Marshall Division, Judge T. John Ward.
Patents at issue:
- 6,763,345 — List building system
  - A system for creating a list of selected works
- 6,243,725 — List building system
  - A system for creating and editing play lists

Services Provided: **Consulting expert** /software analyst for plaintiff (expert of record: Tom Gafford): white-box analysis of Apple iTunes software source code written in C/C++, and iTunes Store (iTMS) enterprise software source code written in java and SAP/ABAP. White-box source code analysis was performed on seven versions of iTunes from the original release through version 7.1 for infringement of more than 100 claims. Each version of iTunes constituted in excess of 800,000 lines of C/C++. Analysis was performed on Windows (using Visual Studio .NET IDE) and Macintosh (using XCode and CodeWarrior IDEs). Static analysis of enterprise software source code for Apple's iTunes Store, which handles transactions with iTunes users on the front end and manages a large enterprise database. Over 1.4 million lines of java. Identify relevant files and functions for the various claims, debug the code, plant breakpoints, caption and print stack traces, identify what the program was doing and identify specific lines of code for potential infringement. Conducted extensive source code review of Apple iTunes application to determine potential infringement of playlist technology. Determined the exact manner of iTunes operation for playlist management in the form of stack traces, documented significance of breakpoints to infringement arguments
Disposition: Settled.
Date: 2006-2007.
Contact: Joe Vanek, Vanek, Vickers & Massini, 312.224.1502

Expert Engagement:
Type of Matter: Patent litigation
Law Firm: Quarles & Brady
Case Name: Case settled before being filed.
Patents at issue:
- 5,693,902 — Audio block sequence compiler for generating prescribed duration audio sequences
- 5,877,445 — System for generating prescribed duration audio and/or video sequences

Services Provided: **Testifying expert** – music composition, software architecture, digital audio. Software analysis of Sony Corporation of America product Cinescore 1.0. Reviewed Cinescore 1.0 for potential infringement of patents relating to

automatic composition of music. The patents covered a method of music composition by audio segment concatenation. Drafted potential infringement report.

Disposition: Settled.
Date: 2007.
Contact: David R. Cross, Quarles & Brady 414.277.5669

Expert Engagement:
Type of Matter: Patent litigation support
Firm: S-Systems, Inc.
Case Name: Digeo, Inc. v. Audible, Inc., Case No. C05-00464-JLR, Seattle.
Patent at issue:
- 5,734,823 — Systems and apparatus for electronic communication and storage of information

Services Provided: **Consulting expert**: software architecture, digital audio. Analysis of a large (over 13,000 files) C++ project that implemented a Windows .NET application to perform management of audio content, encryption, audio downloading from the Internet, and device integration for handheld players. The assignment was to determine whether the application could be shown to infringe patent claims. I was tasked to identify the relevant files, compile them, correct program errors and create workarounds so that the executing application could be evaluated, evaluate the execution of the code, plant breakpoints, walk the stack, identify what the program was doing and identify specific lines of code for potential infringement.
Disposition: Settled.
Date: 2006.
Contact: Please contact Gareth Loy for information about this reference.

Expert Engagement:
Type of Matter: Patent litigation
Law Firm: Wilmer Hale
Case Name: Information Technology Innovation, LLC v. Motorola, Inc. et al.
Patent at issue:
- 4,796,194 — Real world modeling and control process
  - A process for modeling a manufacturing plant

Services Provided: **Testifying expert for infringement**: software architecture. Wrote infringement report evaluating a 1300-line Fortran 77 software program dating from 1986. Project required me to compile and run the software, which involved identifying numerous bugs in the code and providing workarounds so that the code could be evaluated at runtime.
Disposition: Settled.
Date: 2006.
Contact: John Hintz: John.Hintz@WilmerHale.com

Expert Engagement:
Type of Matter: Patent litigation
Law Firm: McDermott, Will & Emery
Case Name: Audio MPEG, Inc. v. Creative Labs, Inc., Creative Holdings, Inc., and Creative Technology Ltd., Case No. 2:05CV185--JBF-FBS
Patents at issue:
- Rault et. al., 5,214,678 — Digital transmission system using subband coding of a digital signal
- Lokhoff 5,777,992 — Decoder for decoding and encoded digital signal

and a receiver comprising the decoder
- Lokhoff 5,323,396 — Digital transmission system, transmitter and receiver for use in the transmission system
- Lokhoff 5,539,829 — Subband coded digital transmission system using some composite signals
- Grill et al. 5,579,430 — Digital encoding process
    - A digital coding process for at least one of transmitting and storing acoustical signals

