

**In re: UNITED STATES PATENT  
AND TRADEMARK OFFICE**

***YAMAHA CORPORATION OF AMERICA***

*v.*

***BLACK HILLS MEDIA, LLC***

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***V. MICHAEL BOVE, JR.***

***May 30, 2014***

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**MERRILL LAD**

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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YAMAHA CORPORATION OF AMERICA  
Petitioner

vs.

BLACK HILLS MEDIA, LLC  
Patent Owner

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Case No. IPR2013-00593  
US Patent 8,045,952

Case No. IPR2013-00594  
US Patent 8,050,652

VIDEO DEPOSITION OF

V. MICHAEL BOVE, JR.

BOSTON, MASSACHUSETTS

FRIDAY, MAY 30, 2014

REPORTED BY:

DENISE D. HARPER-FORDE

Certified Shorthand Reporter (CSR)

Certified Real-Time Reporter (CRR)

Registered Professional Reporter (RPR)

Notary Public (CT, MA, RI)

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May 30, 2014

Video Deposition of V. MICHAEL BOVE, JR.,  
taken on behalf of the Patent Holder, at  
the law offices of PEPPER HAMILTON, LLP,  
125 High Street, Boston, Massachusetts, at  
10:00 A.M., Friday, May 30, 2014. Before  
Denise D. Harper-Forde, Certified Shorthand  
Reporter, Registered Professional Reporter,  
Certified Real-Time Reporter, and Notary  
Public of the State of Massachusetts.

1 A P P E A R A N C E S

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1 I N D E X

2

3 WITNESS: V. MICHAEL BOVE, JR.

4

5 EXAMINATION PAGE

6 By Mr. Engellenner 9, 175

7 By Mr. Fehrman 151

8

9 EXHIBITS

10 NUMBER DESCRIPTION PAGE

11

12 Exhibit 1 -- Deposition Notice 10

13 Exhibit 2 -- '593 Declaration of  
14 Dr. Bove 11

15 Exhibit 3 -- '593 Patent 11

16 Exhibit 4 -- Initial '593 Decision 12

17 Exhibit 5 -- '952 Patent 12

18 Exhibit 6 -- Deposition Notice 12

19 Exhibit 7 -- '594 Declaration 13

20 Exhibit 8 -- '594 Decision 13

21 Exhibit 9 -- '594 Patent 13

22 Exhibit 10 -- '652 Patent 14

23 Exhibit 11 -- '986 Patent 14

24 Exhibit 12 -- '194 Patent 15

25 Exhibit 13 -- '353 Patent 15

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I N D E X (CONT'D)

WITNESS: V. MICHAEL BOVE, JR.

EXHIBITS

NUMBER	DESCRIPTION	PAGE
Exhibit 14 --	Qureshey PCT Application	15
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Exhibit 16 --	'127 Patent	16

\* \* \* \* \*

VIDEOGRAPHER: Gayle Ashton  
ALSO PRESENT: Alicia Palladino  
(Summer Associate)

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Boston, Massachusetts

Friday, May 30, 2014

10:07 AM

\* \* \* \* \*

VIDEOGRAPHER: This is the video operator speaking, Gayle Ashton with Merrill Legal Solutions. Today's date is May 30th, 2014, and the time is 10:07 AM.

We are here at the offices of Pepper Hamilton, located at 125 High Street, Boston, Massachusetts, to take the videotaped deposition of V. Michael Bove, Jr.

This is a proceeding in the United States Patent and Trademark Office before The Patent Trial and Appeal Board. Yamaha Corporation of America, Petitioner versus Black Hills Media, LLC, patent owner. Case number IPR2013-00593, US Patent 8,045,952. And Case No. IPR2013-00594, US Patent 8,050,652.

Will counsel please state their appearances.

MR. ENGELLENNER: Tom Engellenner,

1 Pepper Hamilton, attorney for the Black  
2 Hills Media, patent owner.

3 MS. GLADSTEIN: Lana Gladstein of  
4 Pepper Hamilton, representing Black Hills  
5 Media.

6 MR. SCHULTZ: Andrew Schultz of  
7 Pepper Hamilton, Black Hills Media.

8 MR. YAP: If you can introduce --

9 MR. ENGELLENNER: If you don't  
10 mind, I'd like to introduce our expert,  
11 Ivan Zackovich. And we have a second-year  
12 law student that's just sitting in for  
13 observation, if you don't mind.

14 MR. YAP: No problem.

15 MR. ENGELLENNER: Thanks.

16 MR. YAP: Alex Yap of Morrison &  
17 Foerster for Petitioner, Yamaha Corporation  
18 of America.

19 MR. FEHRMAN: David Fehrman,  
20 Morrison & Foerster for the Yamaha  
21 Corporation of America.

22 MR. YAP: So, Counsel, I think  
23 before the deposition started we reached a  
24 stipulation that for these four  
25 proceedings, depositions in these four



1 proceedings, the witnesses would have the  
2 right to review and revise the transcript  
3 under the rules.

4 MR. ENGELLENNER: And I believe we  
5 also stipulated that this deposition will  
6 be used in both the -- two enter parties  
7 review proceedings. 2014-593 and 2014 --  
8 '13, excuse me. 2013-593 and '594.

9 MR. YAP: Yes.

10 MR. ENGELLENNER: And hopefully we  
11 can just refer to these two proceedings as  
12 '593 and '594 throughout the day.

13 I think we also stipulated that as  
14 to common issues, testimony that was given  
15 today and yesterday can be used  
16 interchangeably in the two cases.

17 Is that your understanding?

18 MR. FEHRMAN: I'm not sure we know  
19 what a common issue is necessarily. There  
20 is some overlapping references.

21 MR. ENGELLENNER: Overlapping  
22 references and credentials. So that we  
23 don't need to go through a full --

24 MR. FEHRMAN: Certainly with  
25 credentials.

1 MR. ENGELLENER: -- investigation  
2 of Dr. Bove's credentials.

3 MR. YAP: Yeah. My understanding  
4 was the credentials from yesterday but I  
5 wasn't quite aware that there was an  
6 understanding regarding common issues.

7 I guess it depends on what that  
8 common issue is.

9 MR. ENGELLENER: Okay.

10 MR. YAP: And we can fight over  
11 that later.

12 MR. ENGELLENER: Okay.

13 VIDEOGRAPHER: Will the Court  
14 Reporter please swear in the witness.

15 \* \* \* \* \*

16 V. MICHAEL BOVE, JR., hereinbefore  
17 named, being first duly cautioned and sworn  
18 or affirmed to tell the truth, the whole  
19 truth, and nothing but the truth, was  
20 examined and testified as follows:

21 \* \* \* \* \*

22 DIRECT EXAMINATION

23 (BY MR. ENGELLENER):

24 Q. Dr. Bove, I'd like to thank you for  
25 agreeing to sit through depositions two

1 days in a row, and I know yesterday was a  
2 rather grueling day. And hopefully today  
3 will be shorter.

4 A. Thank you.

5 Q. And we'll follow the same procedure  
6 as yesterday. We'll break every hour. If  
7 you need a break, though, at any time, just  
8 please let me know. If you could just  
9 answer the question before you and allow me  
10 just any follow-up for that particular line  
11 of questioning, I would appreciate it and  
12 then we'll break.

13 Is that okay with you?

14 A. Yes. Thank you very much.

15 Q. Great. And is there any reason why  
16 you cannot testify fully and accurately  
17 today?

18 A. No.

19 Q. Thank you. I'm going to show you a  
20 series of documents, and we're going to  
21 have them marked as exhibits, and then we  
22 can begin the deposition.

23 (Whereupon, Exhibit No. 1,  
24 Deposition Notice, was marked for  
25 identification)

1 MR. ENGELLENER: The first Exhibit  
2 is the deposition notice from the '593  
3 proceeding.

4 (Whereupon, Exhibit No. 2, '593  
5 Declaration of Dr. Bove, was  
6 marked for identification)

7 MR. ENGELLENER: The second  
8 Exhibit is, I believe it's your declaration  
9 from the '593 proceeding. I'd like you to  
10 look at it and just verify that.

11 MR. YAP: Counsel, what exhibit  
12 number is this?

13 MR. ENGELLENER: That's Exhibit 2.

14 MR. YAP: Okay.

15 (BY MR. ENGELLENER):

16 Q. And on the last page before the  
17 appendix, that is your signature;  
18 correct?

19 A. Yes.

20 Q. Thank you.

21 (Whereupon, Exhibit No. 3, '593  
22 Petition, was marked for  
23 identification)

24 MR. ENGELLENER: The third exhibit  
25 is the petition that was filed by Yamaha in

1 the '593 proceeding.

2 (Whereupon, Exhibit No. 4, Initial  
3 '593 Decision, was marked for  
4 identification)

5 MR. ENGELLENER: The fourth  
6 exhibit I'd like to show you is the initial  
7 decision of the Patent Trial and Appeal  
8 Board to institute a proceeding that we're  
9 referring to throughout here as the '593  
10 proceeding.

11 (Whereupon, Exhibit No. 5, '952  
12 Patent, was marked for  
13 identification)

14 MR. ENGELLENER: Finally, to round  
15 out this '593 proceeding, I'd like to show  
16 you a copy of the US Patent 8,045,952;  
17 which is the Patent at issue in this  
18 proceeding; is that correct?

19 THE WITNESS: That's my  
20 understanding. Thank you.

21 (Whereupon, Exhibit No. 6,  
22 Deposition Notice, was marked for  
23 identification)

24 MR. ENGELLENER: Okay. Just to  
25 get everything out of the way, I'd also

1       like to show you the Deposition Notice from  
2       the second proceeding that we're going to  
3       be discussing about today, and that would  
4       be Exhibit Number 6.

5                   (Whereupon, Exhibit No. 7, '594  
6                   Declaration, was marked for  
7                   identification)

8                   MR. ENGELLENER: And I'd like to  
9       show you Exhibit Number 7, which is, I  
10      believe, your declaration from the '594  
11      proceeding.

12                   And if you could just verify that  
13      that is indeed your signature on the last  
14      page before the appendix of that  
15      declaration as well, I'd appreciate it.

16                   THE WITNESS: Yes.  
17                   (Whereupon, Exhibit No. 8, '594  
18                   Petition, was marked for  
19                   identification)

20                   MR. ENGELLENER: Thank you. I'm  
21      going to show you Exhibit 8, which is the  
22      petition that was filed by Yamaha in  
23      connection with the '594 proceeding.

24                   (Whereupon, Exhibit No. 9, '594  
25                   Decision, was marked for

1 identification)

2 MR. ENGELLENER: And next Exhibit  
3 9, which is the decision of the Patent  
4 Trial and Appeal Board to institute a  
5 review proceeding that we'll be referring  
6 to throughout as the '594 proceeding.

7 (Whereupon, Exhibit No. 10, '652  
8 Patent, was marked for  
9 identification)

10 MR. ENGELLENER: And Exhibit 10 is  
11 US Patent 8,050,652, which is the Qureshey  
12 Patent, which is the subject matter of the  
13 '954 -- excuse me, the '594 proceeding.

14 (Whereupon, Exhibit No. 11, '986  
15 Patent, was marked for  
16 identification)

17 MR. ENGELLENER: Exhibit 11 is US  
18 Patent 8,010,986, which I believe is a  
19 patent that names you as an inventor.

20 And when you get a chance, if you  
21 could just review that and confirm that  
22 that is indeed a patent that you are an  
23 inventor of?

24 THE WITNESS: Yes, it is.

25 MR. ENGELLENER: Thank you.

1                   (Whereupon, Exhibit No. 12, '194  
2                   Patent, was marked for  
3                   identification)

4                   MR. ENGELLENER: Exhibit 12 is US  
5 Patent 6,502,194, issued to Berman, et al.  
6 And hopefully we'll be able to refer to  
7 this throughout the proceedings as the  
8 Berman Patent.

9                   (Whereupon, Exhibit No. 13, '353  
10                  Patent, was marked for  
11                  identification)

12                  MR. ENGELLENER: Exhibit 13 is US  
13 Patent 7,472,353 issued to Wolff, et al.  
14 And we'll refer to this, if you don't mind,  
15 as the Wolff Patent.

16                  (Whereupon, Exhibit No. 14,  
17                  Qureshey PCT Application, was  
18                  marked for identification)

19                  MR. ENGELLENER: Exhibit 14 is an  
20 International Patent Application,  
21 publication number WO-99/38266, filed by  
22 Qureshey.

23                  And if you don't mind, we'll refer  
24 to that throughout as the Qureshey Patent,  
25 or would you prefer the --



1 THE WITNESS: That may cause a  
2 little bit of confusion, because it's not  
3 the only Qureshey document we're going to  
4 be discussing today.

5 MR. ENGELLENNER: I understand. So  
6 maybe we can refer to it as the Qureshey --

7 THE WITNESS: Application?

8 MR. ENGELLENNER: PCT application.  
9 Okay?

10 THE WITNESS: Or Qureshey PCT  
11 Application.

12 (Whereupon, Exhibit No. 15, '947  
13 Patent, was marked for  
14 identification)

15 MR. ENGELLENNER: Exhibit 15 is US  
16 Patent 7,187,947 issued to White, et al.  
17 And again, if you don't mind, we'll just  
18 refer to this as the White Patent.

19 (Whereupon, Exhibit No. 16, '127  
20 Patent, was marked for  
21 identification)

22 MR. ENGELLENNER: Exhibit 16 is US  
23 Patent 6,587,127, issued to Leeke,  
24 L-E-E-K-E, et al. And if you don't mind,  
25 we'll refer to this as the Leeke Patent.

1                   THE WITNESS: Might I just, since  
2                   we're talking about what we're going to be  
3                   calling various documents, in order to  
4                   avoid confusion, I may be referring to the  
5                   documents associated -- let's say the  
6                   declaration, the petition, and the decision  
7                   associated with the '652 Patent as the '652  
8                   declaration, the '652 petition, and the  
9                   '652 decision; rather than referring to the  
10                  '594; and similarly for '952.

11                  MR. ENGELLENER: That's fine.

12                  (BY MR. ENGELLENER):

13                  Q. Now, you were -- forgive me for  
14                  asking some leading questions. I'm going  
15                  to try and summarize the discussions and  
16                  questioning from yesterday.

17                  You were retained by Yamaha or its  
18                  counsel as an expert in both the '593 and  
19                  the '594 proceedings?

20                  A. Yes.

21                  Q. And that would be the proceedings  
22                  on the Patents '652 and '952?

23                  A. Yes.

24                  Q. Okay. And I believe you testified  
25                  yesterday that you served as an expert in

1 patent proceedings before; is that  
2 correct?

3 A. Yes.

4 Q. And your C.V. lists over a dozen  
5 expert witness engagements in patent  
6 litigation going back to 1997; correct?

7 A. Going back to the 1990s, yes.

8 Q. Okay. And I believe you also  
9 testified that you've been deposed perhaps  
10 20 times in the past in connection with  
11 your role in patent litigation?

12 A. Somewhere around that many times.

13 Q. Okay. And normally were you on one  
14 side or the other of patent disputes? Are  
15 you typically asked to serve as an expert  
16 by a Defendant in patent litigation, and  
17 seeking to have an opinion in validating  
18 the patent, or is it both ways?

19 A. It's probably about 50/50 over the  
20 years.

21 Q. Any examples of defending a patent  
22 that come to mind?

23 A. Let me see if there are any  
24 examples in the C.V. attached to my  
25 declaration.

1                   A recent example would have been  
2                   expert witness work I did on behalf of  
3                   Funai at the International Trade  
4                   Commission.

5                   Q.   And so you were retained to assist  
6                   the patent owner?

7                   A.   Yes.

8                   Q.   Okay.  Thank you.  And I believe  
9                   you testified yesterday that you devoted  
10                  29.25 hours from August 6th through  
11                  September 30th in preparing your expert  
12                  reports on both of the proceedings we're  
13                  talking about today, as well as the two  
14                  proceedings that we talked about  
15                  yesterday?

16                  A.   Yes.

17                  Q.   And so that's roughly seven and a  
18                  half hours per case; correct?

19                  A.   Well, some of the work that I did  
20                  might have applied to more than one case at  
21                  any given time.  And the declarations are  
22                  varying lengths.

23                  So I may have spent more time  
24                  writing one declaration than another.  If  
25                  one wanted to compute an average, I suppose

1 one could.

2 Q. And in each of the proceedings, you  
3 reviewed the patent, certain prior art, you  
4 formulated opinions, and you wrote a  
5 report; correct?

6 A. A declaration, yes.

7 Q. Declaration. And you wrote these  
8 expert declarations yourself; correct?

9 A. Except for the front matter.

10 Q. The front matter?

11 A. So in each of these declarations  
12 it's obviously a cover page that I didn't  
13 generate. I also have been -- I was  
14 provided information. I was provided  
15 language to put into things like the  
16 definitions and standards section of each.  
17 But the parts where I actually discuss my  
18 opinions, I authored.

19 Q. I understand. Thank you. And I  
20 believe you testified yesterday that the  
21 prior art you considered in formulating  
22 your opinions as to the state of the art  
23 were essentially the patents that were  
24 referenced in your report, and your general  
25 knowledge; is that correct?

1 MR. YAP: Objection.

2 Mischaracterizes.

3 THE WITNESS: I would say if we  
4 include all of the patents and all of the  
5 documents that were supplied as appendices  
6 to Yamaha's petitions among that as well.

7 I certainly reviewed prior art that  
8 might not have made its way into any of  
9 these documents, but I did not rely on that  
10 prior art in formulating these opinions.

11 (BY MR. ENGELLENNER):

12 Q. So do you have any recollection of  
13 this other contemporaneous or contemporary  
14 prior art?

15 And by that I mean, you know, prior  
16 art that you looked at that was in the  
17 public domain before, say, 2000 that did  
18 not find its way into either the Yamaha  
19 petitions or your expert declarations?

20 A. Well, the process involved the  
21 Yamaha's counsel doing a search, my doing a  
22 search. The result of that was a pool of  
23 references, which was larger than we could  
24 use.

25 I don't have specific references

1 that I can cite right now that came up in  
2 the search that are not somewhere cited in  
3 something, but I don't doubt that there are  
4 such references.

5 Q. And I believe you testified  
6 yesterday that as part of your services as  
7 an expert, you reviewed the petitions that  
8 were drafted by Yamaha's attorneys in these  
9 four proceedings; is that correct?

10 A. Yes.

11 Q. And you reviewed the claims charts  
12 that they drafted; correct?

13 A. I reviewed --

14 MR. YAP: Objection. Form.

15 THE WITNESS: I reviewed the  
16 petitions, including the claim charts and  
17 the appendices.

18 (BY MR. ENGELLENER):

19 Q. And I believe you testified that  
20 you didn't recall making any changes to the  
21 claims charts?

22 A. I don't recall suggesting any  
23 changes to the claims charts.

24 Q. Just to be clear, the claim charts  
25 were drafted by Yamaha's attorneys?

1 A. Yes.

2 Q. And to the extent that your  
3 opinions or your expert declarations  
4 reference these claim charts, were you  
5 essentially adopting the attorneys'  
6 arguments as to the claim charts?

7 A. Well, I had discussions with the  
8 attorneys prior to and presumably during  
9 the preparation of those claim charts. So  
10 we had discussions about various pieces of  
11 art.

12 And it may be more correct to say  
13 that our opinions converged, and the result  
14 is what I provide opinions about in my  
15 declarations.

16 Q. And so besides the references to  
17 the claim charts, your opinion's also  
18 amplified in some respects in the  
19 declarations; is that correct?

20 A. Well, I provide opinions regarding  
21 the claim charts, and I provide opinions  
22 regarding things that are not in the claim  
23 charts. Which I believe Yamaha then  
24 references my declaration in their petition  
25 in support of those arguments.



1 Q. Now, your C.V. suggests that you've  
2 been at MIT for virtually your entire adult  
3 life as a student, and as a teacher, and as  
4 a researcher.

5 Is that a fair characterization?

6 A. Yes.

7 Q. And you've never worked in industry  
8 full time?

9 A. Well, I had summer jobs in  
10 industry, but -- I have been involved in  
11 industry throughout that period, but not --  
12 not full time.

13 Q. And you've consulted on technical  
14 matters?

15 A. Yes.

16 Q. And have you ever consulted for a  
17 music company in the area of network  
18 media?

19 A. Not that I recall.

20 Q. And have you ever consulted  
21 specifically in the field of music file  
22 sharing?

23 A. Not that I recall. Except to the  
24 degree, as I noted yesterday, that it's  
25 possible to do a form of music file sharing

1 on the P.C. laptop; which I was involved  
2 in.

3 Q. And I believe you testified  
4 yesterday the major -- one of the major  
5 areas of research, your research at MIT,  
6 has been the field of interactive TV; is  
7 that correct?

8 A. Yes.

9 Q. Could you sort of just explain for  
10 me what interactive TV is?

11 A. Well, it's a somewhat flexible  
12 definition. But one of the ways to think  
13 about it is that it's television  
14 programming that has degrees of freedom in  
15 it that respond to user inputs.

16 And so while watching a television  
17 program, one might press a button on a  
18 remote control, or touch a touch-screen, or  
19 speak a voice command that performs some  
20 other action, and the result of that will  
21 be an augmentation or modification of how  
22 the material is presented or what material  
23 is presented.

24 Q. I'm not an abstract thinker, so I'm  
25 trying to think about what this actually

1 means.

2 If I was watching, you know, the  
3 Fox channel, and I watched the Fox News,  
4 and then I watched Modern Family, and then  
5 a Bart Simpson rerun, what would  
6 interactive TV provide me?

7 A. Well, I'll use two specific  
8 examples that we actually worked on. And  
9 one of them was a television program we did  
10 with Julia Child; who formerly resided in  
11 Cambridge, and with WGBH Television.

12 Where it was a cooking program that  
13 was in the form of a dinner party hosted by  
14 Julia Child. And Julia would bring out  
15 each one of the dishes and serve them to  
16 the guests.

17 The user, by means of a touch  
18 screen or another pointing device, could  
19 select a dish and then the program would  
20 expand to include Julia describing the  
21 preparation of the dish.

22 Or an interview of the line, or  
23 some other piece of ancillary information  
24 so that one could, simply by touching or  
25 selecting items in the video, which were

1        hyperlinks, change the presentation to  
2        include additional material of interest.

3                Another example we did was a  
4        television soap opera where all of the  
5        clothing, all of the furnishings, all of  
6        the props were items from the JC Penney  
7        catalog.

8                And the user while watching the  
9        program, could select any of the items,  
10       find out more information about them, and  
11       do a one-click purchase.

12               Q.    Okay.    When you're showing this  
13       supplemental content, this recipe or  
14       something for Julia Child, what's happening  
15       to the TV program itself?

16               A.    Well, that particular example was  
17       not meant to work with a live stream.    That  
18       would work with something that was either  
19       on demand or on a PVR, like a Tivo.

20                      So that there was recorded  
21       material, but different viewers might  
22       traverse the material differently, and some  
23       might see more of it, and some might see  
24       less of it.

25                      In other cases, it might simply be

1 graphical overlays. So the JC Penney  
2 example was all done by putting graphic,  
3 still or video graphic, overlays on top of  
4 the action, while the action proceeded.

5 Q. While the media proceeded. Okay.

6 I'd like to just refer you to what  
7 we've marked as Exhibit 11, which I believe  
8 is your patent.

9 Now, does this have to do with  
10 interactive TV also?

11 A. Yes.

12 Q. Could you sort of just give me a  
13 thumbnail sketch of what problem this  
14 patent is solving?

15 A. This is one of a family of patents.  
16 So I want to read this to determine which  
17 one it is.

18 Okay. This patent is associated  
19 with solving the problem of how to  
20 distribute interactive television content  
21 given existing distribution mechanisms for  
22 television, such as satellite and cable.

23 And the problem that we faced --  
24 and this was work that was done at  
25 Watchpoint Media, a start-up company that

1 spun out of my research group, the IP is  
2 now owned by Ericsson Television.

3 The problem we were trying to solve  
4 is that an interactive television program  
5 has multiple pieces. So first of all,  
6 there was the video or the audio akin to a  
7 non-interactive television program.

8 There was also the information that  
9 makes the program an interactive; which  
10 might be things like menus, graphics,  
11 additional videos, additional audio  
12 content. It might be metadata describing  
13 all of those elements. It might be  
14 synchronization information. It might even  
15 be pieces of computer software that are  
16 evaluated by the receiver in response to  
17 user actions.

18 In order to allow a user sitting in  
19 front of a television or other device to  
20 interact with the television broadcast,  
21 both the standard content and the  
22 interactive information need to arrive.  
23 And ideally they need to arrive in  
24 relatively close synchronization.

25 If the interaction information

1 arrives too late, then one clicks the  
2 button and nothing happens because the  
3 information associated with that hasn't  
4 arrived yet.

5 If it arrives too early, then the  
6 set-top box has to buffer huge amounts of  
7 interactive information in advance. And  
8 commercial set-top boxes for satellite and  
9 cable, particularly 10 years ago, didn't  
10 have all that much memory in them.

11 So the question is how do we make  
12 sure those things arrive in synchrony. The  
13 thought would be we just mash them all  
14 together and send them out. This is  
15 certainly possible.

16 One way to solve the problem is to  
17 imbed -- if you're using MPEG for a  
18 satellite or cable distribution, one can  
19 use what's called the private data area of  
20 MPEG to include the interactive  
21 information, and indeed they travel  
22 synchronized. You have the packets  
23 associated -- the video of the packet  
24 associated with the audio and the packet  
25 associated with the interactivity.

1           The problem is that a lot of  
2           existing television distribution systems,  
3           such as from networks, won't preserve the  
4           private data. So that means we can't  
5           necessarily have, say, FOX or ESPN or  
6           whomever insert all of the information and  
7           expect it will survive all the way to a  
8           cable or satellite head end, and ultimately  
9           to a viewer's receiver.

10           So in order to solve that problem,  
11           we proposed and in some circumstances one  
12           might have to insert the content locally,  
13           the interactive content. So as the  
14           television broadcast arrives at the head  
15           end, the head end has an automated server  
16           that looks at the incoming television  
17           programming and adds the appropriate data,  
18           which is then passed onto the viewers.

19           This patent, and another patent as  
20           well, are directed to making sure that the  
21           interactive content is associated in a  
22           well-synchronized fashion with the  
23           television programming.

24           And there are several problems that  
25           arise. One of them is that for various



1 reasons, perhaps because of transmission  
2 latencies, perhaps because the broadcaster  
3 changes the schedule, perhaps because a  
4 news bulletin comes up and interrupts the  
5 middle of the program and then it restarts  
6 10 minutes later, the head end inserter of  
7 the interactive information can't just  
8 blindly insert the information.

9 So this system enables the  
10 insertion to be based on when the  
11 programing actually arrives, not just based  
12 upon a hard-coded predetermined schedule.

13 Q. So would this be helpful in the  
14 example that you gave before, the JC Penney  
15 ad, that you wanted to also alert the  
16 viewer to what colors were available and  
17 how much they cost at the same time?

18 A. Right. So what could happen in  
19 that case is that we could say this soap  
20 opera is supposed to start at 2 PM. And so  
21 the local server, absent this invention,  
22 would just start adding in the interactive  
23 information to the incoming video at that  
24 hour of the day.

25 But what happens if there's a news

1       bulletin and the program starts late. Or  
2       what happens if a piece of the program  
3       isn't transmitted at all. You end up with  
4       a mess.

5                   So this is a system that would  
6       cause the correct information to be  
7       inserted, even if the programming arrives  
8       at a slightly different time or it has  
9       pieces missing. And ultimately, even if  
10      the programming schedule is changed by the  
11      broadcaster, this can adapt to that.

12                   And the other thing to note is that  
13      this is meant to be an automated process.  
14      So a person is not sitting there watching  
15      the television program coming in, and then  
16      selecting things from menus to be inserted.  
17      This should happen without significant  
18      human intervention.

19                   Q. So is it fair to say that this is  
20      not a trivial problem to add this  
21      supplemental content to this stream of  
22      media items?

23                   A. Well, I know it took a few of our  
24      programers several years to get it to work.  
25      So I'd say it's not a trivial problem.

1 MR. ENGELLENER: Let's turn to the  
2 '593 proceeding. And I'd like to walk  
3 through your declaration in that  
4 proceeding. That's Exhibit 2. And I'd  
5 like to review it in conjunction with  
6 Yamaha's petition; which is Exhibit 3. And  
7 the actual decision of the Patent Trial and  
8 Appeal Board to initiate a proceeding;  
9 which is Exhibit 4.

10 So if you could just have those in  
11 front of you, I'd appreciate it.

12 (BY MR. ENGELLENER):

13 Q. And what I'd like to do is identify  
14 those portions of your declaration that  
15 represent your opinions.

16 A. Okay.

17 Q. And in looking at it, it seems that  
18 paragraphs 1 through 7 are not opinions.  
19 They state your qualifications,  
20 credentials, et cetera.

21 And the materials you considered,  
22 and the standards that I believe you  
23 testified were explained to you by Yamaha's  
24 counsel; is that correct?

25 MR. YAP: Objection. The document

1 speaks for itself.

2 THE WITNESS: Yes.

3 (BY MR. ENGELLENNER):

4 Q. So Paragraph 8, that's an opinion;  
5 correct?

6 A. Yes. That was an opinion I was  
7 asked to provide by Yamaha's counsel.

8 Q. On a person -- or what -- who a  
9 person of ordinary skill in the art was;  
10 correct?

11 A. A person of ordinary skill in the  
12 art pertaining to the '952 Patent; yes.

13 Q. Okay. So let's come back to that.  
14 That's one opinion. I don't think  
15 Paragraph 9 has any opinions in it; does  
16 it?

17 A. It does, because I am -- I'm  
18 expressing my opinion that I'm qualified to  
19 provide opinions on the '952 Patent.

20 Q. Okay. My mistake.

21 A. So it's a meta opinion.

22 Q. Paragraphs 10 and 11 I think are  
23 basically a definition of your -- the  
24 patent and the tasks. So they wouldn't be  
25 characterized as opinions; would they?

1           A. Well, except to the degree that in  
2           the final sentence of Paragraph 11 I do  
3           note the agreement between the opinions I  
4           express and Yamaha's position in their  
5           petition.

6           Q. I stand corrected again. Thank  
7           you.

8                         Now, Paragraphs 12 through 14 I  
9           think get into a substantive opinion. And  
10          that is what the term "playlist assigned to  
11          an electronic device" means; is that  
12          correct?

13          A. As well as -- as it appears in  
14          Claim 9, and then some analogous but not  
15          identical elements that appear in other  
16          independent claims.

17          Q. Right. And is it fair to say that  
18          Claim -- I mean that Paragraph 13  
19          summarizes your opinion, that the word  
20          "assigned" should it be read to mean  
21          "transferred"?

22          A. Well, I would say "assigned to the  
23          electronic device" should be understood to  
24          mean "transferred to a particular device  
25          selected by the user, not just transferred

1 to a device".

2 Q. And do you understand that the  
3 Patent Trial and Appeal Board disagreed  
4 with that opinion?

5 I'd like to call your attention to  
6 Page 12 of the decision, and in particular,  
7 the full paragraph on that page. Oh,  
8 excuse me, Page 13, the full paragraph on  
9 that page. And just to save you some time,  
10 I'd just like to read the last sentence of  
11 that first part, that full paragraph. It  
12 says, "Thus, based on the record currently  
13 before us, we agree with the patent owner's  
14 proposal that the playlist is directed to  
15 rather than transferred to a device"?

16 A. Yes, that is my understanding.

17 Q. And now, coming back to your  
18 declaration. Paragraphs 15 to 18 seem to  
19 provide another substantive opinion.  
20 Again, it's a claim construction opinion, I  
21 believe, on the point of what does the term  
22 "at least once of a plurality of songs"  
23 mean; is that correct?

24 A. Well, I believe it's the complete  
25 phrase is "Wherein ones of a plurality of

1 songs are not stored on the electronic  
2 device." And so it's not specifically  
3 relating just to the plurality but to the  
4 storage of, or non-storage in this case, of  
5 ones in a plurality.

6 Q. Again, I stand corrected. Thank  
7 you. I missed that.

8 Is it fair to characterize your  
9 opinion on this that you believe that the  
10 claim required that there be at least some  
11 memory for storing songs on an electronic  
12 device to fall within the scope of the  
13 claim language?

14 A. Well, what I would say is that this  
15 language excludes the situation in which  
16 the device does not store songs.

17 Q. And are you aware that the Patent  
18 Trial and Appeal Board disagreed with your  
19 opinion on that?

20 A. Yes.

21 Q. Now, the next opinion I believe in  
22 your declaration is with regard to the  
23 Berman Patent. And I believe it's in  
24 Paragraph 19?

25 A. Yes.

1           Q. I was wondering if you could just  
2 summarize your opinion on Berman?

3           A. Well, I was asked for my opinion as  
4 to whether Claim 13 of the Berman Patent  
5 would have been obvious to one of ordinary  
6 skill in the art given the Berman  
7 reference.

8                   And it is my opinion that all the  
9 elements of 9, as disclosed by Berman, and  
10 this is as listed in the claim chart of the  
11 '952 petition, that Berman anticipates  
12 Claim 9.

13                   So the important point here is that  
14 it would have been well known to one of  
15 ordinary skill in the art in 2000 that  
16 music files could come from a Web server.  
17 And that was what I felt was the relevant  
18 issue here.

19                   And so one of ordinary skill in the  
20 art would know that, and therefore, one of  
21 ordinary skill in the art would conclude  
22 that Claim 13 would have been obvious in  
23 light of the Berman reference.

24           Q. So is it fair to summarize that  
25 your opinion in Paragraph 19 is that Claim



1 9 was anticipated by Berman and Claim 13  
2 was obvious over Berman?

3 A. Yes.

4 Q. Now, you didn't discuss two other  
5 claims that were raised in the petition and  
6 considered by the Board from the Berman  
7 Patent. I think that those are claims 10  
8 and 14. I'm wondering if that was an  
9 oversight, or if you had a disagreement  
10 with Yamaha's counsel on the invalidity of  
11 those claims?

12 MR. YAP: Objection. You can  
13 answer to the extent that you're not  
14 revealing any prior communications.

15 THE WITNESS: Well, I was asked --  
16 I was asked with respect to the Berman  
17 reference and the '952 Patent to provide  
18 opinions only on 13 and 9.

19 I can't speculate as to Yamaha's  
20 counsel's reasons for asking me to provide  
21 only those opinions.

22 (BY MR. ENGELLENNER):

23 Q. Okay. Good. So we'll come back to  
24 Berman 2, if you don't mind.

25 Let's continue through the rest of

1 the declaration. Paragraphs 20 and 21 deal  
2 with the Leeke Patent. And I was wondering  
3 if you could just summarize your opinion on  
4 Leeke?

5 A. Well, the opinion that I was asked  
6 for was whether Claims 9, 10, 13, and 14 of  
7 the '952 Patent would have been obvious in  
8 light of the Leeke reference given a  
9 particular construction of the term  
10 "playlist assigned to the electronic  
11 device."

12 And the construction that I'm using  
13 is the construction that I previously  
14 expressed my opinion on in Section 6 of  
15 this report. So I really give 2 opinions.

16 Because first I say that given a  
17 broad construction of the claim, which is  
18 the one that's used in Yamaha's '952  
19 petition, I think these claims are  
20 anticipated by the Leeke reference given  
21 the narrower construction of that term, the  
22 one that I discuss in this declaration.  
23 Its my opinion the claims would have been  
24 obvious in view of the Leeke reference.

25 Q. Could you, just to clarify, what

1 was your broader interpretation and what  
2 was your narrower interpretation of the  
3 claim?

4 A. So the narrower interpretation of  
5 the claim is the one where assigned -- the  
6 playlist aligned to the electronic device  
7 is construed as requiring the user  
8 selection of a specific device.

9 And the broader construction is the  
10 one that is discussed in the claim chart  
11 for Leeke in the Yamaha '952 Petition,  
12 which I reference here. And that is -- let  
13 me just find the correct page. So this is  
14 introduced in the '952 Petition on Page  
15 24.

16 Q. Okay. Now, are you aware that the  
17 Patent Trial and Appeal Board disagreed  
18 with your opinion, regardless of whether it  
19 was broader or narrower, and declined to  
20 institute a proceeding based on the Leeke  
21 Patent?

22 MR. YAP: Objection. The document  
23 speaks for itself. Outside the scope.

24 THE WITNESS: Right. I see in the  
25 decision that the Board did not agree that

1 Leeke anticipates or renders obvious the  
2 two that -- I'm sorry, Claims 9, 10, 13,  
3 and 14; the four claims that I discuss  
4 here.

5 (BY MR. ENGELLENNER):

6 Q. Okay. The next opinion I believe  
7 regards the Wolff Patent. And that I  
8 believe you can find on Paragraphs 22 to 24  
9 of your declaration.

10 Is it fair to say that your opinion  
11 on the Wolff Patent is that you agree with  
12 counsel's claim charts and that the claim  
13 charts demonstrate that Claims 9, 10, and  
14 14 were anticipated by Wolff?

15 A. Well, again, we have two different  
16 constructions. So this is analogous to my  
17 opinion on the Leeke reference. So we have  
18 the two different constructions; the  
19 construction that I proposed earlier in  
20 this declaration, and the broader  
21 construction which is discussed in the  
22 Yamaha petition and is also essentially  
23 patent owners' broad construction.

24 And so my opinion is that in the  
25 broad construction of the term, each of the

1 elements of Claims 9, 10, and 14 of '952 is  
2 anticipated by both. And under the  
3 narrower construction, mine, it's my  
4 opinion that claims would have been obvious  
5 in view of Wolff.

6 Q. And the narrow construction is that  
7 the term "playlist assigned to the  
8 electronic device should be construed as  
9 requiring user selection"?

10 A. Of a specific device. Which, in  
11 the Wolff reference, these devices are  
12 called network access appliances, or NAAs  
13 for short.

14 Q. Okay. We'll come back to Wolff. I  
15 think we're almost done here.

16 Paragraphs 25 through 27, is it  
17 fair to summarize your opinion in those  
18 paragraphs that you believed that Claims 9,  
19 10, 13, and 14 were obvious over what's  
20 been referred to as "the Lansonic  
21 reference"? And I apologize that I don't  
22 have that here today.

23 MR. YAP: Objection. The document  
24 speaks for itself. Outside the scope.

25 THE WITNESS: I believe my opinion

1 is regarding only Claims 9, 10, and 14 of  
2 '952. So only three of them.

3 But other than that, yes, it's my  
4 opinion that Claims 9, 10, and 14 would  
5 have been obvious to one of ordinary skill  
6 in the art in view of Lansonic.

7 (BY MR. ENGELLENNER):

8 Q. I'd like to call your attention to  
9 Paragraph 27, which I think also discusses  
10 Claim 13.

11 A. Okay. That's -- in that -- yeah,  
12 that's an additional opinion that I was  
13 asked to provide, which is a little bit  
14 different from the opinion that I provide  
15 on the other three.

16 But ultimately, I also find that  
17 one of ordinary skill in the art would have  
18 found Claim 13 obvious. So I have two  
19 different discussions here.

20 Q. Okay. And you're aware that the  
21 Patent Trial and Appeal Board declined to  
22 follow your opinion and did not institute a  
23 proceeding based on the Lansonic  
24 reference?

25 MR. YAP: Objection. The document

1 speaks for itself. Outside the scope.

2 THE WITNESS: That is my  
3 understanding, yes.

4 (BY MR. ENGELLENER):

5 Q. Now, finally the petition recites  
6 other grounds for invalidity. For example,  
7 anticipation by reference a patent issued  
8 to Cluts, et al. You don't appear to have  
9 addressed the Cluts reference. Was that  
10 because you had a contrary opinion?

11 A. I was not asked to discuss Cluts  
12 explicitly in this declaration.

13 MR. ENGELLENER: Okay. This might  
14 be a convenient time to break, if that's  
15 okay with you.

16 VIDEOGRAPHER: The time is 11:01  
17 AM. We are going off the record.

18 (Off the record)

19 (Back on the record)

20 VIDEOGRAPHER: We are back on the  
21 record. The time is 11:13 AM.

22 (BY MR. ENGELLENER):

23 Q. Dr. Bove, I'd like to return to  
24 your opinion on a person having ordinary  
25 skill in the art and ask you if Einstein

1 would have been a person of ordinary skill  
2 in the art of relativistic physics?

3 MR. YAP: Objection. Form.

4 THE WITNESS: Although I've taught  
5 a little bit of relativistic physics on  
6 occasion, I don't consider myself an expert  
7 on it. So I don't care to speculate as to  
8 how one would characterize a person of  
9 ordinary skill in the art.

10 (BY MR. ENGELLENNER):

11 Q. Well, would you say that a person  
12 like yourself, with a PhD, over 25 years of  
13 experience in the field, would you possess  
14 more than the ordinary level of skill in  
15 the art? And don't be bashful about being  
16 accurate.

17 A. Oh, I think I have more skill in  
18 the art than the hypothetical person of  
19 ordinary skill in the art that I describe  
20 in the -- in Paragraph 8 of this  
21 declaration. I think I'm qualified to  
22 understand what such a person's  
23 understanding would be.

24 Q. So would you agree that there are  
25 people who have extraordinary skill in the



1 art beyond what one would expect of someone  
2 of ordinary skill in the art?

3 MR. YAP: Objection. Form.

4 THE WITNESS: I think that would be  
5 fair to say.

6 (BY MR. ENGELLENNER):

7 Q. Okay. Let's, if we could, just  
8 return to Paragraph 8. And can you --  
9 Paragraph 8 of your declaration.

10 And I'm wondering if you can see  
11 the problem I'm having with the definition  
12 that you've preferred. My problem with it  
13 is that it's open ended in that a person of  
14 ordinary skill in the art could have more  
15 than a year of practical experience, in  
16 fact, many, many years of practical  
17 experience. And at some point would you  
18 agree that that sort of person would no  
19 longer be someone of ordinary skill?

20 A. Well, I think the relevant issue is  
21 would one what who had one year of  
22 practical experience and one who had more  
23 than one year of practical experience have  
24 the same understanding of the issues on  
25 which I opine in this declaration.

1                   And I believe that both people  
2           having sufficient experience would  
3           understand these issues in the same way.

4                   So I don't believe there's a first  
5           threshold that one crosses beyond which one  
6           has the understanding that I express here.  
7           And then there's a second threshold that  
8           one crosses some years beyond which one no  
9           longer has the same understanding of these  
10          issues.

11                   I think only the first threshold is  
12          relevant.

13                   Q.   But doesn't that pose a problem for  
14          determining obviousness because obviousness  
15          should be what is obvious to someone of  
16          ordinary skill in the art; not what is  
17          obvious to someone of extraordinary skill  
18          in the art?

19                   A.   Well, the problem there is that  
20          it's very, very difficult to establish the  
21          second to the point of the second  
22          threshold.  And if you say someone needs to  
23          have exactly one year of practical  
24          experience to be a person of ordinary skill  
25          in the art, does a person with one plus one

1 month no longer qualify? Or someone with 2  
2 years, or someone with 10 years?

3 So if we say we're going to create  
4 this hypothetical person who only has a  
5 Bachelor's degree and has worked for  
6 exactly 365 days with network multimedia,  
7 there aren't very many people like that and  
8 a new one disappears every morning.

9 So that's a problem. So that's my  
10 problem with attempting to make a  
11 closed-ended definition.

12 Q. But you would agree that at some  
13 point there needs to be a closed end if  
14 you're going to distinguish between someone  
15 of ordinary skill and someone of  
16 extraordinary skill?

17 A. It might have to be judged on a  
18 case-by-case basis. There may be people in  
19 the field for 30 years who are still  
20 ordinary, but -- so that's the other  
21 complication.

22 You know, I'm really looking at  
23 this from the perspective of saying what  
24 are the minimum qualifications one needs to  
25 have in order to achieve a particular

1 understanding of these issues, and not  
2 opining on what are the maximum  
3 qualifications one should have while still  
4 retaining that understanding. Because I  
5 think that's a very difficult judgment to  
6 make.