Services Provided: **Testifying expert**: Mathematics of MPEG/MP3 audio, subband coding, frame size, intensity stereo. Detailed claims analysis. Wrote numerous reports regarding the mathematics of MPEG/MP3 encoding/decoding process. Researched the history of the development of this highly mathematical discipline from its origins in the short time Fourier transform through its modern implementations by Fraunhofer and others.
Disposition: Settled.
Date: 2005 – 2006.
Contact: Robert Blanche, Chris Bright, Lucy Koh: 650.813.5133

Expert Engagement:
Type of Matter: Patent litigation
Law Firm: Weil, Gotshal, Manges
Case Name: Seer Systems, Inc. v. Beatnick, Inc. & Microsoft Inc., Case No. C 03 4636 JSW (EDL), Northern District of California, San Francisco Division, Judge: Hon. Jeffrey S. White.
Patent at issue:
- 5,886,274 — System and method for generating, distributing, storing and performing musical work files

Services Provided: **Testifying expert**: music composition systems, MIDI, networking. **Deposition** taken. Developed and presented **Markman tutorial** presented before Judge White.
Disposition: Settled.
Date: 2004.
Contact: Jared Bobrow: 650.802.3034, Perry Clark: 415-439-1938

Expert Engagement:
Type of Matter: Patent litigation
Law Firm: Orrick, Herrington, Sutcliffe
Case Name: Aureal Semiconductor, Inc. v. Creative Technology Ltd., et al., Northern Dist. of Cal, Civil Action No. C98-4550 MHP
Patent at issue:
Services Provided: **Testifying expert**: regarding a means of rendering 3D digital audio.
Disposition: Dismissed.
Date: 1999 – 2000.
Contact: Lisa-Marie Schull (State Bar 196132)

Expert Engagement:
Type of Matter: Trademark infringement
Law Firm: Buchalter Nemer Fields & Younger
Case Name: Industrial Indemnity Co. v. Apple Computer, Inc.
Services Provided: **Testifying expert**: digital audio and music technology
Deposition taken; **testified at trial**. Presented several demonstrations of Apple

	Computer music and audio technology to the jury. Three days of jury testimony under oath.
Disposition:	Won on appeal.
Date:	1994 – 1995.
Contact:	Stephen Sommerhalter: ssommerhalter@buchalter.com (retired)

Consulting Engagement:

Client:	Buchla & Assoc.
Services Provided:	Developed software architecture and implemented all software for the Buchla 259e Programmable Complex Waveform Generator. Features include: dual digital oscillators (modulating and carrier) with various waveforms, FM, AM, waveshaping, soft and hard sync, MIDI control, presets, control panel, knobs, switches and control voltages. (See http://www.buchla.com and search for 200e and 259e). C/C++

Consulting Engagement:

Client:	Chromatic Research (bought by ATI Technologies)
Services Provided:	Algorithm development for audio synthesis and processing on MPACT1 DSP.

Consulting Engagement:

Client:	Frox, Inc.
Services Provided:	Architected, developed, debugged, implemented, and shipped an ambitious multi-DSP digital home entertainment system

Consulting Engagement:

Client:	Philips Semiconductor
Services Provided:	Developed and licensed a custom C++ MSDEV application software to Philips that documented a large instruction set for a 64-bit media processor from the machine description sources. Developed a separate program to verify the correctness of the pseudocode implementation of all instructions

Consulting Engagement:

Client:	Equator Technologies
Services Provided:	Extended their C/C++ compiler to automatically document Equator's Application Programming Interface (API) source code for their DSP, written in C

Consulting Engagement:

Client:	Raza Microelectronics
Services Provided:	Wrote the XLR Programmer's Reference Manual for the XLR family of Threaded Processors

Consulting Engagement:

Client:	Pixim, Inc.
Services Provided:	Created Developer's Guide documenting features, architecture, theory of operation, hardware, software and firmware for advanced wide dynamic range video camera sensor technology