7 Q. But isn't it necessary to define  
8 that person to make the difficult judgement  
9 of what is obvious?

10 MR. YAP: Objection.

11 THE WITNESS: Well, as I've said, I  
12 understand this is a threshold, that there  
13 is a threshold one crosses at which point  
14 one has sufficient understanding to  
15 appreciate the issues and to form what I  
16 would regard as a correct opinion about the  
17 issues.

18 (BY MR. ENGELLENER):

19 Q. But you have no opinion as to where  
20 the other threshold is, where someone  
21 crosses from ordinary to extraordinary?

22 A. I have no such opinion.

23 Q. Okay. So let's talk about Berman,  
24 if we could. And I'd like to ask you to  
25 recall your testimony yesterday. I believe

1       you testified that the term "playlist"  
2       means a list of media items that may be  
3       selected to be played; is that correct?

4               MR. YAP:  Objection.  
5       Mischaracterizes.  Outside the scope.

6               THE WITNESS:  I know I testified  
7       it's a list of media items that may be  
8       selected.

9               (BY MR. ENGELLENNER):

10              Q.  Okay.  And I believe you gave two  
11       examples.  One was in the record industry,  
12       you said that it was your understanding the  
13       playlist was a list of records that a  
14       station manager would let the DJs play.

15              And you also had another  
16       definition, that there were automated  
17       playlist that would play without DJ  
18       intervention.

19              MR. YAP:  Objection.  Outside the  
20       scope.  Mischaracterizes.

21              THE WITNESS:  My recollection was  
22       that I was using this basically to  
23       characterize where the term comes from.  
24       And I believe I also expressed an opinion,  
25       that there are playlists associated with

1 playing digital media. But that the term  
2 originated with Top 40 radio.

3 (BY MR. ENGELLENER):

4 Q. Well, would you agree that there's  
5 two different concepts here? Definition A  
6 is a list with some intrinsic order that is  
7 arranged to be played in an order like this  
8 automated playlist. And Definition B that  
9 implies more of a catalog, I believe you  
10 said the universe of songs yesterday?

11 MR. YAP: Objection. Outside the  
12 scope.

13 THE WITNESS: Well, as I recall my  
14 testimony yesterday, I was not against the  
15 notion that any playlist has an order. By  
16 virtue of being a list it has an order  
17 because a list simply is an ordered  
18 sequence of elements.

19 What I was not willing to agree to  
20 was that it must be played in that order or  
21 that being played in the order is and  
22 inherent property of the list.

23 More generally I think being played  
24 in the order is a function of the software,  
25 or hardware, or whatever it is that

1 actually evaluates the data in the playlist  
2 and plays it.

3 So if you imagine a playlist for a  
4 DJ and a playlist for a automated radio  
5 station, they could be the same playlist  
6 but there are two different mechanisms.  
7 The DJ has judgment in esthetics and the  
8 automated system just goes in sequence one,  
9 two, three, four, five. But it could be  
10 the same list in both cases.

11 (BY MR. ENGELLENNER):

12 Q. So again, the term "playlist" comes  
13 from the broadcast industry; is that you're  
14 understanding?

15 A. My recollection, and this is not  
16 something that I've done a lot research in,  
17 but my recollection is that the term  
18 "playlist" originated with radio  
19 stations.

20 Q. Are you aware whether or not it's  
21 still used in the radio station industry?

22 A. Yes. And, in fact, there's a --  
23 what I do know is there's a distinction  
24 made between radio stations that have  
25 playlists and radio stations that don't.

1 The ones that don't are called free form  
2 radio stations. Lots of the local college  
3 stations around Boston fall under that  
4 category, to say they'll play anything.

5 Q. Does the term "playlist" have a  
6 different meaning in your mind in terms of  
7 digital media?

8 MR. YAP: Objection. Form.

9 THE WITNESS: Well, I think in the  
10 particular examples we discussed yesterday  
11 and we're discussing today the playlist is  
12 something that's consumer facing rather  
13 than something that's being used in a  
14 broadcast environment, typically. Although  
15 one might say that streaming radio stations  
16 likewise have playlists.

17 But the consumer may or may not see  
18 them or may or may not interact with them,  
19 depending upon the user interface that the  
20 streaming radio station has set up.

21 So in the examples we have here,  
22 both in the patents at issue and the prior  
23 art, a playlist is something where a user  
24 can make a selection of an item or multiple  
25 items to be played.



1                   So that's clearly different from  
2                   the playlist in a radio station where the  
3                   DJ could that but not the listeners.

4                   (BY MR. ENGELLENNER):

5                   Q.   So are you saying that in the art  
6                   that we've been talking about today and  
7                   yesterday, the term "playlist" refers to  
8                   selections that are arranged to be  
9                   played?

10                  A.   I might use those words and not  
11                  exactly the same order.   So they are  
12                  selections, items that may be selected for  
13                  playing, or one could say they are  
14                  selections in the same sense that at some  
15                  restaurants one has a wine list is that's  
16                  headed "wine selections."   And that doesn't  
17                  mean wine that have been selected; it means  
18                  wines that may be selected.

19                  Q.   So do you agree that we have two  
20                  possible definitions here for "playlist;"  
21                  one in which the items on the list are  
22                  arranged to be played in an order.   And  
23                  definition number 2, or B, a list of songs  
24                  that can be selected?

25                  A.   That seem to be roughly the

1 distinction between the two parties for  
2 post claim constructions for that term.

3 Q. Okay. So this definition B, the  
4 playlist is just a catalog. Did your  
5 declaration offer any opinion on this?

6 MR. YAP: Objection. The document  
7 speaks for itself.

8 THE WITNESS: Well, in this  
9 declaration I'm really dealing with the  
10 phrase "playlist" assigned to the  
11 electronic device. And the construction  
12 that I provide for that phrase does not  
13 contain the word "sequence" or the notion  
14 that the songs are played in sequence. It  
15 essentially says that the playlist is a  
16 list of songs.

17 (BY MR. ENGELLENER):

18 Q. So but were you asked or not asked  
19 to opine on whether "playlist" meant either  
20 what I was referring to as Definition A,  
21 arranged in an order to be played, or  
22 Definition B, a catalog of songs?

23 MR. YAP: Objection. Work product.  
24 You may answer.

25 THE WITNESS: The opinions that I

1 was asked to give are the opinions that  
2 appear in this document.

3 (BY MR. ENGELLENER):

4 Q. And so there's nothing in that  
5 document that would constitute an opinion  
6 that a playlist should mean a open-ended  
7 set of songs that can be selected to  
8 play?

9 MR. YAP: Objection. The document  
10 speaks for itself. Mischaracterizes  
11 testimony.

12 THE WITNESS: Well, as I said  
13 before, in construing the term "playlist  
14 assigned to the electronic device," I am  
15 necessarily making a statement about the  
16 playlist apart from the assignment.

17 And so if we parse the definition  
18 that I give in Paragraph 13 into two  
19 pieces, one dealing with playlists and one  
20 dealing with assignments, first of all, the  
21 word "sequence," or "arrangement," or  
22 anything like that does not appear there.

23 And so there is inherently in this  
24 definition, a definition of "playlist" is a  
25 list of songs.

1 (BY MR. ENGELLENNER):

2 Q. That's interesting because it would  
3 make the word "play" in your definition  
4 superfluous. If it was just a list of  
5 songs, you could just call it a list. But  
6 the word is "playlist." Does that denote  
7 anything different in your mind?

8 A. Well, I think the notion is that a  
9 playlist is something that can be acted  
10 upon. A list could be written on a piece  
11 of paper, or with chalk on a white board or  
12 something.

13 But I couldn't necessarily cause an  
14 apparatus to do something with that  
15 playlist without converting it into form.  
16 This playlist is clearly readable to humans  
17 as well as to software.

18 Q. And so what would that apparatus do  
19 with the playlist?

20 A. The apparatus presumably is going  
21 to present it to the user so that the user  
22 can make selections from it. The apparatus  
23 is going to respond to the user selections  
24 by obtaining those songs by one means or  
25 another and then it's going to play them.

1 Q. Now, this testimony that you gave  
2 yesterday and again repeated today, that  
3 the term was used in the record industry to  
4 simply mean a catalog of songs that can be  
5 selected.

6 Did your declaration provide any  
7 evidence supporting this recollection of  
8 how the term was used in the record  
9 industry?

10 MR. YAP: Objection. Outside the  
11 scope. Mischaracterizes testimony.

12 THE WITNESS: Well, I was not asked  
13 to address how it might be used in other  
14 contexts; I was asked to address how the  
15 term "playlist" might be construed in the  
16 broadest possible way consistent with the  
17 specification of each patent.

18 And what happened in the Top 40  
19 radio stations in the 1960s is perhaps not  
20 directly relevant to evaluating how one  
21 would use that term in the broadest  
22 possible way consistent with the spec of  
23 the patent.

24 (BY MR. ENGELLENER):

25 Q. Okay. Are there any facts in your

1 declaration that would support the notion  
2 that a playlist should mean a catalog of  
3 songs?

4 A. Well, I refer to a variety of  
5 places in the '952 Patent where the term  
6 "playlist" appears. So I have numerous  
7 citations on, for example -- or in, for  
8 example, Paragraph 14 of my declaration.

9 Q. But that paragraph goes to the  
10 question of how a playlist is assigned;  
11 does it not, and not what the playlist  
12 itself means?

13 MR. YAP: Objection. Compound.

14 THE WITNESS: Well, several of  
15 these citations also include discussions of  
16 how a user might interact with a  
17 playlist.

18 (BY MR. ENGELLENER):

19 Q. Now you're referring to the  
20 patent?

21 A. In the citations to the '952 Patent  
22 that I make in the -- in Paragraph 14 of my  
23 declaration. Although I do agree that the  
24 primary reason for making those citations  
25 is with respect to the assignment process

1       rather than user interaction.

2               Q.   So is there anything else in your  
3       declaration that would support the  
4       contention that a playlist is merely a  
5       catalog of songs?

6               MR. YAP:  Objection.  The document  
7       speaks for itself.  Mischaracterizes  
8       testimony.

9               THE WITNESS:  I don't see  
10       additional language in here addressing  
11       playlists in the declaration.

12               (BY MR. ENGELLENNER):

13               Q.   Thanks.  Now, I'd like you to look  
14       at the patent at issue again, the '952  
15       Patent, Exhibit 5, and ask you can you  
16       point to anything in that patent that would  
17       suggest that the inventor intended the term  
18       "playlist" to mean this open-ended set of  
19       media items that were not arranged to be  
20       played in an order?

21               A.   Well, probably the best definition  
22       of what the inventor -- inventors intend a  
23       playlist to be is given in Column 21 of the  
24       '952 Patent starting at Line 63.  Where it  
25       says a playlist, 1528, which is a list of

1 audio files and associated URLs of where  
2 the audio files were retrieved from.

3 So that sounds awfully like a  
4 definition and I don't see anything about  
5 playing in sequence there. And if I am  
6 looking for the broadest possible  
7 construction of that term consistent with  
8 the spec, I would look to that language as  
9 being an example of a very broad statement  
10 about what a playlist could be.

11 Q. Now, this paragraph you referred to  
12 says a playlist is a list of audio files  
13 and associated URLs. What is it that  
14 Qureshey does with this playlist?

15 A. Well, the claims of the Qureshey  
16 Patent '952 assign the playlist to an  
17 electronic device and determine which of  
18 the songs in the playlist aren't already  
19 stored there. And then provide the  
20 playlist to the electronic device and also  
21 provide information on how the device can  
22 obtain the missing songs.

23 Q. Now, I believe you testified  
24 yesterday that the shuffle function in  
25 another one of the Black Hills Media



1 patents suggested that the term  
2 "playlist" -- that the items in the  
3 playlist were indeed arranged to be played  
4 in order; is that correct?

5 MR. YAP: Objection. Outside the  
6 scope. Mischaracterizes testimony.

7 THE WITNESS: I don't recall  
8 testifying to that precisely. I think I  
9 may have testified that the shuffle means  
10 that they can be played in an order other  
11 than the order of the list.

12 (BY MR. ENGELLENER):

13 Q. But that suggests that the list has  
14 an intrinsic or original order?

15 A. Well, like all lists a playlist has  
16 an order.

17 Q. I'd like to direct your attention  
18 to Column 24 and Lines 38 through 44 of the  
19 '952 Patent and ask you the same question  
20 that was asked yesterday regarding the  
21 shuffle function. Does this passage imply  
22 that the items are arranged to be played in  
23 an order?

24 A. Well, it implies that they appear  
25 in an order and they can be played in the

1 order in which they appear, or they can be  
2 played in other orders as well.

3 Q. And just to be clear, I'd like to  
4 read into the record this passage. It  
5 says, "The user can click the shuffle  
6 button, 1796, to randomize the playlists as  
7 opposed to playing the playlist in the same  
8 order. Further, the user can press the  
9 repeat button, 798, in order to have  
10 continuous play as opposed to the playlist  
11 stopping when it runs out of songs to play.  
12 The playlist will typically start from the  
13 beginning."

14 So, again, do you agree or disagree  
15 that the items in Qureshey's playlist would  
16 have to be arranged in order to be played  
17 for this passage to make sense?

18 A. Well, AS I testified yesterday and  
19 again earlier this morning, a list has an  
20 inherent order. Whether or not that order  
21 is de-ordering which the items on the list  
22 are presented or played is a function of  
23 the mechanism that uses the list but not a  
24 function of the list itself.

25 What the player application does

1 with the list has more to do with the  
2 player application than the user than with  
3 the properties of the list.

4 Q. So how would it work if the  
5 Qureshey system had a playlist that wasn't  
6 arranged to be played in an order? How  
7 could one repeat or shuffle?

8 A. I think we might be talking past  
9 each other here, because nowhere do I deny  
10 that a list has an order. Nor do I deny  
11 that a list with an order can be played in  
12 that order.

13 What I am saying is that that's  
14 not -- the playing in an order is not part  
15 of the definition of "playlist." Playing  
16 in an order is a function of the player  
17 software.

18 Q. So the software, are you aware of  
19 any software or digital media player that  
20 has a playlist function that doesn't permit  
21 one to play the items in the list in a  
22 continuous fashion, one after another?

23 A. Well, not all of them will loop  
24 endlessly. But I think all of them will  
25 allow playing in sequence as displayed.

1           Q. I'd like to return to your  
2           declaration and again ask you, is this  
3           definitional dispute between an open-ended  
4           list and a list that's arranged to be  
5           played in the order, was that something  
6           that you specifically addressed in your  
7           declaration?

8           MR. YAP: Objection. The document  
9           speaks for itself.

10          THE WITNESS: Well, certainly in  
11          the two declarations we discussed yesterday  
12          I addressed it in detail. Here, I don't  
13          have an explicit discussion of playing in  
14          an order in the declaration that's before  
15          us right now, which is Exhibit 4 -- I'm  
16          sorry. Not Exhibit 4; Exhibit 2.

17          (BY MR. ENGELLENER):

18          Q. So your declaration in the '593  
19          Patent proceeding, the '593 proceeding on  
20          the '952 Patent, your declaration in that  
21          proceeding does not offer an opinion as to  
22          whether the term "playlist" should be  
23          construed one way or the other; does it?

24          MR. YAP: Objection. The document  
25          speaks for itself.

1 THE WITNESS: I was not asked in  
2 this declaration specifically to address  
3 the construction of just playlist; only the  
4 playlist assigned to the electronic  
5 device.

6 (BY MR. ENGELLENNER):

7 Q. And your declaration in the other  
8 proceeding that we'll talk about today, is  
9 that the same? You were not asked to  
10 address that either, that issue either in  
11 the '594 proceeding; is that correct?

12 MR. YAP: Objection. The document  
13 speaks for itself.

14 THE WITNESS: In the declaration  
15 addressing the '652 Patent, which is  
16 Exhibit 7, I was asked again to provide my  
17 opinion on the claim term "playlist  
18 assigned to the electronic device" but not  
19 just to the word "playlist."

20 (BY MR. ENGELLENNER):

21 Q. Thank you. Now, I believe you  
22 testified yesterday that you were not asked  
23 to review the claim charts, at least in the  
24 proceedings on the '099 Patent, and that  
25 you did not have any significant input into

1 the claims charts in Yamaha's petition in  
2 that case; is that correct?

3 MR. YAP: Objection.  
4 Mischaracterizes testimony.

5 THE WITNESS: I think that's a  
6 mischaracterization of what I testified.

7 (BY MR. ENGELLENER):

8 Q. So did you say you had significant  
9 input into the claim charts, or not?

10 A. Well, without going into specific  
11 detail about work product, certainly I  
12 identified items of art that came from my  
13 search. I looked at items of art that came  
14 from Yamaha's search.

15 There was overlap between the two.  
16 We had discussions about various items of  
17 art and which claim elements might or might  
18 not appear in which references. And it's  
19 entirely possible that some of those  
20 discussions resulted in information that is  
21 now in the claim charts.

22 But I can't point to a specific  
23 entry in a claim chart that I either  
24 authored or modified.

25 Q. So who authored the claim charts,

1 who drafted them?

2 A. The claim charts, as I understand,  
3 were authored by several of Yamaha's  
4 counsel.

5 Q. And you don't recall today changing  
6 any of those claim charts or recommending  
7 that they be changed in any way?

8 MR. YAP: Objection. Asked and  
9 answered. Work product. You may answer to  
10 the extent it does not reveal any work  
11 product communications.

12 THE WITNESS: I don't recall being  
13 given a draft claim chart that had already  
14 been prepared and suggesting changes to  
15 it.

16 (BY MR. ENGELLENNER):

17 Q. I have to ask a contrapositive  
18 question. Were you given a claim chart and  
19 made no changes to it?

20 MR. YAP: Objection. Work product.  
21 Same instructions.

22 THE WITNESS: I was given a draft  
23 claim chart and was on conference calls  
24 where elements in the claim chart were  
25 discussed. I did not record whether any of

1 the discussions in which I participated  
2 resulted in particular changes that came  
3 from comments I might have made during said  
4 conference calls.

5 (BY MR. ENGELLENER):

6 Q. And that's true for both the '972  
7 Patent and '652 -- '952 and '652?

8 A. The answer would be the same.

9 Q. Okay. Now, I'd like you to look at  
10 the Berman Patent, and in particular Figure  
11 1. And that would be Exhibit 12.

12 And I'd like you to -- well, my  
13 question is what is your understanding of  
14 Figure 1?

15 A. Figure 1 we are told in the Berman  
16 spec is a blocked diagram of a system which  
17 includes a playback unit and connections to  
18 a computer network and connections to a  
19 home audio system.

20 Q. Now, I believe your opinion on  
21 Berman was that all of the elements of  
22 independent claim 9 are disclosed in Berman  
23 as set forth in the claim chart contained  
24 in the '592 petition.

25 And so I'd like to refer you to the



1 petition in the claim chart in particular  
2 which begins on claim -- I mean on Page 17.

3 A. Okay. I have that.

4 Q. Now, on Page 18 the claim chart has  
5 two columns. And in the left-hand column  
6 it refers to our, quote, support of Claim 9  
7 that says, "receiving at the electronic  
8 device information enabling the electronic  
9 device to obtain the ones of plurality of  
10 songs from at least one remote source." Is  
11 that correct?

12 A. That's simply a claim element in  
13 Claim 9, yes.

14 Q. And on the page before the claim  
15 element where it says "receiving at the  
16 electronic device a playlist assigned to  
17 the electronic device, a playlist  
18 identifying the plurality of songs," that  
19 is a claim element?

20 A. Yes.

21 Q. And on the right-hand column on  
22 Claim 17, what is identified in this claim  
23 chart as the electronic device?

24 A. The playback unit 100.

25 Q. So referring back to Figure 1, that

1 would be what's shown in the large box and  
2 bears an arrow pointing to it that says  
3 "100"?

4 A. Yes.

5 Q. Now, again on Page 17 in the  
6 right-hand column, the second paragraph, it  
7 says, "The playback unit receives a song  
8 list from DUL server 107, which is  
9 identified above as directory and user  
10 list, DUL server;" is that correct?

11 A. Yes.

12 Q. So is it your position that this  
13 song list is the playlist referenced in the  
14 left-hand column of -- on Page 17?

15 A. Yes.

16 Q. But Berman uses the term "song  
17 list" rather than "playlist;" correct?

18 A. Well, not having a searchable copy  
19 of the Berman document in front of me, I  
20 can't say that it nowhere uses the term  
21 "playlist," but it does regularly use the  
22 term "song list."

23 Q. I'm sorry, I just meant in this  
24 passage in the claim chart.

25 A. Oh, just here?

1 Q. Yes.

2 A. In this claim -- in this claim  
3 chart the word "song list" is used because  
4 that's the phrase used in the Berman  
5 Patent, at least in some of the references  
6 like the ones cited here.

7 Q. Could you look at Figure 3 of the  
8 Berman Patent. And if it's helpful, the  
9 associated portion of the specification  
10 that is describing this figure. And that  
11 would be found beginning at the bottom of  
12 Column 6.

13 A. Okay.

14 Q. And can you describe for us what's  
15 going on in this Figure 3?

16 A. Figure 3 describes what happens in  
17 response to user commands from the point at  
18 which the playback unit is powered up. And  
19 when the playback unit is powered up, the  
20 user has the ability to select categories  
21 of music, or artists, or other bounds, if  
22 you will, on the music that will be  
23 available.

24 Then the playback unit communicates  
25 with the DUL server to determine whether or

1 not the song list that is in the playback  
2 unit is the most up-to-date version. If it  
3 is, nothing happens. If it isn't, the DUL  
4 server will provide an updated song list to  
5 the playback unit.

6           Once that updated song list arrives  
7 or once it has been verified that the  
8 existing song list is up to date, the user  
9 then has the ability to make selections  
10 from it.

11           When the user makes selections, the  
12 selection made goes back to the DUL server.  
13 The DUL server then provides a URL of the  
14 location where the song actually resides on  
15 the Internet.

16           Q. So the selection is occurring on  
17 the playback unit?

18           A. Or on the remote control. So the  
19 remote control replicates the graphical  
20 user interface with the playback unit.  
21 It's whatever can be done on the playback  
22 unit can be done on the remote control.

23           Q. Now, this song list updating  
24 function, is it essentially a  
25 synchronization of what's on the DUL and

1 what's on the playback unit?

2 A. Yes, but in order to make the  
3 communications efficient as possible, it  
4 first checks the version. It compares the  
5 version number of the song list that's in  
6 the playback unit with the version number  
7 of the song, most recent version of the  
8 playlist on the DUL. And it only  
9 synchronizes if they don't match.

10 Q. So isn't Berman just synchronizing  
11 sort of a catalog of songs at this point?

12 A. Berman is -- A significant portion  
13 of this flowchart doesn't really address  
14 anything that happens in the claims of the  
15 '952 Patent we're talking about.

16 So I'm not saying everything in  
17 this chart relates to a claim element in  
18 Claim 9, for example. But what we do see  
19 is that by step 310 there is a list of  
20 songs resident in the playback unit from  
21 which the user can select one or more  
22 songs.

23 The top half of this block diagram  
24 or flow chart just shows us the mechanism  
25 by which we get to step 310.

1 Q. Would you agree that the DUL in  
2 Berman does not send a playlist in the  
3 narrower context of a list of songs  
4 arranged to be played in an order to the  
5 playback unit?

6 MR. YAP: Objection to form.

7 THE WITNESS: Well, the list of  
8 songs on the song list certainly can be  
9 played in an order by the playback unit.

10 (BY MR. ENGELLENER):

11 Q. Is there anything in Berman that  
12 you can cite to that would suggest that the  
13 user can play the entire song list?

14 A. I believe I gave some testimony  
15 about this yesterday. But the fact that it  
16 has a skip button on the graphical user  
17 interface means that when we're playing a  
18 song, we can skip to the next song in  
19 sequence.

20 That would -- a skip button would  
21 only be meaningful if there were a sequence  
22 that the user understood and that songs  
23 would play absent of user interactions.

24 Q. But -- isn't it true that Berman  
25 allows a user to select from the song list

1 one or more songs?

2 A. Yes.

3 Q. And that all occurs after the song  
4 list has been verified as the most recent  
5 copy and is resident on the playback  
6 unit?

7 A. Yes.

8 MR. ENGELLENER: I think this  
9 might be a convenient time to break for  
10 lunch.

11 VIDEOGRAPHER: The time is 12:08  
12 PM. We are going off the record. This  
13 will be the end of disk 1 in the deposition  
14 of V. Michael Bove, Jr.

15 (Off the record)

16 (Lunch break taken)

17 (Back on the record)

18 VIDEOGRAPHER: We are back on the  
19 record. This is 1:08 PM. This is disk  
20 number 2 in the deposition of V. Michael  
21 Bove, Jr.

22 (BY MR. ENGELLENER):

23 Q. I believe right before we broke for  
24 lunch, Dr. Bove, you had indicated that  
25 Berman's song list could be played in its

1 entirety or in an order; is that correct?

2 MR. YAP: Objection.

3 Mischaracterizes.

4 THE WITNESS: That's my  
5 understanding.

6 (BY MR. ENGELLENER):

7 Q. Could you point to the  
8 functionality in Berman that would allow  
9 one to play the song list?

10 A. Well, I think probably the first  
11 language I'd point to would be language in  
12 Column 9 starting at Line 7, which does not  
13 speak directly to what interactions the  
14 user is having with the controls, but it  
15 does speak to the mechanism by which the  
16 system play the songs in sequence.

17 So in Column 9 starting at Line 7  
18 it says, "The system operating modes  
19 specify an algorithm for determining the  
20 next track." The normal mode specifies  
21 that the next track is the next sequential  
22 track in the selected compilation. And the  
23 random mode specifies that the next track  
24 is a randomly selected track in the  
25 selected compilation.



1                   So what that suggests to me is that  
2                   it is possible to, using the user  
3                   interface, specify that the system should  
4                   be in normal mode, for example. In which  
5                   case, when a track completes, it will play  
6                   the next track in sequences in the song  
7                   list.

8                   Q. Well, it doesn't actually say "song  
9                   list" here; does it? It says  
10                  "compilation"?

11                  A. Right. It uses the word  
12                  "compilation" here, but I take that to be  
13                  referring to the song list that's  
14                  displayed.

15                  Q. But isn't there an intermediate  
16                  step that's necessary here? And that being  
17                  that user, once they get a verification  
18                  that the song list is current, they must  
19                  select one or more songs, either a  
20                  compilation or a single song. But there's  
21                  no opportunity, as far as I can see, for  
22                  Berman's system to play the song list?

23                  MR. YAP: Objection. Compound.

24                  THE WITNESS: Well, we know that  
25                  the song list is displayed. We know that

1 the user may select one or more songs. And  
2 we also know that the system is capable of  
3 playing the displayed songs in sequence.

4 The Patent does not provide a lot  
5 of detail of exactly what the user does  
6 with the graphical user interface in order  
7 to did that.

8 Although I will note that the  
9 system -- the description of the system  
10 talks about how the playback controls  
11 should be similar to the playback controls  
12 that would be found on a CD player or a  
13 digital audio tape player.

14 And so I would expect -- this, an  
15 example of that is found at Line 56 of  
16 Column 3. Inasmuch as it would be known to  
17 an ordinary consumer that a CD player or a  
18 DAT player allows playing everything on a  
19 disk or a tape, I would expect that a  
20 replication of that interface would provide  
21 the same functionality with the material in  
22 the song list.

23 (BY MR. ENGELLENER):

24 Q. Well, your expectations not  
25 withstanding, is there anything in Berman

1 that would provide a functionality to play  
2 the song list?

3 MR. YAP: Objection. Asked and  
4 answered.

5 THE WITNESS: Well, I believe that  
6 would be determined in part by the control  
7 that establishes the system operating mode.  
8 And in part by the selection of at least  
9 the first song in the list.

10 But we're not told whether there's  
11 a control that specifically tells it to  
12 play only one song versus start playing at  
13 a particular point. But it does establish  
14 here that it is capable of playing a group  
15 of songs in sequence.

16 So presumably there is a control  
17 somewhere that enables that functionality.  
18 Otherwise, why implement that functionality  
19 in the software without providing a control  
20 to ask for it.

21 (BY MR. ENGELLENNER):

22 Q. Well, I guess that's my point. I'm  
23 not sure it's implemented at all. If I  
24 could just refer you back to Figure 3, Box  
25 310. It says, "user selects artist and

1 song title."

2 There doesn't seem to be any  
3 mechanism shown here for user playing the  
4 song list. But rather, it assumes the user  
5 is going to select a song.

6 MR. YAP: Is there a question  
7 pending?

8 (BY MR. ENGELLENER):

9 Q. I'm sorry. Is there a  
10 functionality besides selecting a song that  
11 I'm missing here in the patent that's shown  
12 in the drawing somewhere that would allow  
13 one to initiate a sequence of songs or play  
14 the entire song list?

15 MR. YAP: Objection. Asked and  
16 answered.

17 THE WITNESS: Well, we know that  
18 one can initiate a sequence of songs  
19 inasmuch as the language that I previously  
20 cited in Figure 9 describes how the system  
21 would go about operating given that the  
22 user had initiated playing a sequence of  
23 songs.

24 It does not necessarily describe  
25 exactly what the user does at the user

1 interface to initiate that process. But  
2 given that it discloses that process is  
3 happening, there must be a way to initiate  
4 it.

5 More particularly, there's nothing  
6 in the specification that says that a user  
7 is limited to only playing a subset of the  
8 displayed songs. But it does disclose a  
9 mechanism for playing an arbitrary number  
10 of songs in sequence.

11 (BY MR. ENGELLENER):

12 Q. Let me just digress to displaying  
13 function. You mentioned that the system  
14 could display the song list. And I'm not  
15 sure I see that in the patent either.

16 I see in Figure 2 there is a  
17 display of a single song, but can you point  
18 me to anything in the patent that would  
19 show a display of a song list?

20 A. Well, in Figure 2, buttons 222 and  
21 224 are what you might think of as the  
22 scroll up and scroll down buttons for the  
23 display. And inasmuch as we're told one is  
24 able to select a song from within the list,  
25 there has to be a way to get to a song

1 within the list.

2 And so I would presume that the  
3 user would use scroll up and scroll down to  
4 navigate through the list before selecting  
5 a particular displayed song.

6 Q. Okay. I'd like to direct your  
7 attention to Figure 5 and the flow diagram  
8 that shows how one would play a song. And  
9 there is a box 502 that's labeled  
10 "detecting new track event." Could you  
11 explain what that is?

12 A. A new track event is an event that  
13 triggers the playing of another song in  
14 some sequence.

15 Q. And I'd also like to direct your  
16 attention to Column 8, the -- and ultimate  
17 lines, and continuing on through the rest  
18 of the paragraph on the top of Column 9.  
19 It seems that the patent defines a new  
20 track events; does it not?

21 A. Well, it says that it is a user  
22 action such as selection of the play  
23 button, skip track button, or other button  
24 such as jump track, change disk, or the  
25 like.

1 Q. There's no play the song list  
2 button; is there?

3 A. Well, this is not a complete list  
4 of all of the buttons or all of the  
5 functionality provided on the user  
6 interface here.

7 Q. Okay. The next paragraph on Column  
8 9, that does seem to describe the  
9 functionality. It seems to me that there  
10 are three functions that are identified;  
11 the normal mode, the next mode, and the  
12 custom user mode. Could you explain what  
13 those three modes mean to you?

14 A. I think it actually is the normal  
15 mode, the random mode, and the custom  
16 mode.

17 Q. Again, I stand corrected. Thank  
18 you.

19 A. The normal mode strikes me as the  
20 scenario we've been discussing at length  
21 today, which is that there is some sequence  
22 in which item songs appear.

23 And this is simply describing that  
24 upon completion of one song, the next song  
25 that would be played is the one that

1 appears next in the sequence.

2 The random mode says that when the  
3 song finishes playing, a randomly selected  
4 song from the list appears.

5 And the custom mode says that there  
6 is a -- the user can program a sequence  
7 such as when the user records a program of  
8 track selection for playback in the  
9 programmed order.

10 And that implies that there are  
11 other ways of traversing a group of songs  
12 that are available to the user. And  
13 indeed, this implies that a program of  
14 track selections selected by the user can  
15 be played in a particular order specified  
16 by the user.

17 Q. But in each instance isn't this  
18 triggered by the user initiating a new  
19 track event?

20 A. Well, in the particular sequence of  
21 operations described in Figure 5, deciding  
22 the new track based on operating mode is a  
23 consequence of receiving a new track event,  
24 or detecting a new track event to be  
25 precise.



1           Q. So can you point me to anyplace in  
2 Berman where a user can initiate a sequence  
3 of songs to be played?

4           MR. YAP: Objection. Asked and  
5 answered.

6           THE WITNESS: Well, there is  
7 discussion under the memory buffering  
8 control portion of the specification in  
9 Columns 11 and 12 of how the system  
10 operates so that it can play song in a  
11 sequence, how it manages the memory  
12 buffers.

13           (BY MR. ENGELLENER):

14           Q. Okay. So let's look at that a  
15 little more carefully. It does say that  
16 the user can identify a song 1, and song 2,  
17 song 3, and can add more songs. But is  
18 there anything that's inherent in these  
19 buffers that would insist that the system  
20 automatically play one after the other,  
21 rather than perform the function that's  
22 shown in Figure 5, that is, await the  
23 initiation of a new track event?

24           MR. YAP: Objection. Compound.  
25 Asked and answered.

1                   THE WITNESS: Well, it seem to me  
2                   that it would not make sense for a user to  
3                   select three songs but then pressing the  
4                   play button only plays one of them and  
5                   stops. That's just nonsensical from a user  
6                   experience perspective.

7                   And further, given that the  
8                   discussion in Column 12 at the top in  
9                   particular is describing how while one song  
10                  is being played, the system starts  
11                  downloading the next song into memory so  
12                  that it's available even before the first  
13                  song completes.

14                  If the user wants to press skip.  
15                  My understanding of skip functionality, and  
16                  I talked about this a bit before, is that  
17                  if I hit the skip button, it immediately  
18                  jumps from one track to the next track that  
19                  would be played.

20                  If the system were not going to  
21                  play the next track, then it wouldn't make  
22                  sense to have a skip button.

23                  (BY MR. ENGELLENER):

24                  Q. But the skip button is one of the  
25                  events that is required before that next

1 song is played; correct?

2 A. Well, this whole section's  
3 introduced at the bottom of Column 11 by  
4 saying, "for example, if a user wants to  
5 hear song 1, and song 2, and song 3." Not  
6 if a user wants to hear song 1 but download  
7 songs 2 and song 3 -- songs 2 and 3.

8 So that implies that the user  
9 wishes to hear all three of these. So  
10 whatever the user is doing should result in  
11 the three of them playing. And the  
12 operation of the memory buffer management  
13 is consistent with enabling the system  
14 having all three songs available for  
15 playing in immediate sequence.

16 Q. But again, you haven't been able to  
17 point to anything in the specification that  
18 would show a functionality, as you just  
19 mentioned, of playing more than one song in  
20 a sequence?

21 MR. YAP: Objection. Asked and  
22 answered.

23 THE WITNESS: Well, no, actually  
24 I've pointed to functionality supporting  
25 the playing of multiple songs in sequence.

1       What I have said is that the specification  
2       does not specifically describe what the  
3       user does with the graphical user interface  
4       to initiate that action.

5                       (BY MR. ENGELLENNER):

6               Q.   Okay.  And all of this selection,  
7       and selecting tracks, and skipping songs,  
8       it all occurs after the user has either  
9       selected an artist or selected a  
10      compilation or a genre; is that correct?

11              A.   Well, it says user selects artist  
12      title, album genre, et cetera.  So the user  
13      selects something.

14              Q.   Okay.  But --

15              A.   The user could just be selecting a  
16      song list at that point.

17              Q.   Could be?  Does that make sense,  
18      that the system would be set up to play the  
19      entire song list without any user  
20      intervention here?

21              A.   No, I'm saying that the user would  
22      still have to perform some action to play  
23      it.  So there's a difference between  
24      selecting and playing.

25              Q.   Okay.  And that occurs in Figure 3

1 in box 310 that's labeled user selects  
2 artist and song title?

3 A. Yes.

4 Q. Okay. Now, back to the playlist,  
5 if I could, for just a minute. When you  
6 construed the term "playlist" assigned --  
7 excuse me. Strike that.

8 When you construed the term  
9 "playlist assigned to the electronic  
10 device" in your declaration, did you  
11 construe it from the point of the view of a  
12 person of ordinary skill in the art?

13 MR. YAP: Objection. Asked and  
14 answered.

15 THE WITNESS: That is the -- what  
16 the declaration says in Paragraph 13.  
17 Precisely what it says. It says my opinion  
18 is that one of ordinary skill in the art  
19 would understand that phrase in a  
20 particular way.

21 (BY MR. ENGELLENNER):

22 Q. I'd like to point your attention to  
23 Exhibit 11, your patent. Now, in your  
24 patent you also use the term "playlist;" do  
25 you not?

1 A. Yes.

2 Q. If it's helpful, I can point you to  
3 Column 3, the first full paragraph.

4 Now, in that paragraph it seem to  
5 me that you describe the playlist in a way  
6 that is consistent with the definition  
7 proposed by Black Hills Media, namely, a  
8 list of media items arranged to be played  
9 in an order; is that correct?

10 A. Well, "playlist" here is a list of  
11 media items that are played in order by the  
12 scheduling system.

13 Q. And, in fact, your system wouldn't  
14 work, would it, if they weren't arranged to  
15 be played in an order?

16 A. Well, being a list, it inherently  
17 has an order.

18 Q. We talked a little bit this morning  
19 about how this invention works in terms of  
20 being able to make sure that you keep your  
21 interactive television events in synch with  
22 the other media events that are being  
23 broadcast or being transmitted.

24 So doesn't the word "playlist" in  
25 your patent require that the media events

1 be arranged in an order to be played?

2 MR. YAP: Objection. Asked and  
3 answered.

4 THE WITNESS: Well, it's a list.  
5 The items are in an order, and the playlist  
6 is played in that order by the scheduling  
7 system.

8 (BY MR. ENGELLENER):

9 Q. Okay. I think that's the closest  
10 I'm going to get to you saying that they're  
11 arranged in an order to be played.

12 Let's move onto the Wolff Patent,  
13 if we could.

14 A. Are we finished with Berman for  
15 now?

16 Q. Yes.

17 A. I'm just trying to minimize my  
18 piles here. Which exhibit number is that?

19 Q. It's Exhibit 13.

20 A. Okay. Thank you.

21 Q. And I'd also like you to review  
22 your declaration and the petition, which  
23 are Exhibits 2 and 3, in conjunction with  
24 the Wolff Patent.

25 A. All right. You would like me to

1 look at my part of the declaration  
2 discussing Wolff?

3 Q. Yes, and the claim charts and the  
4 petition discussing Wolff.

5 A. Okay.

6 Q. Now, to begin with, can you confirm  
7 that you did not draft the claim charts in  
8 the petition that relate to Wolff?

9 MR. YAP: Objection. Asked and  
10 answered.

11 THE WITNESS: I did not draft this  
12 chart.

13 (BY MR. ENGELLENER):

14 Q. Do you recall having any  
15 significant input in preparing them?

16 MR. YAP: Objection. Asked and  
17 answered.

18 THE WITNESS: As I said earlier  
19 today, I recall being in discussions  
20 regarding the content of the claim chart  
21 but I don't recall specifically any  
22 instances of anything I might have  
23 suggested resulting in a change to the  
24 claim chart.

25 (BY MR. ENGELLENER):



1           Q. Thank you. In connection with  
2 perhaps Figure 2, can you give us a brief  
3 summary of what Wolff teaches in your  
4 opinion?

5           A. Well, in Figure 2 specifically,  
6 this is an illustration of how the  
7 invention enables accessing media objects  
8 on multiple devices.

9           Q. Okay. Maybe Figure 1 is a better  
10 overview of Wolff? Can you perhaps  
11 describe what is going on in Figure 1?

12          A. Figure 1 is a -- is really a  
13 network diagram of various elements that  
14 comprise an exemplary embodiment of the  
15 Wolff invention.

16                   And so there are network access  
17 appliances, NAAs. And NAAs such as 120, or  
18 125, or the unnumbered ones on the  
19 right-hand side of the diagram are able to  
20 connect to a network and to retrieve media  
21 objects from one or more servers such as  
22 element 105.

23                   Additionally, it's possible to use  
24 a another device, such as PDA 130, to, I'll  
25 use the exact language here, "to remotely

1 select a media object from a network access  
2 appliance."

3 Q. Now, network access appliance, is  
4 that a term of art that you're familiar  
5 with?

6 A. I believe that's a term that the  
7 inventors of this patent chose to use to  
8 describe their devices that access media  
9 over the network.

10 Q. Okay. Again, for my benefit, can  
11 you give me some idea of an example of what  
12 a network access appliance would be?

13 A. I would say a very broad definition  
14 of an NAA is given in Column 9 starting at  
15 Line 22 where it says, "It would be  
16 apparent to one skilled in the art that the  
17 NAA 410 can be any Internet-connected  
18 device capable of playing the media object  
19 of a compatible format."

20 Q. So would it be fair to say that  
21 this NAA has a Internet communications  
22 capacity, a media playing capacity, some  
23 storage, and some processor capabilities?

24 A. I think all of those would be fair  
25 to say.

1           Q. Okay. So now, referring to the  
2 petition. The claims charts drafted by  
3 Yamaha's counsel make reference to the NAA  
4 as, I believe, the electronic device used  
5 in Claim 9.

6           MR. YAP: Objection.  
7 Mischaracterizes testimony.

8           (BY MR. ENGELLENER):

9           Q. Okay. With reference to the claim  
10 chart that begins on Page 31, I'll try and  
11 rephrase the question. There is a first  
12 block that starts at the bottom of Page 31  
13 on the left-hand column, continues to the  
14 top of Page 32, in which an element of the  
15 claim is recited. And I'm going to recite  
16 it.

17                   "Receiving at the electronic device  
18 a playlist assigned to the electronic  
19 device, playlist identifying a plurality of  
20 songs wherein once the plurality of songs  
21 are not stored on the electronic device."

22                   Now, in the right-hand column the  
23 claims chart maps certain features in Wolff  
24 to that claim element; is that correct?

25           MR. YAP: Objection. The document

1 speaks for itself.

2 THE WITNESS: Yes, perhaps even  
3 multiple elements in that section of the  
4 claim.

5 (BY MR. ENGELLENNER):

6 Q. So does the claim chart equate the  
7 element referred to as the NAA, or network  
8 access appliance, with the electronic  
9 device as used in Claim 9?

10 A. I believe that's so.

11 Q. And so what we're looking for here  
12 is somewhere in Wolff where the NAA  
13 receives a playlist; is that a fair  
14 characterization of the claim chart?

15 MR. YAP: Objection. The document  
16 speaks for itself.

17 THE WITNESS: Well, this section  
18 describes the NAA and it also talks about  
19 language in Column 8, for instance, talking  
20 about playlist.

21 (BY MR. ENGELLENNER):

22 Q. Okay. Now, on Column 8 you do  
23 point out that the patent does say "user  
24 can create a playlist." Can you walk me  
25 through where that happens in the Wolff

1 system?

2 A. If the appropriate illustration is  
3 Figure 6 and the language describing Figure  
4 6 begins at Line 62 of Column 7 and extends  
5 almost all the way to the bottom of Column  
6 8.

7 Q. Now, this passage that you've cited  
8 refers not only to the NAA but also to a  
9 remote controller. Is that part of the  
10 NAA?

11 A. It's associated with the NAA but  
12 it's a separate device.

13 Q. So would it be a fair  
14 characterization to say that the playlist  
15 is actually created on a separate device,  
16 this remote controller, or I think it's  
17 sometimes referred to in the patent as a  
18 personal digital assistant or abbreviated  
19 as PDA?

20 MR. YAP: Objection.  
21 Mischaracterizes.

22 THE WITNESS: In this particular  
23 narration, the scenario described is the  
24 scenario of the user creating a playlist on  
25 the PDA or remote control and then

1 uploading it to the server.

2 (BY MR. ENGELLENER):

3 Q. Okay. And then does the PDA  
4 provide instructions to the NAA to play  
5 songs?

6 A. In this particular narration,  
7 specifically in Column 8, the scenario  
8 described is that of using the NAA to  
9 select songs or entire playlists and  
10 causing NAA to play them. But not all NAAs  
11 necessarily require a remote control in  
12 order to play songs.