Consulting Engagement:
Client: Philips Semiconductor
Services Provided: Wrote Ethernet MAC chapter for new TriMedia processor architecture document

Consulting Engagement:
Client: Cradle Technologies
Services Provided: Developed design kit guide for their Hammerhead videoconferencing system including development system setup, chip architecture, software APIs, software development tools, and debugging

Consulting Engagement:
Client: Siemens Microelectronics
Services Provided: Data book for the TriCore TC10 embedded processor. User guides for TriCore simulators

Consulting Engagement:
Client: Infineon Technologies
Services Provided: Data book for Infineon MPSystem, a single-core 32-bit microcontroller DSP architecture for real-time embedded systems

Consulting Engagement:
Client: Zoran Corporation
Services Provided: User guide for Vaddis ZR36730 Integrated DVD Decoder chip

Consulting Engagement:
Client: Dolby Laboratories
Services Provided: Market evaluation for consumer application of AC3 encoding

Consulting Engagement:
Client: Sony, Inc.
Services Provided: User Guide for the Sonoma Digital Audio Workstation

Consulting Engagement:
Client: Malleable Technologies
Services Provided: Architecture documents and data sheets for VoIP DSP core

Consulting Engagement:
Client: C-Cube Microsystems
Services Provided: Ziva-Kit DVD decoder architecture documents, and white papers on DVD decoding algorithms

Consulting Engagement:
Client: TriMedia Technologies, Inc.
Services Provided: Several chapters of the TM1100 and TM1300 Data Books, including the audio and video I/O subsystems, memory management system, and instruction compression

Consulting Engagement:
Client: BOPS, Inc. ("Billions of Operations Per Second, Inc.")
Services Provided: C/C++ optimizing compiler for their scalable multi-DSP processor system

Consulting Engagement:
Client: SeaSound, LLP
Services Provided: User Guide for the SeaSound Solo digital audio processing system

Consulting Engagement:
Client: Palm, Inc.
Services Provided: C++ Generic Conduit Guide

- Member, Association of Computing Machinery (ACM)
- Member, Institute of Electrical and Electronics Engineers (IEEE)
- Member, International Computer Music Association (ICMA)
- Member, Audio Engineering Society (AES)
- Management Incentive Award, UCSD (1988)
- Fellow, Deutscher Akademischer Austauschdienst (DAAD), Berliner Kunstlerprogramm, Berlin (1986)
- Bourges Prize, Digital Electroacoustic Music category (1981)
- National Endowment for the Arts grant recipient (1981)

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programming languages for music," *Current Directions in Computer Music*, Max Mathews, John Pierce, eds., Cambridge: MIT Press, 1990.

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2011 "Music, Expectation, and Information Theory", lecture delivered to the American Association for the Advancement of Science (AAAS) conference, San Diego, CA, June 14, 2011.

2011 "Software Discovery — Best Practices", lecture delivered with Tom Gafford to the IEEE CNSV, Sunnyvale, CA, May, 2011.

2009 "Introduction to the Mathematics of Music" Private lecture, Fairfax, CA, February 2009.

2007 "A Brief History of Musical Scales." Lecture presented to the Ear Club, Psychology Dept., Univeristy of California, Berkeley, February, 2007.

2007 "Musical Scale Builders — the First Psychoacousticians." Lecture presented to the Hearing Seminar, Center for Computer Research in Music and Acoustics (CCRMA), Stanford University, Stanford, CA, May, 2007.

2007 "Music, Expectation, and Information Theory." Lecture presented to the Music and Human Behavior conference, Stanford Graduate Summer Institute 2007 (SGSI07) held at CCRMA, Stanford University, Stanford, CA, facilitated by Vinod Menon and Jonathan Berger, September 2007.

2007 "Information Theory and Expectation in Music." Lecture presented to the NSF Integrative Graduate Education and Research Traineeship Program (IGERT) seminar series at UCSB, November 30th, 2007, facilitated by Stephen Travis Pope and Curtis Roads.

2006 "The Grand Story of Musical Scales." Tutorial presented to the Audio Engineering Society 121st Convention, San Francisco, August, 2006.

EXHIBIT B

MATERIALS CONSIDERED

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2. Deposition transcript of V. Michael Bove, dated 5/29/2014 (2012)

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