13 Q. I believe you just said that this  
14 embodiment in Column 8 describes using the  
15 NAA to select songs or entire playlists?

16 A. I'm sorry. I should have said  
17 using PDA.

18 Q. PDA.

19 A. We have too many three-letter  
20 abbreviations here.

21 MR. YAP: Objection.

22 Mischaracterizes testimony.

23 (BY MR. ENGELLENER):

24 Q. So the playlist is created in this  
25 embodiment on the PDA?

1           A. In this particular embodiment the  
2 playlist is created on a PDA.

3           Q. And then individual songs or  
4 instructions to obtain songs are  
5 transmitted to the NAA; is that how it  
6 works?

7           A. Well, there are a lot steps that  
8 have been skipped in making that statement.

9           So what happens is the playlist  
10 then goes from the PDA to the server, 110.  
11 And then the NAA actually is going to play  
12 songs or the entire playlist.

13           What is described here is using the  
14 remote control to control the NAA when it's  
15 doing that. But the NAA goes up to the  
16 server and then down -- I'm sorry. The  
17 song list, or playlist rather, goes from  
18 the PDA to the server, and from the server  
19 to the NAA.

20           Q. Does the playlist go from the PDA  
21 to the NAA, or does just simply  
22 instructions to play media objects go to  
23 the NAA?

24           A. Well, given that we are told in  
25 Column 8 on Line 31 when the NAA has cached

1 the media objects by examining stored  
2 playlists, I take that to mean that the NAA  
3 has a stored playlist that it can  
4 examine.

5 Q. Forgive me, but that suggests the  
6 opposite to me, that the NAA does not have  
7 a playlist but rather it must examine a  
8 playlist that's stored on the personal  
9 server. Is that a plausible interpretation  
10 as well?

11 A. In order to examine it, it would  
12 have to read it off the server into its own  
13 memory.

14 Q. In your opinion, is that the only  
15 way the NAA could examine a playlist on the  
16 server?

17 A. Well, I'll note for example in  
18 Claim 16 which is slightly different from  
19 the embodiment we've just been looking at,  
20 this is a dependent claim but the relevant  
21 phrase is wherein the controller sends one  
22 playlist to the appliance to request the  
23 one playlist to be played by the appliance.

24 So that tells us two things. First  
25 of all, it tells us that the playlist is



1 capable of being received by the appliance.  
2 And second, that the playlist is capable of  
3 being played seemingly in its entirety by  
4 the appliance where the appliance, of  
5 course, is the NAA.

6 Q. I think that's a different  
7 embodiment than what we were talking about  
8 in Column 8?

9 A. Yes. I prefaced my answer by  
10 saying I think it's a different embodiment  
11 from the one we've just been looking at.  
12 But the presence of that claim does suggest  
13 two relevant things in the context of the  
14 '952 Patent.

15 Q. Would you agree that there's not  
16 much explanation provided in the Wolff  
17 Patent as to how the NAA goes about  
18 examining a playlist on a server?

19 MR. YAP: Objection. Asked and  
20 answered.

21 THE WITNESS: Well, I don't read  
22 that necessarily to say that it must  
23 examine it on the server. It says it's  
24 stored.

25 (BY MR. ENGELLENER):

1           Q. Okay. I'll rephrase the question.  
2           Is there much explanation of how Wolff's  
3           NAA examines a playlist stored on the  
4           server?

5           MR. YAP: Same objection.

6           THE WITNESS: No, there is not a  
7           discussion of how the NAA might go about  
8           examining a playlist that's stored on the  
9           server.

10          (BY MR. ENGELLENNER):

11          Q. And could Wolff's NAA examine a  
12          playlist, in your opinion, stored on the  
13          server and not receive it?

14          A. I don't see a teaching in this  
15          specification of how it might examine a  
16          playlist stored on a server without  
17          receiving it.

18          Q. But you see a teaching in the  
19          specification of how it would examine the  
20          playlist stored on the server and receive  
21          it?

22          A. Well, I would say that the sequence  
23          of events might be a bit different or the  
24          causality might be different. What I see  
25          is that it receives a playlist from the

1 server and then examines it.

2 Q. That's how you interpret this  
3 Column 8 passage; is that correct?

4 A. Well, where it says when the NAA  
5 has cached media objects by examining  
6 stored playlists, yes.

7 Q. Isn't it true that this underlying  
8 function that's described in Column 8,  
9 Lines 22 to 34 is to allow the NAA to cache  
10 media items for rapid playback?

11 A. Well, this particular discussion is  
12 in the context of caching the media  
13 objects. But I am using this simply to  
14 support the fact that the NAA itself has  
15 access to a playlist, and that I believe  
16 it's stored on the NAA. Both based on this  
17 language and based on language that  
18 admittedly is describing a different  
19 scenario in Claim 16.

20 Q. So is it your opinion that  
21 accessing and caching media items in the  
22 context of Wolff's system can only be  
23 achieved by the NAA receiving the  
24 playlist?

25 A. I think the specification is silent

1 on all of the possible ways in which that  
2 might be done.

3 MR. YAP: Counsel, sorry to  
4 interrupt. We've been going on for about  
5 an hour. So at a good point perhaps we can  
6 take a break?

7 MR. ENGELLENER: One more  
8 question.

9 (BY MR. ENGELLENER):

10 Q. Is there anything else in the Wolff  
11 Patent that suggests to you that Wolff's  
12 NAA receives a playlist?

13 MR. YAP: Objection. Asked and  
14 answered.

15 (BY MR. ENGELLENER):

16 Q. You've referred to Column 8, lines  
17 23 to 34, I believe, and to Claim 16?

18 MR. YAP: Same objection.

19 THE WITNESS: I don't right now see  
20 any additional language describing the  
21 storage of a playlist on the NAA.

22 MR. ENGELLENER: Okay. Thanks.  
23 Let's take a break now.

24 VIDEOGRAPHER: The time is 2:09 PM.  
25 We are going off the record. This will be

1 the end of disk 2 in the deposition of V.  
2 Michael Bove, Jr.

3 (Off the record)

4 (Back on the record)

5 VIDEOGRAPHER: This is disk number  
6 3 in the deposition of V. Michael Bove, Jr.  
7 We are back on the record. The time is  
8 2:25 PM.

9 THE WITNESS: Before we start, I  
10 just wanted to amend some testimony I gave  
11 earlier with respect to the Wolff  
12 reference. I may have implied the remote  
13 control is optional for controlling a PDA.  
14 But I just wanted to note on the record  
15 that all of the claims in the Wolff  
16 reference disclose a remote controller.

17 (BY MR. ENGELLENER):

18 Q. Okay. Thank you. I'd like to move  
19 onto the other proceeding now, and that's  
20 the '594 proceeding concerning the '652  
21 Patent.

22 And rather than dissect your  
23 declaration again for the opinions that  
24 were accepted and rejected by the Board,  
25 I'd like you to refer to the Patent Trial

1 and Appeal Board decision, which is Exhibit  
2 9. And in particular to Page 33.

3 MR. YAP: Objection.  
4 Mischaracterizes.

5 (BY MR. ENGELLENER):

6 Q. Do you have the decision and the  
7 declaration before you?

8 A. I do.

9 Q. Okay. So now on Page 33, the Board  
10 concludes in Section III, is it fair to  
11 characterize there being three grounds here  
12 that the Board has decided to initiate  
13 proceedings on?

14 MR. YAP: Objection. The document  
15 speaks for itself.

16 THE WITNESS: Here they're  
17 summarized with respect to three individual  
18 or combinations of references.

19 (BY MR. ENGELLENER):

20 Q. Okay. So the first issue is the  
21 applicability of the White Patent as an  
22 invalidating reference on obviousness  
23 grounds; correct?

24 A. Yes.

25 Q. Okay. Now, perhaps you could take

1 a look at the White Patent, which I believe  
2 is Exhibit 15.

3 A. Okay. I have that.

4 Q. Okay. Can you summarize what you  
5 believe White teaches?

6 A. Well, White has a variety of  
7 embodiments with a variety of features.  
8 They largely relate to being able to -- I  
9 will use the summary that's provided in the  
10 specification.

11 Essentially it allows a radio  
12 listener to work with playlists and to  
13 personalize them. But it does that in a  
14 variety of contexts and with a variety of  
15 embodiments.

16 Q. That sounds consistent with what  
17 you said in Paragraph 28 of your  
18 declaration in that you said White  
19 discloses numerous embodiments that include  
20 various features.

21 But I was wondering if you could be  
22 a little more explicit as to what it is  
23 about White that you find renders the  
24 claims obvious?

25 A. Well, I'll note that in my

1 declaration I refer to the claim charts of  
2 Yamaha '652 petition. And I can walk  
3 through those elements, or you can ask me  
4 specific questions about specific  
5 elements.

6 Q. Okay. So let's look at the  
7 petition. I believe the discussions of  
8 White begins on Page 51. The claim chart  
9 itself begins on Page 53.

10 Now, in your declaration you state,  
11 "It is my opinion that each of the elements  
12 of the claims disclosed in White is set  
13 forth in the claims chart contained in the  
14 '652 petition." And, again, for the  
15 record, this was a claims chart that was  
16 drafted by Yamaha's attorneys?

17 MR. YAP: Objection.

18 THE WITNESS: Yes.

19 (BY MR. ENGELLENER):

20 Q. And do you have any recollection of  
21 having any significant input into that  
22 claim chart?

23 MR. YAP: Objection. Asked and  
24 answered.

25 THE WITNESS: I think the process



1 was exactly the same process as I described  
2 with respect to the prior claim charts that  
3 we've discussed today.

4 (BY MR. ENGELLENNER):

5 Q. Okay. Now, with regard to the  
6 claim charts themselves, I'd like to call  
7 your attention to Page 54, and in  
8 particular to the left-hand column, again,  
9 where the claim elements are recited.

10 And more specifically to the box  
11 that's labeled III. When -- that section  
12 of the claim describes the playlist mode;  
13 does it not?

14 A. Yes.

15 Q. And we find very similar language  
16 to that that we've discussed this morning  
17 about receiving a playlist assigned to the  
18 electronic device; is that correct?

19 MR. YAP: Objection. Form.

20 THE WITNESS: Well, we do see  
21 language about receiving a playlist  
22 assigned to a device. So this is analogous  
23 to language we've discussed previously.

24 (BY MR. ENGELLENNER):

25 Q. But it also says from the central

1 system; is that correct?

2 A. This is Claim 1 we're referring to  
3 specifically. Yes, it uses that language  
4 in Claim 1.

5 Q. Okay. And if I could next refer  
6 you to the bottom of Page 56 and the top of  
7 57 where the claim chart dissects Claim 21.  
8 Again we see that same language, "receive a  
9 playlist assigned to the electronic device  
10 from the central system;" is that  
11 correct?

12 A. Yes.

13 Q. And the claim chart in this  
14 instance references back to "see Claim 1,"  
15 see Romanette 1 and Romanette 2? Or excuse  
16 me. It references back to the passage that  
17 we were just talking about "C" Romanette 3;  
18 correct?

19 A. Yes.

20 Q. And then on Page 58 of the petition  
21 with reference to Claim 42, once again I'd  
22 like to refer to part "C" and ask you if  
23 you again see that same language,  
24 "receiving a playlist assigned to the  
25 electronic device via a central system"? I

1 understand that there's a slight difference  
2 in grammar.

3 A. In this claim it does not use the  
4 word "playlist." But it says receiving  
5 information from the central system  
6 enabling the electronic devices to obtain  
7 the songs, in essence.

8 Q. I'm sorry, one box up.

9 A. Oh.

10 Q. "C". It says, "Wherein the desired  
11 mode of operation is the playlist mode."  
12 Little "i", "receiving a playlist assigned  
13 to the electronic device via a central  
14 system"?

15 A. Oh, okay. I see that one, yes.

16 Q. And again it references back to  
17 Claim 1C Romanette 3?

18 A. Yes.

19 Q. So all three of these independent  
20 claims have a common term, and they seemed  
21 to have been addressed in the petition a  
22 single time on Page 54; is that correct?

23 A. There is one reference to the  
24 White, or one set of references to the  
25 White Patent for that element that's used

1 for all these claims.

2 Q. Okay. There's two paragraphs there  
3 in the right-hand box that the claims chart  
4 appears to identify as matching the  
5 language of the claim that we've just been  
6 talking about; is that correct?

7 A. Yes.

8 Q. The first paragraph being --  
9 directing the reader's attention to Figure  
10 8, and in particular boxes 813 as well as  
11 807 and 808; is that correct?

12 A. Yes, as well as a reference to  
13 language in Column 16 of the spec.

14 Q. Yes. Okay. So let's take a look  
15 at that, if you don't mind. If you could  
16 just turn your attention to Figure 8.

17 So can you describe for me what is  
18 going on in these three boxes; 807, 808 and  
19 813?

20 A. Certainly. And I will also note  
21 the discussion of Figure 8 in detail begins  
22 at Line 62 of Column 15 and continues for  
23 several columns beyond that point.

24 So this overall diagram is a flow  
25 diagram of how one embodiment of the

1 invention provides audio information to  
2 electronic device. With respect to the  
3 three specific boxes or elements in this  
4 flow chart that are called out in the claim  
5 chart from the petition, the first one is  
6 element number 813.

7 And executing 813 is a consequence  
8 of the outcome of the decision box numbered  
9 805. So a diamond in a flow chart means a  
10 decision.

11 If the communication method  
12 available is wireless, then the then step  
13 to be executed will be 806, followed by 807  
14 and 808. If the communication method  
15 available is not wireless, than the next  
16 step executed will be box number 813.

17 In box number 813, playlist data is  
18 sent by means of a wired connection.  
19 Otherwise, the playlist information is  
20 formatted for wireless communication in box  
21 806.

22 Then box 807 wirelessly  
23 communicates the information to the device.  
24 And box 808 simply indicates the receipt of  
25 that playlist information at the remote

1 device.

2 Q. And overall, Figure 8 is describing  
3 the method of the patent in transmitting  
4 playlist data to be played; is that  
5 correct?

6 A. Well, it includes, to be specific,  
7 the user accessing a Web page where a  
8 playlist is created and then causing --  
9 after the user identifies or determines  
10 which destination device is to receive this  
11 playlist, the system then transmits the  
12 playlist and then ultimately executes the  
13 playlist.

14 So this includes everything from  
15 the creation of the playlist, through the  
16 transmission of the playlist, and finally  
17 the playing of the playlist.

18 Q. Okay. Let's start from the  
19 beginning of the flow chart, if you don't  
20 mind. And is it fair to say that at box  
21 802, that's the point where a playlist is  
22 created?

23 A. Yes, that's the point at which a  
24 playlist exists.

25 Q. And then the next box, what happens

1       there?

2               A.   In box 803, and we learn this in  
3       Column 16, starting at Line 11, that's  
4       where information required as part of the  
5       playlist is attained, such as URLs where  
6       the audio items exist.

7               Q.   It says obtain information  
8       associated with the playlist.  What does  
9       "information" mean to you in this  
10       context?

11              A.   Well, this says specifically, for  
12       example a list of network or URL locations  
13       comprised of the desirable audio  
14       information may be obtained.

15              Q.   So by box 804 you have the  
16       information necessary to play the songs; is  
17       that correct?

18              A.   Except for the fact that it hasn't  
19       been transmitted to the player yet, but the  
20       information has been assembled by 804.

21              Q.   And then the diamond you referred  
22       to, the decision block.  At that point the  
23       decision is being made to either transmit  
24       the information to a player via wireless or  
25       via a compression scheme and wirelessly to

1 a player; is that correct?

2 A. Not necessarily a compression  
3 scheme. But it will be transmitted either  
4 by a wired connection or by a wireless  
5 connection. And the wireless connection  
6 may involve more formatting.

7 Q. And that's what that box 806  
8 suggests to you; does it not?

9 A. Yes.

10 Q. That you're formatting the  
11 information and you're probably formatting  
12 it to compress it for wireless  
13 transmission; is that your opinion?

14 A. The discussion of that element does  
15 not speak of compressing. Specifically the  
16 discussion of 806 and 807 speaks for  
17 example that the device may have a limited  
18 amount of memory so the data may be  
19 transmitted in chunks rather than in its  
20 entirety.

21 Q. But at that point, whether it's  
22 being formatted or not, we're talking about  
23 audio data; are we not? The information  
24 necessary to play a song?

25 A. Well, it seems to imply that one



1 possibility is to send the audio  
2 information as well as the playlist.

3 Q. Why would there be any need to send  
4 the playlist to these players either  
5 wirelessly or hard wired instead of simply  
6 the audio data that they can then play?

7 A. Well, it gives examples such as a  
8 husband sending a romantic playlist to his  
9 wife on their anniversary. So apparently  
10 the inventors see a reason for sending the  
11 playlist and not use the audio data.

12 Q. I believe you're referring to  
13 Column 16 and Lines 30 through 34 where the  
14 patent says, "For example, the husband may  
15 want to send a romantic playlist to his  
16 wife on their anniversary. In this  
17 situation the husband would select his  
18 wife's electronic device as the receiving  
19 device for the selected audio information."

20 Now, that suggests, does it not,  
21 that what's really being transmitted is not  
22 the playlist, per se, but the audio  
23 information that's contained in the  
24 playlist?

25 A. Well, I see plain language here

1 that says a husband may want to send a  
2 playlist, not the contents of a playlist.

3 Q. I guess that's the point is what is  
4 the meaning of that language that you  
5 consider plain. Is the system at this  
6 point sending a playlist, or data that  
7 would execute the playlist?

8 MR. YAP: Objection. Asked and  
9 answered.

10 THE WITNESS: Well, what I would  
11 refer to is that in both the wired branch  
12 and the wireless branch of Figure 8 we see  
13 a step that says "execute playlist."  
14 Actually we see multiple steps that say  
15 execute playlist. We even see a step that  
16 says "buffer playlist."

17 So that suggests that what is being  
18 received and executed is, in fact, a  
19 playlist. Because one would not say  
20 "execute playlist" if what one were  
21 receiving was just a file that was the  
22 audio.

23 (BY MR. ENGELLENER):

24 Q. Why not? That sounds like a  
25 perfectly good shorthand way of describing

1 what's happening here, by saying "executing  
2 playlist" rather than says "executing the  
3 electronic data that's necessary to play a  
4 song"?

5 A. Well, except that the electronic  
6 data necessary to play a song, one would  
7 probably rewrite let's say box 810 or box  
8 814 to say "play song" or "songs;" not  
9 "execute playlist" if what was meant was  
10 play songs.

11 The fact that it says "execute  
12 playlist" implies that there is a playlist  
13 to be executed at that point in time.

14 Q. So on either of these branches from  
15 the decision .805 can you identify any  
16 reason why the playlist would need to be  
17 transmitted rather than the audio  
18 information?

19 MR. YAP: Objection. Asked and  
20 answered.

21 THE WITNESS: Well, to the degree  
22 that one might need an index to the songs  
23 rather than just the sequences of the  
24 songs, the playlist would provide the index  
25 to the songs which might allow further

1 interactions.

2 And some language that refers to  
3 this figure in Column 18, starting at Line  
4 20, it says, "In another embodiment the  
5 method of Figure 8 may be modified to allow  
6 a user to manipulate songs post download."

7 For example, a user may want to  
8 store, delete, replay, copy, forward, et  
9 cetera, received audio information. And  
10 that would be made simpler by having  
11 playlist and not simply having one big  
12 audio file that played from beginning to  
13 end. And that is referring to the same  
14 figure we've been discussing.

15 (BY MR. ENGELLENNER):

16 Q. I'm sorry, can you give me the  
17 citation to where?

18 A. Column 18, starting at Line 20.  
19 All right.

20 Q. Again, in that passage you just  
21 referenced, it's referring to audio  
22 information; is it not?

23 A. Yes, but as I said, the playlist is  
24 in essence an index to the audio  
25 information. And allowing the user to

1 perform those kind of operations would be  
2 made much simpler to having the playlist  
3 rather than just having one big audio file  
4 with all the music in it.

5 Q. But isn't that what's really going  
6 on in both of these branches, whether it's  
7 being played -- the songs are being played  
8 wirelessly or not, you're transmitting a  
9 big, or small, or whatever sized audio  
10 file; are you not?

11 MR. YAP: Objection. Asked  
12 answered.

13 THE WITNESS: Or potentially  
14 multiple audio files.

15 (BY MR. ENGELLENNER):

16 Q. There's a step in the wireless  
17 branch, 811, that refers to buffering the  
18 playlist. Does that make any sense unless  
19 you're talking about audio information  
20 rather than a list of songs?

21 A. Well, what I think that's referring  
22 to -- let's see. Step 811 is referring to  
23 a situation described starting at Column  
24 17, Line 9, where it's saying that a user  
25 may select a continuous communication of

1 selected audio information, left paren, EG,  
2 several hours of music, Internet broadcast,  
3 et cetera, right paren.

4 In the case like that, the  
5 information can't all be loaded in advance.  
6 So it's going to have to be loaded in chunk  
7 over time. So that buffering operation,  
8 811 in Figure 8, is talking about the  
9 embodiment where someone wants to listen to  
10 an extended broadcast. It's not the case  
11 we were talking about earlier.

12 Q. Isn't it the case we just referred  
13 to about having a very large audio file;  
14 isn't that why you would buffer?

15 A. Well, one possibility is that you  
16 would buffer because it's a large audio  
17 file. In another case it might be because  
18 you're listening to a live event.

19 And so the data have not all been  
20 generated at the time you start listening.  
21 So one would have to buffer in order to  
22 allow it to run continuously.

23 Q. Okay. But in any event, in either  
24 of those examples or in the passage that  
25 you just referred to, we're talking about

1 audio information and not a playlist; isn't  
2 that correct?

3 A. Well, when this section of the  
4 patent spec discusses audio information,  
5 it's not very specific about which part of  
6 the audio information might be the audio  
7 files and which part might be something  
8 else, like a playlist. It seems to refer  
9 to all of it collectively as audio  
10 information here.

11 Q. But as an expert in this field, if  
12 you were confronted with someone saying  
13 "buffer playlist," would you have any  
14 reason to think it's anything other than  
15 the audio data being stored in a buffer?

16 MR. YAP: Objection. Asked and  
17 answered.

18 THE WITNESS: Well, what I find  
19 arguing against that is the fact that at  
20 Line 11 in Column 17 it says the method may  
21 continuously play or execute the received  
22 audio information. And that suggests that  
23 some of the received audio information is  
24 audio information that's played. I regard  
25 that as music. And part of it is the audio

1 information that's executed, which I would  
2 regard as corresponding to the element  
3 execute playlist in Figure 8.

4 (BY MR. ENGELLENNER):

5 Q. Can you point to anywhere in this  
6 patent where the term "audio information"  
7 is used synonymously with "playlist"?

8 A. Well, I think one example is the  
9 language I've just referred to where it  
10 says that audio information may be played  
11 or audio information maybe executed.

12 And since this is referring to  
13 Figure 8, when I look at Figure 8, the only  
14 thing I see being executed is the playlist.

15 So connecting the dots, that tells  
16 me that the part of the information that's  
17 executed is the playlist part.

18 Q. Well, would you agree that you  
19 could connect the dots in another way and  
20 read "execute playlist" to mean receiving a  
21 audio data file and playing it?

22 MR. YAP: Objection. Asked and  
23 answered.

24 THE WITNESS: If that were the  
25 case, then it would be redundant to say



1 play or execute the information. Play or  
2 execute implies that some of the  
3 information is suitable for playing and  
4 other parts of the information are suitable  
5 for execution.

6 MR. ENGELLENER: If we can take a  
7 really short break. Maybe five minutes or  
8 so.

9 VIDEOGRAPHER: The time is 3:01 PM.  
10 (Off the record)

11 (Back on the record)

12 VIDEOGRAPHER: We are back on the  
13 record. The time is 3:13 PM.

14 (BY MR. ENGELLENER):

15 Q. Dr. Bove, I'd like to move on to  
16 the next ground on which an interparty's  
17 review was initiated in the '594  
18 proceeding. And that, again, is on Page 33  
19 of the decision.

20 And it involves a large number of  
21 claims and a preliminary conclusion that a  
22 reasonable likelihood has been found that  
23 they are obvious over the combination of  
24 Qureshey and Berman. Is that your  
25 understanding?

1           A. Yes, this is the second of the  
2 three grounds that we mentioned earlier.

3           Q. So with regard to your declaration  
4 on that point, I'd like to call your  
5 attention to Paragraphs 21 through 23.

6                   And in Paragraph 21 I believe you  
7 opine that someone skilled in the art would  
8 have found it obvious to combine the audio  
9 on demand aspect of the Berman reference  
10 with the system disclosed in the Qureshey  
11 reference, which I think we agreed to be  
12 calling the Qureshey PCT application. Is  
13 that a correct summary of your conclusion  
14 in Paragraph 21?

15           A. Yes.

16           Q. And Paragraph 22 is the reasoning  
17 for why these two references would be  
18 combined; is that correct?

19           A. Yes.

20           Q. And so I believe you've opined that  
21 one of ordinary skill in the art would have  
22 understood that the same network interface  
23 could be used for connecting to audio on  
24 demand as well as Internet radio services;  
25 is that correct?

1 MR. YAP: Objection. The document  
2 speaks for itself.

3 THE WITNESS: Yes.

4 (BY MR. ENGELLENNER):

5 Q. Could you just expand on that a  
6 little bit for me? What would lead someone  
7 skilled in the art to connect audio on  
8 demand and Internet radio services?

9 A. Well, I'm not connecting audio on  
10 demand to Internet radio services. I'm  
11 saying that a client device with a network  
12 interface would be able to use the same  
13 network interface to connect to either  
14 service.

15 Q. Is there any motivation to combine  
16 these, in your mind?

17 A. Well, it's actually not combining  
18 -- the two network interfaces are  
19 essentially the same thing. I'm saying the  
20 network interface disclosed in either of  
21 these references could connect to both  
22 kinds of services on the Internet.

23 Q. And is it your opinion that someone  
24 skilled in the art could modify the user  
25 interface software to allow selecting

1 between these two functions?

2 A. Yes.

3 Q. And we're using the terms "audio on  
4 demand" and "Internet radio" as shorthand,  
5 I believe, for what's in the claims. But  
6 could you describe for me what you  
7 understand "audio on demand" to mean and  
8 what "Internet radio" means?

9 A. Well, in this particular domain  
10 we're talking about, for example, Claim 1  
11 of the Patent at issue in this discussion,  
12 there are Internet radio broadcasts, which  
13 are essentially continuous streams.

14 So it's akin to listening to the  
15 radio except that instead of using a radio  
16 advice, one's PC or other playback device,  
17 is simply connecting via the Internet wire  
18 to wirelessly to a source of such a  
19 broadcast, which is then being transmitted  
20 over the Internet to the receiving device.

21 The audio on demand is what we've  
22 been talking about in terms of a playlist  
23 or even just downloading an individual song  
24 from a server and then playing it.

25 Q. Okay. And someone skilled in the

1 art would have found some advantage in  
2 combining the two of them?

3 A. Oh, one skilled in the art would  
4 have understood that this would expand the  
5 functionality of the device with  
6 predictable results with minimal  
7 modification needed.

8 Q. And you reached this opinion  
9 considering what a person of ordinary skill  
10 in the art was at the time?

11 A. As well as considering what is  
12 disclosed in these two references.

13 Q. But as to the person having  
14 ordinary skill in the art in this field, we  
15 still don't know whether that means someone  
16 that has one year experience or 25 years'  
17 experience; is that right?

18 A. Well, I think the relevant point is  
19 that someone with a year of experience in  
20 network multimedia would understand the  
21 same network interface could be used for  
22 both services.

23 And similarly, one with that amount  
24 of practical experience in network  
25 multimedia would understand what would be

1 involved in allowing a single piece of  
2 software to access both services through  
3 the same user interface, and using the same  
4 network interface as well.

5 And I think that's the relevant  
6 point, that somebody I've described, with  
7 minimal qualifications that I've described  
8 to be a person of ordinary skill in the  
9 art, I think would carry enough experience  
10 to know that.

11 Q. Okay. And with regard to the  
12 Berman reference, I believe the claims  
13 charts that are in the petition make  
14 reference to the Berman Patent as having  
15 disclosed the feature of receiving a  
16 playlist? The language that we just  
17 discussed in connection with the White  
18 reference.

19 A. Right. And I think earlier today  
20 we also had discussion about the fact that  
21 the Berman reference uses the term "song  
22 list" instead of "playlist."

23 Q. And can we agree that to the extent  
24 that you gave testimony this morning  
25 regarding what you understood the term

1 "playlist" to mean in connection with the  
2 '952 Patent applies equally to the '652  
3 Patent?

4 MR. YAP: Objection to form.

5 THE WITNESS: Certainly for  
6 purposes of anticipation or obviousness of  
7 this claim element, yes.

8 (BY MR. ENGELLENER):

9 Q. I'm just trying to reduce the  
10 amount of time that we have to go over  
11 Berman again. And if there's an agreement  
12 on your part that your testimony on Berman  
13 is equally applicable to this second  
14 patent, then we can move on.

15 A. Okay. I'm happy to specify that  
16 it's equally applicable and that I would  
17 cite the same language in Berman in either  
18 case.

19 Q. Thank you. Okay. So I'd like now  
20 move on to the third ground on which the  
21 '594 review proceeding was initiated. And  
22 that's also found on Page 33 of the  
23 decision.

24 And I believe this ground is one of  
25 obviousness over Qureshey, Berman, and

1       Leeke; is it not? As applied to Claims 11,  
2       32 and 53?

3             A. Well, I say several different  
4       things, but I am addressing Claims 11, 32  
5       and 53 with regard to the obviousness of  
6       combining the features of Qureshey and  
7       Berman that we previously discussed.

8             And to that I'm adding that it  
9       would have been -- claims 11, 32, and 53  
10       would have been obvious in view of that  
11       combination further in view of Leeke.

12            Q. And what is the feature that you  
13       identified in Claims 11, 32, and 53 as  
14       requiring the addition of this third  
15       reference, Leeke?

16            A. Claims 11, 32 and 53 describe  
17       supplemental information related to a song  
18       being received and displayed in response to  
19       a request.

20            Q. And what's your understanding of  
21       supplemental information; can you give me  
22       an example of what supplemental information  
23       might be?

24            A. Let me just get the relevant patent  
25       in front of me first.



1           So I take this to refer to, as one  
2           example, language in Column 30 of the '652  
3           Patent. And so starting at Line 43, this  
4           says, "After the action button 1210 is  
5           pressed, the menu buttons 1821-1825 change  
6           context to perform functions that provide  
7           additional information on the given audio  
8           source and artist.

9           "Further, after the action button  
10          1210 is pressed, the artist will no longer  
11          be shown as unknown because the audio  
12          source will be uploaded to a server for  
13          analysis to determine the identification of  
14          the artist. The server will download the  
15          identity of the artist in addition to other  
16          information concerning the audio source."

17          So what this describes, more  
18          examples in the following paragraphs, but  
19          that is scenario is one where a user is  
20          listening to an audio broadcast and the  
21          artist is not -- the artist information has  
22          not been transmitted, the user can press a  
23          button and then cause the artist to be  
24          identified.

25          There are other sorts of

1 information, including toward the bottom of  
2 the column, information will be presented  
3 to the user of current events regarding the  
4 artist and/or the given audio source.

5 And then it talks about up-to-date  
6 information on tours the artist is going  
7 on. It talks about offers, and promotional  
8 items, and merchandise associated with the  
9 artist.

10 So it's a very broad range of  
11 possibilities of supplemental information  
12 that could be presented in response to the  
13 request.

14 Q. This sounds an awful lot like the  
15 interactive TV function that we talked  
16 about this morning, you know, with JC  
17 Penney and providing additional  
18 information. Does that sound similar to  
19 you?

20 A. It's certainly analogous in  
21 appearance to the user, not necessarily in  
22 the structures that perform it.

23 Q. So the supplemental information can  
24 be audio, or visual, or even video?

25 A. Well, here it says that it's

1 displayed in response to a request.

2 Q. So at least visual or video?

3 A. The discussion of that portion of  
4 the spec that I take to describe Claims 11,  
5 32 and 53 speaks of using the display on  
6 the device.

7 Q. So if I could just refer you to the  
8 claim language of these claims that we're  
9 talking about, 11, 32 and 53. There is a  
10 common thread, I believe, in these claims  
11 in that they each call for a step of  
12 sending a request to a remote server for  
13 supplemental information relating to the  
14 song in real time while the song is  
15 playing. And then receiving supplemental  
16 from the receiver. Is that your  
17 understanding as well?

18 A. Yes, that is my understanding.

19 Q. And in two of the three claims  
20 there's also a third step of -- excuse me.  
21 In all three of the claims there's a third  
22 step of presenting the supplemental  
23 information to the user of the electronic  
24 device. Is that correct also?

25 A. Yes.

1 Q. So in your opinion, Leeke supplies  
2 the missing piece here, the language that I  
3 just read; is that correct?

4 A. Yes. So I don't see the display of  
5 supplemental information in the combination  
6 of Qureshey and Berman that we discussed  
7 previously. But I've been asked to provide  
8 my opinion as to whether one could use that  
9 element of Leeke to provide the missing  
10 element for Claims 11, 32, and 53.

11 Q. Now, you just mentioned the last of  
12 those three steps that is presenting the  
13 supplemental information to the user. But  
14 the other two steps as well?

15 A. Yes. So the request, the providing  
16 the supplemental information, and then the  
17 displaying.

18 Q. Okay. So can you point me to where  
19 in the Leeke reference we find this missing  
20 link?

21 MR. YAP: Objection. Form.

22 THE WITNESS: One example would be  
23 in Figure 9 of the Leeke reference. And  
24 there is a button, or 402, which says "more  
25 info." And when the user presses that

1 button, additional information is fetched  
2 and displayed.

3 (BY MR. ENGELLENER):

4 Q. What did you mean by "fetched"?

5 A. Well, this discussion talks about  
6 certain buttons such as 402, or 404, or 406  
7 where it says there's a user-initiated  
8 event that displays more information. But  
9 the fact that the additional information on  
10 the display can come from an Internet  
11 server is described in the next paragraph  
12 where it talks about having a hyperlink to  
13 a destination in the electronic network,  
14 such as to a home page of a radio station.

15 Q. And you're referring to where in  
16 the specification?

17 A. This is Column 14. Really we're  
18 going from about Line 30 to about Line  
19 51.

20 MR. ENGELLENER: Can we take a  
21 brief break?

22 VIDEOGRAPHER: The time is 3:38 PM.  
23 We are going off the record.

24 (Off the record)

25 (Back on the record)

1                   VIDEOGRAPHER: We are back on the  
2 record. The time is 3:38 PM.

3                   (BY MR. ENGELLENNER):

4                   Q. Now, in this context, Figure 9 in  
5 the passage that you've just pointed us to,  
6 Column 14, Lines 30 through 61 or 64 -- or  
7 excuse me, 51. Does this disclose sending  
8 a request in real time while the song is  
9 playing?

10                  A. Yes. Logo 410 acts as a control to  
11 initiate a hyperlink to a destination in  
12 the electronic network 100.

13                  Q. I'm sorry, I'm not quite sure how  
14 that sentence you just read implies that  
15 it's occurring in real time?

16                  A. Well, it's a button. I can press  
17 it at any time and it will display the  
18 information provided at the hyperlink.

19                  Q. But is it occurring while the song  
20 is playing?

21                  A. Well, Figure 9 shows a song now  
22 playing. And it also shows that content  
23 element. So I take that to mean that that  
24 content element is present while a song is  
25 playing.

1 Q. So in your opinion, is initiating a  
2 hyperlink the same as requesting -- sending  
3 a request to a remote server for  
4 supplemental information?

5 A. Yes.

6 Q. So I'd like to return to the issue  
7 of obviousness and ask you again to explain  
8 why someone skilled in the art would have  
9 combined Leeke's feature that you just  
10 described with the Internet radio and the  
11 audio on demand functions that we discussed  
12 previously?

13 MR. YAP: Assuming that's a  
14 question, objection. Asked and answered.

15 MR. ENGELLENER: Okay. I'll  
16 rephrase it.

17 (BY MR. ENGELLENER):

18 Q. Could you explain to me why, in  
19 your opinion, it was obvious to combine  
20 Leeke with the other references to arrive  
21 at this supplemental information function  
22 as well as audio on demand and Internet  
23 radio in one system?

24 MR. YAP: Objection. Asked and  
25 answered.

1           THE WITNESS: Well, there are a  
2       variety of reasons I can provide which  
3       would include at least the fact that the  
4       diagram we have been talking about, a group  
5       of diagrams really in Qureshey showing  
6       various interactions -- let me call up the  
7       specific.

8           So Qureshey has a display that's  
9       able to provide additional information  
10      about a piece of music. And we've already  
11      talked about that.

12          And Berman has a touch screen  
13      display which can provide information and  
14      has reconfigurable buttons. And it is also  
15      a device for playing music.

16          And Leeke is also a music-playing  
17      device with a screen displaying information  
18      about the music.

19          So it's really a question of where  
20      does the supplemental information come  
21      from. And Leeke discloses that the  
22      supplemental information can come from a  
23      server when the button is pressed.

24          Now, we've already seen that  
25      Qureshey and Berman are connected to the



1 Internet. So their network interface that  
2 we've discussed previously is capable of  
3 connecting to the Web server that's  
4 providing the supplemental information as  
5 in Leeke.

6 They have similar displays.  
7 They're addressing similar fields or  
8 similar functions. And the only thing that  
9 Leeke really adds is that the information  
10 that's displayed on the display in response  
11 to the user touching a particular portion  
12 of the display comes from a Web server.

13 But all of -- the other two  
14 references are capable of talking to a Web  
15 server. And the other two references have  
16 a very, very similar display to that in  
17 Leeke.

18 (BY MR. ENGELLENER):

19 Q. So in your expert declaration you  
20 offer very little explanation for why one  
21 skilled in the art would combine these  
22 references, other than to say that the  
23 combination is simply applying a known  
24 technique to a known device. Isn't that  
25 correct?

1 MR. YAP: Objection. The document  
2 speaks for itself.

3 THE WITNESS: Yes. What I'm saying  
4 is it would have been obvious to one of  
5 ordinary skill in the art to provide  
6 supplemental information on Berman as is  
7 done on Leeke because that is a known  
8 technique.

9 (BY MR. ENGELLENNER):

10 Q. But you don't explain in the  
11 declaration what that known technique was;  
12 do you?

13 MR. YAP: Same objection.

14 THE WITNESS: The known technique  
15 is the provision of supplemental  
16 information in response to a request.

17 (BY MR. ENGELLENNER):

18 Q. And, again, you reached this  
19 opinion based on your understanding of what  
20 a person having ordinary skill in the art  
21 at the time in the field would have  
22 concluded?

23 A. Yes. One with ordinary skill in  
24 the art in the area of network media would  
25 have that understanding, in my opinion, as

1 of that date.

2 Q. And are we talking about the  
3 one-year experienced person, or the 10-year  
4 experienced person?

5 A. Let's say the at-least-one-year  
6 experienced person, because it's a matter  
7 of having sufficient experience to know how  
8 to do this.

9 Q. I don't think that helps. If the  
10 one-year person -- if the person that  
11 you're thinking of has 10 years of  
12 experience, then they may not be ordinary  
13 skilled in the art.

14 A. Well, but as I said, the one-year  
15 person, in my opinion, would have  
16 sufficient experience and understanding to  
17 find that obvious. And that obviousness  
18 would not decline with more experience.

19 Q. So when I asked you what the known  
20 technique was, I think you simply answered  
21 by saying providing supplemental  
22 information; did you not?

23 A. Well, when you asked -- you were  
24 asking me what does my declaration say.  
25 When you asked me specifically about Leeke,

1 I said it was going to an Internet server  
2 and displaying the information that came  
3 back in response to the request to the  
4 server.

5 Q. And you made reference to Leeke's  
6 ability to execute a hyperlink; correct?

7 A. Yes.

8 Q. Now, is it that simple to obtain  
9 information in real time, particularly the  
10 types of information as we talked about  
11 before, such as visual or media information  
12 while the song is playing?

13 A. Well, it's simply a matter of  
14 sending the request and taking the  
15 information that comes back and displaying  
16 it by whatever means. Or presenting it by  
17 whatever means, of which displaying is the  
18 specific example that's discussed in this  
19 section of the Leeke specification we were  
20 reviewing.

21 Q. So in your opinion, retrieving  
22 visual or video information from a remote  
23 source at the same time that you are  
24 playing audio, would have been simply  
25 applying a known technique to known devices

1 at the time of the invention?

2 MR. YAP: Objection.

3 Mischaracterizes.

4 THE WITNESS: I never testified  
5 that it would be video information. It's  
6 displayable information, which could be  
7 text, it could be simple graphics. And  
8 that's exactly what a Web browser does.

9 (BY MR. ENGELLENNER):

10 Q. But some of the examples that you  
11 gave before as to what the supplemental  
12 information was, included video  
13 information; did it not?

14 A. Not with respect to the Leeke  
15 disclosure. That was what we were  
16 discussing, the Julia Child, and the JC  
17 Penney examples, and hyperlink  
18 television.

19 Q. I thought that was one of the  
20 examples in the Qureshey Patent?

21 A. I'm sorry, the Qureshey '652? Or  
22 the Qureshey application?

23 Q. On the '652, the Patent that's in  
24 dispute. So let me go back and ask you  
25 again.

1                   What were the examples of  
2                   supplemental information in the Qureshey  
3                   Patent?

4                   MR. YAP:  Objection.  Asked and  
5                   answered.

6                   THE WITNESS:  These are illustrated  
7                   in the group of figures starting -- the  
8                   group of figures that all start with 20.  
9                   But I believe the one I was using was  
10                  either -- I'm sorry, I was using 21.

11                  But these are all described  
12                  together.  So they're really from 20A all  
13                  the way through 21.  They all seem to be  
14                  displaying text as the supplemental  
15                  information.

16                  (BY MR. ENGELLENER):

17                  Q.  Now, the passage in the Leeke  
18                  Patent that you've referenced regarding  
19                  supplemental information in the function of  
20                  clicking on a hyperlink, isn't that really  
21                  simply opening a another browser window?

22                  A.  Well, all that it's really doing  
23                  is, in the example given here, it is  
24                  sending a request to an HTTP server on the  
25                  Internet having some kind of information

1       come back, which would be text, or could be  
2       graphics, or it could be other things. And  
3       then rendering whatever that is in the  
4       portion of the display shown in the figure  
5       associated with that element.

6                So, for example, and this is not  
7       the only example in the patent but it's the  
8       one we were talking about. In the Leeke  
9       reference it's the section of the screen  
10      labeled 410 or potentially other sections  
11      of the screen as well.

12             Q. That's in which figure?

13             A. Figure 9, the figure we were  
14      discussing in Leeke earlier. This is not  
15      the only place in the patent that the  
16      display of supplementary information  
17      appears. But this is the example I used  
18      earlier to illustration an embodiment of  
19      it.

20             MR. ENGELLENER: Okay. If we  
21      could just take a real brief break. I  
22      think I'm done, but I just want to review  
23      my notes.

24             VIDEOGRAPHER: The time is 3:57 PM.  
25      We are going off the record.

1 (Off the record)

2 (Back on the record)

3 VIDEOGRAPHER: We are back on the  
4 record. The time is 4:06 PM.

5 MR. ENGELLENNER: We're done. Your  
6 witness for redirect. Thank you.

7 MR. FEHRMAN: Thank you very much.

8 CROSS EXAMINATION

9 (BY MR. FEHRMAN):

10 Q. Dr. Bove, I'll ask you just a few  
11 minutes of questions. And so that I think  
12 more that I can kind of keep things  
13 straight as opposed to you, I'll work  
14 backwards from where we left off.

15 So I'll start with some questions  
16 regarding Leeke and your discussions about  
17 real time display. So initially if you  
18 could go to the petition for the '652  
19 Patent, Exhibit 8.

20 And if you'll first look at Page  
21 39.

22 A. Okay.

23 Q. And that paragraph contains a  
24 reference to the claim chart for Claim 11  
25 of Leeke. And that is on Page 21.



1           A. Well, the claim chart referencing  
2     Leeke?

3           Q. The claim chart that is directed to  
4     identification of elements of Leeke.

5           A. Yes.

6           Q. And at the bottom of Page 21 is the  
7     chart portion directed to Claim 11.

8           A. Yes.

9           Q. And at the right of that it  
10    includes a reference to receiving  
11    supplemental information.

12                   MR. ENGELLENER: Objection.  
13    Leading.

14                   (BY MR. FEHRMAN):

15           Q. That chart includes a statement,  
16    "client apparatus 106 allows the user to  
17    request and receive supplemental  
18    information via server 102 about a  
19    currently playing song;" is that correct?

20                   MR. ENGELLENER: Objection.  
21    Leading.

22                   THE WITNESS: Yes.

23                   (BY MR. FEHRMAN):

24           Q. And there is a reference to the  
25    patent after that, or a reference to

1 several portions of the patent. Can you  
2 identify that?

3 A. Yes. There's a reference to Column  
4 14 and a reference to Columns 20 through  
5 21.

6 Q. I believe that in your earlier  
7 conversation you identified Column 14 and  
8 including Lines 31 to 51 that are  
9 identified in this chart?

10 A. Yes.

11 Q. So if you could look at Leeke, at  
12 that section, Column 14 beginning at Line  
13 31.

14 A. I'm sorry. Column 14 beginning at  
15 line 31?

16 Q. Yes.

17 A. Okay.

18 Q. And that first includes a reference  
19 to Figure 9; is that correct?

20 A. Yes.

21 Q. So if you could also look quickly  
22 at Figure 9.

23 A. Okay.

24 Q. And if you can read the first three  
25 sentences of that paragraph? Yes, read it

1 out loud, please.

2 A. "Fig 9 is an example of the second  
3 display region, 222, providing auxiliary  
4 information about a particular station.

5 The auxiliary information is displayed in  
6 response to receiving a user-initiated  
7 selection of the information control 220.

8 The auxiliary information can include a  
9 title of a current song being played by the  
10 station, an artist associated with the  
11 song, an album containing the song, a label  
12 for the song, and a image of the album  
13 cover art."

14 Q. Now, what is your understanding  
15 from the point of view of one of ordinary  
16 skill in the art of the meaning of a  
17 current song being played by the station?

18 A. That is whichever song happens to  
19 be being streamed by the station at that  
20 point in time.

21 Q. So would that be a, what you would  
22 refer to as a real time display of the  
23 title of the song while the song is being  
24 played?

25 A. Well, as I testified earlier, I

1 note that in Figure 9 the center section of  
2 a display is captioned "now playing."

3 Q. Okay. And from the perspective of  
4 point of view of one of ordinary skill in  
5 the art, would it make sense if that title  
6 of a song was displayed sometime after the  
7 song was finished?

8 MR. ENGELLENER: Objection.  
9 Leading.

10 THE WITNESS: Well, the reason for  
11 pressing the more info button is to find  
12 out about the current song. And this  
13 diagram figure illustrates that that is how  
14 the information that's returned is  
15 characterized.

16 (BY MR. FEHRMAN):

17 Q. I see this statement, in the first  
18 line it makes a reference to second display  
19 region 222. And in Figure 9 I don't see  
20 222. So can You turn to Figure 2?

21 A. Okay.

22 Q. So do you see the reference 222 in  
23 Figure 2?

24 A. Yes.

25 Q. And that's referred to as the

1 second display region 222 at Column 14,  
2 Line 31?

3 A. Yes. But what I'll note is that  
4 the region illustrated in Figure 9 is the  
5 lower region of Figure 2. So I take those  
6 to be the same thing, and therefore, I take  
7 the lower portion of Figure 9B, the region  
8 mark 222 in Figure 2.

9 Q. And in Figure 2, is there any  
10 information displayed in the region 222?

11 A. No. It's just called out with a  
12 numerical identifier.

13 Q. Okay. And there is a reference  
14 numeral 220 to info in Figure 2; is that  
15 correct?

16 A. Yes.

17 Q. And going back to Column 14, Line  
18 34 I guess, do you see another reference to  
19 220?

20 A. Yes. I'm sorry, I already read a  
21 reference to 220 into the record.

22 Q. Yes, the same reference.

23 A. The same one, yes.

24 Q. The same reference. So putting  
25 Figure 2 and Figure 9 together with that

1 text, can you explain what happens in  
2 response to selection of information  
3 control 220?

4 MR. ENGELLENER: Objection.  
5 Leading.

6 THE WITNESS: It's my understanding  
7 that a user clicking on what we might call  
8 Tab 220 in Figure 2 would see a display in  
9 region 222 of Figure 2 corresponding to  
10 Figure 9.

11 (BY MR. FEHRMAN):

12 Q. Now, this presentation of auxiliary  
13 information, would one of ordinary skill in  
14 the art consider that to be a desirable  
15 feature?

16 MR. ENGELLENER: Objection.  
17 Leading.

18 THE WITNESS: Well, I believe one  
19 would. And I'll note that one of ordinary  
20 skill in the art reading the specification  
21 of the Leeke Patent would see that the  
22 inventors of the Leeke Patent give a  
23 variety of reasons why it might be  
24 desirable as well.

25 (BY MR. FEHRMAN):

1           Q. So in your opinion from the point  
2 of view of one of ordinary skill in the  
3 art, would one of skill in the art have  
4 been motivated to provide that feature as  
5 disclosed in Leeke in combination with the  
6 system of Berman and Qureshey as previously  
7 combined?

8           A. Yes.

9           Q. And can you provide a little bit  
10 more explanation as to why such motivation  
11 would exist?

12           A. Well, as I testified previously,  
13 this feature is able to be implemented  
14 given hardware and software that already  
15 exists in the combination of the other two  
16 references. They already have an  
17 appropriate display. They already have the  
18 ability to connect to a server on the  
19 network.

20                   So provision of this feature just  
21 requires having a server on the network to  
22 provide the appreciate information as well  
23 as perhaps adding buttons to the display on  
24 the screen in order to call this up.

25                   So the first issue is that there is

1 not a significant amount of work involved  
2 in adding this feature. But as I opined  
3 earlier, there are a variety of reasons why  
4 a user of such a system would find this --  
5 find the addition of this supplementary  
6 info to be advantageous or desirable as a  
7 feature.

8 Q. Okay. Let's move to the  
9 combination of Qureshey and Berman. You  
10 had opined that it would have been obvious  
11 to one skilled in the art to combine those  
12 features and provide both the Internet  
13 radio feature of Qureshey and the shorthand  
14 terminology "audio on demand" feature of  
15 Berman; is that correct?

16 MR. ENGELLENNER: Objection.  
17 Leading.

18 THE WITNESS: That is an opinion  
19 that I provide in my '652 declaration.

20 (BY MR. FEHRMAN):

21 Q. Okay. Stepping back to not network  
22 appliances or devices but more of a  
23 conventional stereo system or conventional  
24 radio. A radio will have the ability to  
25 tune radio stations?



1 A. Yes.

2 Q. And that is one source of music or  
3 information to allow the listener to listen  
4 to?

5 A. Yes.

6 Q. Now, you're familiar that lots of  
7 radios have another input to allow  
8 connection of another source, such as CD  
9 player, or a phone or something like  
10 that --

11 MR. ENGELLENNER: Objection.  
12 Leading.

13 MR. FEHRMAN: -- is that correct?

14 THE WITNESS: It's my understanding  
15 that many radios provide other audio inputs  
16 in addition to radio broadcast, yes.

17 (BY MR. FEHRMAN):

18 Q. So is it your opinion that in an  
19 audio device that a user is listening to,  
20 that as a general matter it's desirable to  
21 provide more than one audio source?

22 MR. ENGELLENNER: Objection.  
23 Leading.

24 THE WITNESS: Well, certainly by  
25 analogy with the example you gave before, I

1 would think that an Internet radio device  
2 would be seen as more desirable by a  
3 potential user if he also had other audio  
4 sources on it.

5 (BY MR. FEHRMAN):

6 Q. Can you look at Figure 1 of the  
7 Qureshey application, PCT application.

8 A. Yes. And I note that Figure 1 of  
9 the Qureshey application appears to be  
10 identical to Figure 1 of the '652 Patent.

11 Q. Okay. And can you identify the  
12 portion of the figure with the reference  
13 number 120? Do you see on the right  
14 there's a line of buttons?

15 A. Yes. And in -- on Page 5, Line 10  
16 of the Qureshey application we're told that  
17 it is a button bar 120.

18 And then we are told on the  
19 following line that it selects audio  
20 sources including AM radio, FM radio, Web  
21 radio, cassette, and external input. It  
22 says "including, for example." So it's  
23 limited to those.

24 Q. It's identifying five different  
25 sources that can be selected?

1           A. Yes.

2           Q. Now, from the point of view of one  
3 of ordinary skill in the art, can you  
4 provide a reason or do you believe there is  
5 a reason or motivation that one of ordinary  
6 skill in the art might -- would consider  
7 combining or it would be obvious to such a  
8 person to combine the audio on demand  
9 operation of Berman with this system of  
10 Qureshey?

11           A. Well, to the extent that what  
12 you're asking is could another button be  
13 added to button bar 120, which is audio on  
14 demand, that would certainly be an obvious  
15 extension of this button bar just to  
16 include another source.

17           Q. Okay. And would it have been  
18 anything difficult for one of ordinary  
19 skill in the art to consider adding that  
20 additional source?

21           A. Well, as I've opined earlier, the  
22 network interface used for the web radio  
23 broadcast that is already part of that  
24 button bar, one of the selectable sources  
25 on that button bar, would also provide the

1 data for the on-demand Internet audio.

2 Q. Why don't we move now to White,  
3 Exhibits 15. So we have some you or you  
4 have some discussion regarding White that  
5 also, if I can characterize, related to  
6 whether it had a real time operation  
7 regarding playing playlist songs from a  
8 playlist?

9 MR. ENGELLENER: Objection.

10 Leading.

11 (BY MR. FEHRMAN):

12 Q. And if I recall, you discussed  
13 Column 16, I believe from Lines 20 to 34,  
14 but at least the last sentence referring to  
15 a husband may want to send a romantic  
16 playlist to his wife on their  
17 anniversary?

18 A. Yes, I recall citing that  
19 language.

20 Q. Okay. And do you believe that that  
21 would be viewed by one of ordinary skill in  
22 the art as an indication that a playlist  
23 would be sent as opposed to just the audio  
24 information?

25 A. Well, as I testified --

1 MR. ENGELLENER: Objection.

2 Leading.

3 THE WITNESS: As I testified  
4 earlier, the plain language of this says  
5 "send a playlist." It does not say "send  
6 the songs corresponding to a playlist."

7 (BY MR. FEHRMAN):

8 Q. Okay. And the first sentences of  
9 that paragraph refers to step 804 of Figure  
10 8.

11 A. Yes.

12 Q. And if you could make a quick  
13 reference to 804 and state what that box  
14 says?

15 A. 804 appears in Figure 8. And the  
16 box in Figure 8 labeled 804 says, "user  
17 prompted for destination device."

18 The language describing that step,  
19 starting at Line 20 of Column 16, says,  
20 "upon obtaining the data associated with  
21 the customized playlist, the method may  
22 proceed to step 804 where the user is  
23 prompted for a destination for the  
24 playlist."

25 Q. Okay. And if you can turn to

1 Column 17, there's some additional  
2 discussion regarding step 804 beginning at  
3 Line 32. If could you read that paragraph  
4 and the paragraph following it to yourself  
5 first?

6 A. Okay.

7 Q. So in the middle Line 37, there's a  
8 sentence beginning with "the user." Can  
9 you read that?

10 A. "The user may receive the selected  
11 playlist at the determined device for  
12 eventual playing."

13 Q. Can you provide your understanding  
14 of the overall disclosure of these two  
15 paragraphs to one of skill in the art?

16 MR. ENGELLENER: Objection. The  
17 document speaks for itself.

18 THE WITNESS: Well, this gives a  
19 description of several related issues. One  
20 of the issues is the ability to select one  
21 or a plurality of devices out of a  
22 plurality of devices, perhaps a larger  
23 plurality, as being the destination or  
24 destinations for receiving the audio  
25 information.

1                   And then it gives some examples.

2                   And it also describes how the different  
3                   devices may require different formats of  
4                   the information so we can format it. It  
5                   also, of course, says in plain language  
6                   "the user may receive the selected playlist  
7                   at the determined device."

8                   And the fact that it says "for  
9                   eventual playing" suggests that this  
10                  doesn't mean that necessarily the music  
11                  starts playing immediately upon receipt,  
12                  but rather, the playlist must be stored in  
13                  the device.

14                  (BY MR. FEHRMAN):

15                  Q. And in the situation where the user  
16                  downloads to more than one destination  
17                  device, do you believe that that means that  
18                  one of ordinary skill in the art would  
19                  consider that it's played in real time at  
20                  all of those devices?

21                  MR. ENGELLENNER: Objection.  
22                  Beyond the scope of cross-examination.

23                  THE WITNESS: Well, what it --  
24                  since it says -- it's saying this in the  
25                  context of eventual playing. That would

1 suggest that it need not be played at the  
2 same time on each of the plurality of  
3 devices.

4 (BY MR. FEHRMAN):

5 Q. And can you also look at the  
6 sentence beginning at Line 52 and read that  
7 out?

8 A. "Moreover, the download may occur  
9 in an off-line environment allowing a user  
10 to enjoy the selected audio information  
11 access online without having to be online  
12 or utilizing a browsing environment."

13 Q. So based upon a discussion in  
14 Columns 16 and 17 regarding step 804 and  
15 Figure 8, what is your conclusion regarding  
16 whether or not the transfer of audio  
17 information includes playlists and is done  
18 necessarily in real time?

19 MR. ENGELLENER: Objection.  
20 Leading. Scope.

21 THE WITNESS: Well, with respect to  
22 the first part, as I've recently testified,  
23 the plain language of this paragraph says,  
24 the paragraph starting at Line 32, says  
25 that the playlist is received at the



1 determined device.

2 Second, with respect to the issue  
3 of real timeness, given that it says it's  
4 for eventual playing, given that it can be  
5 received at multiple devices for eventual  
6 playing, and further, given that it says  
7 user may enjoy the selected audio  
8 information without having to be online;  
9 all of that would suggest that the  
10 information must be stored in the device,  
11 not just streamed.

12 (BY MR. FEHRMAN):

13 Q. Okay. Let's move back to your  
14 earlier discussion regarding playlist that  
15 you have this morning. If you can  
16 reference to the '952 Patent and the  
17 decision on the petition.

18 A. Okay.

19 Q. So there was a lot of discussion  
20 regarding playlists from depositions --  
21 your deposition of yesterday; is that  
22 correct?

23 A. Yes.

24 Q. And that deposition concerned two  
25 other patents that are involved in IPRs?

1 A. Yes.

2 Q. And those two patents are, just as  
3 titles, of '099 and the '873 Patents?

4 A. Yes.

5 Q. To your knowledge, are those  
6 related to or part of a family with the  
7 '652 and '952 Patents?

8 A. I don't believe they are.

9 Q. So there was this discussion  
10 regarding things said yesterday that were  
11 said in discussing two different patents  
12 than your deposition relates to today?

13 MR. ENGELLENER: Objection.  
14 Leading.

15 THE WITNESS: Yes, I recall that.

16 (BY MR. FEHRMAN):

17 Q. Is it your understanding that in an  
18 IPR proceeding, a claim is to be given the  
19 broadest reasonable construction consistent  
20 with a specification?

21 A. I have been so informed and I also  
22 note that in my declaration.

23 Q. And just to be clear as to the  
24 specification, is it the specification of  
25 that patent?

1 A. Yes.

2 Q. So what's important is to look at  
3 these patents to understand the meaning of  
4 "playlist"?

5 A. Yes.

6 Q. And the Board did that. So if you  
7 can turn to Page 12 of the institution  
8 decision for the '952 Patent. Looking at  
9 the paragraph beginning at the bottom.

10 MR. ENGELLENER: Objection.  
11 Leading.

12 (BY MR. FEHRMAN):

13 Q. If you could read that paragraph?

14 A. And just to be clear, this is the  
15 paragraph that continues to about a third  
16 of the way down on 13?

17 Q. Yes. So the first sentence is that  
18 "the specification of the 952 Patent  
19 defines."

20 A. Yes, I have that.

21 Q. Okay. Defines, quote, "Playlist  
22 1528" as a list of audio files and  
23 associated URLs of where the audio files  
24 were retrieved from. And it references  
25 Column 21, Line 63 to 65. Can you look at

1 those?

2 A. Yes.

3 Q. So does that section provide an  
4 indication of the meaning of "playlist" to  
5 you, to one of ordinary skill in the art?

6 MR. ENGELLENER: Objection.  
7 Leading.

8 THE WITNESS: As I believe I've  
9 testified this morning, I read that as a  
10 definition of "playlist" in the spec.

11 (BY MR. FEHRMAN):

12 Q. Okay. Therefore, do you agree with  
13 the conclusion made by the Board that the  
14 last sentence of the paragraph regarding  
15 the proper construction of "playlist" for  
16 the '652 and '952 Patents?

17 MR. ENGELLENER: Objection.  
18 Leading.

19 THE WITNESS: Well, what I see is  
20 that the Board has construed "playlist" to  
21 be exactly the language that we just  
22 referred to in Column 21.

23 (BY MR. FEHRMAN):

24 Q. So you're referring to the  
25 statement "we construed 'playlist' to

1 mean"?

2 A. "To mean," yes.

3 Q. And can you read that?

4 A. "We construe 'playlist' to mean a  
5 list of audio files or URLs of where the  
6 audio files were retrieved from."

7 And the only difference I see  
8 between the language in the decision and  
9 the language in the patent spec is that the  
10 patent spec has an apostrophe after "URL"  
11 and the decision doesn't. But they're  
12 otherwise identical.

13 MR. FEHRMAN: I think we're about  
14 out of -- why don't we break so you can  
15 change the tape.

16 VIDEOGRAPHER: The time is 4:36 PM.  
17 We are going off the record. This will be  
18 the end of disk 3 in the deposition of V.  
19 Michael Bove, Jr.

20 (Off the record)

21 (Back on the record)

22 VIDEOGRAPHER: This is disk number  
23 4 in the deposition of V. Michael Bove,  
24 Junior. We are back on the record. The  
25 time is 4:43 PM.

1 (BY MR. FEHRMAN):

2 Q. So, Dr. Bove, continuing with the  
3 institution decision by the Board. There  
4 was a lot of discussion regarding claim  
5 construction issues, that it was indicated  
6 that the Board disagreed with your opinion.

7 Now, one of those was the issue of  
8 whether a playlist is directed to rather  
9 than transferred to a device. And that's  
10 referred to in the first full paragraph at  
11 Page 13.

12 Now, after that, though, there's an  
13 issue regarding the overall construction of  
14 the term "playlist" assigned to the  
15 electronic device.

16 And if you look at the last  
17 paragraph starting on Page 13, the first  
18 sentence states, "Finally, the parties  
19 dispute whether a user is required to  
20 select the device."

21 Could you refer to your declaration  
22 at Paragraphs 13 and 14 and indicate the,  
23 or generally summarize, the position that  
24 you took regarding this issue of claim  
25 construction of "playlist assigned to the

1 electronic device"?

2 A. The opinion --

3 MR. ENGELLENER: Objection.

4 Leading.

5 THE WITNESS: The opinion that I  
6 give in my declaration with respect to  
7 "playlist assigned to the electronic  
8 device" can be summarized by saying that  
9 the destination device is selected by the  
10 user.

11 (BY MR. FEHRMAN):

12 Q. So is that reflected in your  
13 statement in each of these places, the  
14 assignment is initiated by the user and is  
15 made to a specific user-selected device?

16 MR. ENGELLENER: Objection.

17 Leading.

18 THE WITNESS: This is in Paragraph  
19 14. Yes, I'm saying and I cite a number of  
20 places in the '952 Patent where the  
21 assignment of playlist to devices --  
22 playlists to devices is described.

23 And I say in each of these places  
24 the assignment is initiated by the user and  
25 the user has selected the device that will

1 be the destination of the assignment.

2 (BY MR. FEHRMAN):

3 Q. Okay. Can you read to us the  
4 conclusion of the Board in the last  
5 sentence of the paragraph which ends on  
6 Page 14?

7 A. "Therefore, on the record currently  
8 before us we construe 'playlist assigned to  
9 the electronic device' to mean a list of  
10 audio files or URLs of where the audio  
11 files were retrieved from, directed to a  
12 particular device selected by a user."

13 MR. FEHRMAN: I have no further  
14 questions.

15 MR. ENGELLENER: I have a very  
16 short re-cross.

17 RE-DIRECT EXAMINATION

18 (BY MR. ENGELLENER):

19 Q. Dr. Bove, a few moments ago you  
20 were referred to Column 21, Lines 62  
21 through 65 of the '952 Patent for a  
22 discussion of "playlist;" do you recall  
23 that?

24 A. Yes.

25 Q. Now, that passage there refers to a



1 particular playlist; does it not?

2 A. Well, this is describing a playlist  
3 1528.

4 Q. And so that would be one  
5 embodiment; is that correct?

6 A. This is an embodiment illustrated  
7 in Figure 15. And we learn that at Line 40  
8 of Column 21.

9 And what I take away from the  
10 introduction of this section is it says  
11 "Figure 15 illustrate a configuration for  
12 assigning playlists and audio sources to a  
13 network-enabled audio device 1510, or other  
14 devices such as a PC 1508 from a  
15 network-enabled audio device 1520, or  
16 another device."

17 So I take this to be the scenario  
18 that we have been discussing with respect  
19 to these claims.

20 Q. Now, secondly, the -- you were  
21 asked a few moments ago to compare what  
22 this passage says and what the institution  
23 decision says. And I believe you said they  
24 are identical except for an apostrophe.

25 I just want to ask you to correct

1 the record. I do believe that in the  
2 patent there is a "and," A-N-D, between the  
3 words "audio files" and "associated URLs."  
4 And in the institution decision the word  
5 "or" is used instead; is that correct?

6 A. Just a moment. This is on Page?

7 Q. I believe it's on 14.

8 A. Yes. I will correct the record to  
9 say that that says "a list of audio files  
10 or URLs where the audio files were  
11 retrieved from." And in the specification  
12 here it says, "a list of audio files and  
13 associated URLs." So the word "associated"  
14 also doesn't appear.

15 Q. And do you have any opinion on the  
16 difference between those two phrases as  
17 you've just quoted them?

18 A. I think the difference is that that  
19 suggests that the audio files do not have  
20 to be accessible by URLs but potentially  
21 could be accessible by some other means.

22 In the construction in the decision  
23 where in the '952 specification it's saying  
24 that the list of audio files has a URL  
25 associated with each one.

1 Q. And that's, again, in connection  
2 with the particular embodiment described in  
3 the playlist that's identified as 1528?

4 A. Right. The -- well, it's not --  
5 it's described as a configuration for  
6 assigning playlists, as I noted before.

7 Q. I'm sorry, I didn't follow that.

8 A. Oh. I said that the playlist 1528  
9 occurs in a particular context, which is  
10 recited starting at Line 40 of that column.  
11 So it's not some arbitrary embodiment; it's  
12 a specific embodiment of a specific feature  
13 of the claimed invention.

14 MR. ENGELLENER: I think I'm done.

15 VIDEOGRAPHER: The time is 4:52 PM.  
16 We are going off the record. This is the  
17 end of disk 4, and the end of the  
18 deposition of V. Michael Bove, Jr.

19 (End time: 4:52 PM)

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DEPOSITION ERRATA SHEET

Assignment No.: 1207-92968

Case Caption: YAMAHA VS. BLACK HILLS MEDIA

DECLARATION UNDER PENALTY OF PERJURY

I declare under penalty of perjury  
that I have read the entire transcript of  
my Deposition taken in the captioned matter  
or the same has been read to me, and the  
same is true and accurate, save and except  
for changes and/or corrections, if any, as  
indicated by me on the DEPOSITION ERRATA  
SHEET hereof, with the understanding that I  
offer these changes as if still under oath.

Signed on the        day of        ,  
2014.

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V. MICHAEL BOVE, JR.

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DEPOSITION ERRATA SHEET

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REPORTER'S CERTIFICATE

I, DENISE D. HARPER-FORDE, CSR No. 000133, Certified Shorthand Reporter, Certify that the foregoing proceedings were taken before me at the time and place therein set forth, at which time the witness was put under oath by me.

That the testimony of the witness, the questions propounded, and all objections and statements made at the time of the examination were recorded stenographically by me and were thereafter transcribed.

That the foregoing is a true and correct transcript of my shorthand notes so taken.

I further certify that I am not a relative or employee of any Attorney of the parties, nor financially interested in the action.

I declare under penalty of perjury under the laws of Massachusetts that the foregoing is true and correct.

Dated this 3rd day of June, 2014

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DENISE D. HARPER-FORDE, CSR NO. 000133

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# **EXHIBIT 1**

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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YAMAHA CORPORATION OF AMERICA  
Petitioner

v.

BLACK HILLS MEDIA, LLC  
Patent Owner

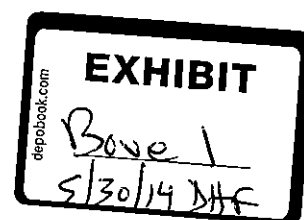
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Case IPR2013-00593  
Patent 8,045,952 B2

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**NOTICE OF DEPOSITION OF  
V. MICHAEL BOVE, JR.**

***Mail Stop "PATENT BOARD"***  
Patent Trial and Appeal Board  
U.S. Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450



*NOTICE OF DEPOSITION OF V. MICHAEL BOVE, JR.*

In accordance with 37 C.F.R. § 42.53, Patent Owner Black Hills Media, LLC provides notice to Petitioner Yamaha Corporation of America that the deposition of V. Michael Bove, Jr. will be held Friday, May 30, 2014, commencing at 9:00am in the offices of Pepper Hamilton LLP, 125 High Street, 19<sup>th</sup> Floor – High Street Tower, Boston, MA 02110-2736. The deposition will be recorded by stenographic and audiovisual (videotape) means before an officer duly authorized by law to administer oaths under 35 U.S.C. § 23.

Pursuant to 37 C.F.R. § 42.53(d)(1), the parties have conferred and have agreed on this date and location for the deposition.

Respectfully submitted,

/Thomas Engellenner/

Thomas Engellenner (Reg. No. 28,711)  
Lead Attorney for Patent Owner Black Hills  
Media, LLC

Date: April 25, 2014  
PEPPER HAMILTON LLP  
125 High Street  
19<sup>th</sup> Floor – High Street Tower  
Boston, MA 02110-2736  
(617) 204-5100

**CERTIFICATE OF SERVICE**

The undersigned hereby certifies that the above-captioned "Notice of Deposition of V. Michael Bove, Jr." was served in its entirety on April 25, 2014, via email upon the following counsel of record for the Patent Owner:

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Respectfully submitted,

/Thomas Engellenner/

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(617) 204-5100

# **EXHIBIT 2**

Patent No. 8,045,952  
Petition For *Inter Partes* Review

**UNITED STATES PATENT AND TRADEMARK OFFICE**  
\_\_\_\_\_  
**BEFORE THE PATENT TRIAL AND APPEAL BOARD**  
\_\_\_\_\_

Yamaha Corporation of America  
Petitioner

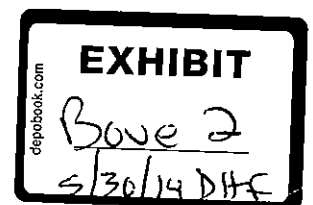
v.

Black Hills Media, LLC  
Patent Owner

Patent No. 8,045,952  
Issue Date: October 25, 2011  
Title: METHOD AND DEVICE FOR  
OBTAINING PLAYLIST CONTENT OVER A NETWORK

\_\_\_\_\_  
*Inter Partes* Review No. \_\_\_\_\_

**DECLARATION OF V. MICHAEL BOVE, JR.**



I, V. Michael Bove, Jr., make this declaration in connection with the proceeding identified above.

## **I. INTRODUCTION**

1. I have been retained by counsel for Yamaha Corporation of America (“Yamaha”) as a technical expert in connection with the proceeding identified above. I submit this declaration in support of Yamaha’s Petition for *Inter Partes* Review of United States Patent No. 8,045,952 (“the '952 patent”).

2. I am being paid at an hourly rate for my work on this matter. I have no personal or financial stake or interest in the outcome of the present proceeding.

## **II. QUALIFICATIONS**

3. I am employed as a Principal Research Scientist at the Massachusetts Institute of Technology, where I am also currently head of the Object-Based Media group at the Media Laboratory, co-director of the Center for Future Storytelling, and co-director of the consumer electronics working group CE2.0. I was also co-founder of and technical advisor to WatchPoint Media, Inc., an interactive television products and services company with offices in Lexington, Massachusetts and London, England, which is now part of Ericsson. I currently serve as technical advisor to One Laptop Per Child, creators of an inexpensive laptop computer for children in developing nations.



4. I hold an S.B. in Electrical Engineering, an S.M. in Visual Studies, and a Ph.D. in Media Technology, all from the Massachusetts Institute of Technology. I have authored over ninety journal and conference papers on distributed media, interactive media, and digital media. I have supervised over fifty graduate theses, and since 1990 have taught a graduate subject at MIT called Signals, Systems, and Information for Media Technology. I am a Fellow of the Society of Photo-Instrumentation Engineers, a member of the Board of Editors of the Journal of the Society of Motion Picture and Television Engineers, and a member of a number of other professional organizations including the Optical Society of America, the Association for Computing Machinery, and the Institute of Electrical and Electronic Engineers. I am a named inventor on seventeen U.S. patents. I served as General Chair of the 1996 ACM Multimedia Conference and of the 2006 IEEE Consumer Communications and Networking Conference (CCNC'06). Attached as Appendix A is a copy of my curriculum vitae.

### **III. MATERIALS CONSIDERED**

5. In preparing this declaration, I have reviewed, among other things, the following materials: (a) the '952 patent and its prosecution history; (b) U.S. Patent No. 6,502,194 ("Berman"); (c) U.S. Patent No. 6,587,127 ("Leeke"); (d) U.S. Patent No. 7,472,353 ("Wolff"); (e) reference material relating to the

Lansonic DAS-750 (“Lansonic”); and (f) the Petition for *Inter Partes* Review of the '952 patent to which my declaration relates.

#### **IV. DEFINITIONS AND STANDARDS**

6. I have been informed and understand that claims are construed from the perspective of one of ordinary skill in the art at the time of the claimed invention, and that during *inter partes* review, claims are to be given their broadest reasonable construction consistent with the specification.

7. I have also been informed and understand that the subject matter of a patent claim is obvious if the differences between the subject matter of the claim 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 to which the subject matter pertains. I have also been informed that the framework for determining obviousness involves considering the following factors: (i) the scope and content of the prior art; (ii) the differences between the prior art and the claimed subject matter; (iii) the level of ordinary skill in the art; and (iv) any objective evidence of non-obviousness. I understand that the claimed subject matter would have been obvious to one of ordinary skill in the art if, for example, it results from the combination of known elements according to known methods to yield predictable results, the simple substitution of one known element for another to obtain predictable results, use of a known technique to improve

similar devices in the same way or applying a known technique to a known device ready for improvement to yield predictable results. I have also been informed that the analysis of obviousness may include recourse to logic, judgment and common sense available to the person of ordinary skill in the art that does not necessarily require explication in any reference.

8. In my opinion, a person of ordinary skill in the art pertaining to the '952 patent would have at least a bachelor's degree in computer science or electrical engineering, and at least one year of practical experience with networked multimedia.

9. I have been informed that the relevant date for considering the patentability of the claims of the '952 patent is November of 2000. Based on my education and experience in the fields of networked digital media and consumer electronics, I believe I am qualified to provide opinions about how one of ordinary skill in the art in 2000 would have interpreted and understood the '952 patent and the prior art discussed below.

## **V. THE '952 PATENT**

10. The claims of the '952 patent are directed to a system and method for a networked electronic device with local storage for music to receive a playlist of songs, to receive information enabling the device to obtain the songs from one or more remote sources on the network, and then to obtain the songs.

## VI. CLAIM CONSTRUCTION

11. I have been asked to provide my opinion on two claim terms: “playlist assigned to the electronic device” and “wherein ones of the plurality of songs are not stored on the electronic device,” by discussing what one of ordinary skill in the art at the time of the patent filing would regard as their broadest reasonable interpretation consistent with the specification. In each case my opinion agrees with the position taken in Yamaha’s Petition for *Inter Partes* Review.

### A. “playlist assigned to the electronic device”

12. The term “playlist assigned to the electronic device” appears in independent claim 9, while a related term “assigning a playlist to an electronic device” appears in independent claim 1, and “assign a playlist to one of the plurality of electronic devices,” appears in independent claim 15. The discussion to follow applies to all three of these related phrases.

13. My opinion is that one of ordinary skill in the art would understand “playlist assigned to the electronic device” to be a list of songs that is to be transferred to a particular device selected by the user.

14. First, the normal grammatical reading of “assigned to” in my opinion refers to a designation of something to a particular entity, such as for example assignment of a project to a particular person. This normal understanding

is consistent with the written description contained in the '952 patent. Discussion of the assignment of playlists to devices occurs in a number of places, including, but not limited to, 4:50-5:3, 21:40-23:5, 24:44-60, and 28:11-30:26. The process is also illustrated in FIG. 17C (specifically, elements 1761 and 1762), and FIGS. 19B and 19C1 (element 1906). In each of these places, the assignment is initiated by the user, and is made to a specific user-selected device. It is notable that the menu selection in FIG. 17C and discussed in 24:50-53 is “Make Available On,” designating a particular device to which the playlist will become available, rather than simply “Make Available,” “Export,” or some equivalent non-directed language.

**B. “wherein ones of the plurality of songs are not stored on the electronic device”**

15. Independent claim 9 contains the term “wherein ones of the plurality of songs are not stored on the electronic device.”

16. It is my opinion that this claim limitation simply describes a situation in which the storage in the electronic device does not already contain all the songs in the playlist at the time that the playlist is received. It implies by its language that the device contains memory that can store songs and excludes a situation in which the device does not contain local storage for songs. Otherwise, the statement that ones of the songs are not stored on the device becomes a

tautology. If the device has no memory for storing songs it is of course a fact that not only “ones,” but rather *all* songs in every instance will not be stored on the device. In my opinion such reading does not make sense, when considered in connection with the '952 patent specification.

17. While the “Summary of the Invention” section beginning at 3:57 briefly describes two possible implementations that do not contain enough song storage to hold all the songs on the playlist, in my opinion these are not relevant to any assignment of a playlist to a device, as recited in claim 9. More specifically, one implementation is storage-less: “the network-enabled audio device comprises speakers, an AC power line, and a network line,” (3:61-62) which one of ordinary skill in the art would understand as a networked remote output for another music player, not itself a device to which a playlist could be assigned. The other implementation in that discussion (two sentences beginning at 4:4-9) has a limited amount of memory: “In one embodiment, the network-enabled audio device does not have any storage space other than memory. This embodiment provides for a low-cost system that can play songs from playlists stored on the IPAN Manager or on the PC's storage space without having to store the audio files locally.” I understand this implementation to be a variation of the previous one with the addition of a small amount of buffer memory; again, the playlist is not “assigned” to the device but instead resides on another device which simply uses this device

for output. Therefore, I believe that these isolated statements have nothing to do with assigning playlists.

18. In contrast, other parts of the '952 patent specification include extensive discussion of assignment of playlists and, in those discussions, the devices to which playlists are assigned need to have enough memory to store the playlists and songs. Discussion in the specification of assigning playlists to “network-enabled audio devices” (21:40-22:15) describes devices to which playlists can be assigned as, “[e]ach network-enabled audio device 1510 has a storage space 1512 for network-enabled audio device IPAN software 1526, a playlist 1528, and associated URL’s and songs within the playlist. Similarly, each network-enabled audio device 1520 has a storage space 1522 for network-enabled audio device IPAN software 1526, a playlist 1528, and associated URL’s and songs within the playlist.” The detailed discussion at 22:36-58, 24:44-25:2 and 28:11-30:26 is similar. Thus devices to which playlists are assigned need to have enough memory to store the playlists and songs.

## **VII. ANALYSIS OF PRIOR ART**

### **A. Berman**

19. I have been asked as to my opinion as to whether claim 13 of the '952 patent would have been obvious to one of ordinary skill in the art in view of Berman. First, it is my opinion that all of the elements of independent claim 9 are

disclosed in Berman as set forth in the claim chart contained in the '952 petition and that Berman anticipates claim 9. Claim 13 depends from claim 9 and requires that “the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained.” It would have been well known to one of ordinary skill in the art in 2000 that music files could be provided by a Web server. As one example, the MP3.com music server site launched in 1997. Moreover, it was (and is) common that a song could have been obtained more than once from a Web server. Therefore, one of ordinary skill in the art would conclude that claim 13 would have been obvious in light of the Berman reference.

**B. Leeke**

20. I have been asked as to my opinion as to whether claims 9, 10, 13, and 14 of the '952 patent would have been obvious to one of ordinary skill in the art in light of the Leeke reference, if the claim term “playlist assigned to the electronic device” is construed as requiring user selection of a specific device (as discussed in Section VI above). Initially, it is my opinion that each of the elements of these claims are disclosed in Leeke as set forth in the claim chart contained in the '952 petition under a broad construction of this term and the claims are anticipated under such construction. Under the narrower construction, it is my opinion that the claims would have been obvious in view of Leeke.



21. In conjunction with this issue, I note that the Leeke reference states at 20:35-42 that playlists can be transferred between users and to plural access points of one user. In my opinion, in view of this disclosure it would have been obvious that a playlist can be assigned to a device by making a selection of a specific device. This is especially so in view of the disclosure of virtual smart cards and the statement that playlists can reside on the storage device of the server as indicated at 17:23-33.

**C. Wolff**

22. I have been asked as to my opinion as to whether claims 9, 10, and 14 of the '952 patent would have been obvious to one of ordinary skill in the art in light of the Wolff reference, if the claim term “playlist assigned to the electronic device” is construed as requiring user selection of a specific “network access appliance” (NAA) (as discussed in Section VI above). Initially, it is my opinion that each of the elements of these claims are disclosed in Wolff as set forth in the claim chart contained in the '952 petition under a broad construction of this term, and the claims are anticipated under such construction. Under the narrower construction, it is my opinion that the claims would have been obvious in view of Wolff.

23. The Wolff reference discloses that a user may have multiple NAAs (*e.g.* FIG. 1), and it also discloses that a media object (including a song) can have

some sort of identifier associated with it that indicates whether it is appropriate for a particular NAA (4:5-11). It is my opinion that it would have been obvious that a user might desire different music playlists to be available to different music players, and thus it would have been obvious to select a particular NAA for receipt of a particular playlist.

24. I have additionally been asked as to my opinion as to whether claim 13 of the '952 patent would have been obvious in light of the Wolff reference. Claim 13 depends from claim 9 and requires that “the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained.” The Wolff reference discusses obtaining multimedia content on the Internet from Web servers (1:21-44) and discloses that the NAAs can use the Internet to retrieve media objects (3:56-58). It was (and is) common that a song could have been obtained more than once from a Web server, and therefore one of ordinary skill in the art would conclude that it would have been obvious in light of the Wolff reference that the personalized server could be a Web server.

**D. Lansonix**

25. I have been asked as to my opinion on whether claims 9, 10, and 14 of the '952 patent would have been obvious to one of ordinary skill in the art in view of Lansonix if each Web page constitutes a single reference. As a

preliminary matter, it is my opinion that all of the elements of the claims are disclosed in the Web pages as set forth in the claim charts in the '952 petition. If the multiple Web pages making up the Lansononic disclosure do not constitute a single reference, it is my opinion that one of ordinary skill in the art would have immediately understood that all the pages were describing features of a single device, and would have found it obvious to consider the multiple disclosed features as part of a single device that would render claims 9, 10, and 14 obvious.

26. I note that claim 9 recites “receiving, at the electronic device, information enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source.” I have been asked as to my opinion as to Lansononic on whether, when playing songs stored on a remote device by selecting a playlist, the selected playlist contains information enabling the device to obtain the songs from the remote source. It is my opinion that in order for the device to play songs on a playlist that are stored on a remote device, the playlist necessarily has information enabling the device to obtain the songs from the remote source. If such information were not there, the device would not be able to obtain the remotely stored songs. Therefore, one of ordinary skill in the art would have recognized that such information would be present in Lansononic.

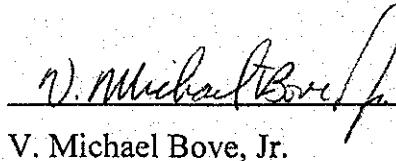
27. I additionally have been asked to provide my opinion on whether claim 13 would have been obvious in view of Lansononic. Claim 13 requires that

“the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained.” The Lansonnic reference discloses that the DAS-750 device can obtain songs from Web sites: “[t]hrough an array of popular web sites, users can enjoy thousands of songs which can be legally downloaded and then played in virtually any DAS equipped room or office.” Since it is quite normal that a song could have been obtained more than once from a Web server, for example in order to replace one that had been inadvertently deleted, one of ordinary skill in the art would have found claim 13 obvious in light of the Lansonnic reference.

\* \* \*

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and that 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: September 18, 2013

  
V. Michael Bove, Jr.

Last updated June 2013

Massachusetts Institute of Technology  
School of Architecture and Planning Personnel Record  
Victor Michael Bove, Jr.  
Media Arts and Sciences Program

*Date of Birth*  
23 December 1960

*Citizenship*  
United States of America

*Education*  
M.I.T., S.B. Electrical Engineering, June 1983  
M.I.T, S.M. Visual Studies, September 1985  
M.I.T., Ph.D. Media Technology, June 1989

*Title of Thesis for Most Advanced Degree*  
V. M. Bove, Jr., *Synthetic Movies Derived from Multi-Dimensional Image Sensors*, Ph.D. thesis, M.I.T., June 1989.

*Principal Fields of Interest*  
Applications of machine analysis to media-related applications (adding intelligence to live interpersonal communications and authored content), advanced user interfaces for consumer electronics, novel imaging hardware (in particular holographic television)

*Non-M.I.T. Experience*  
R.C.A. Microcomputer Products Division, Summer Student Employee, May 1980-Aug. 1980  
Co-Founder and Technical Advisor, WatchPoint Media, Inc., 1999-2003

*History of M.I.T. Appointments*  
Technical Assistant, May 1983-Sept. 1983  
Graduate Research Assistant, Sept. 1983-April 1989  
Postdoctoral Research Associate, April 1989-July 1989  
Assistant Professor of Media Technology, July 1989-July 1993  
Associate Professor of Media Technology, July 1993-July 1997

Principal Research Scientist, MIT Media Laboratory, July 1997-present

*Consulting Record*

Aware, Inc., July-Sept. 1991

Bell Northern Research, August 1991, August-Sept. 1995

Plaza Investment Managers, Inc., July-August 1992

World Book Publishing (encyclopedia revisions), March 1993

Van Nostrand Reinhold (book manuscript reviewing), April 1994-present

Analog Devices, Inc., July-August 1994

Blackside Productions, Inc. (consultant for the TV series "Breakthrough: People of Color in American Science"), October-December 1994

Axiom Venture Partners, Nov. 1995-March 1996

Data Translation Inc./Kenyon and Kenyon (consultant on patent case), March 1996

Naval Undersea Warfare Center, June 1996

Copyright Clearance Center, Inc., Sept. 1996-Sept. 1997

Artech House Publishers (book manuscript reviewing), 1996-2002

Research Grants Council of Hong Kong (proposal evaluator), Feb. 1997-present

Hughes Electronics (expert witness before International Trade Commission), Feb. 1997-July 1997

Mercury Computer, May 1997

Thomson Consumer Electronics (expert witness before International Trade Commission), June 1997-August 1998

Swedish Research Council for Engineering Sciences (proposal evaluator), August 1997

Texas Instruments, 1998-2003

Cirrus Logic, Inc., Dec. 1998-Jan. 2000

Ezenia!, Inc., Jan. 1999-Aug. 2000

Thomson Consumer Electronics (expert witness), Nov. 2000-Feb. 2002; 2007-2008.

Intel, Jan. 2001-April 2001

Bain and Co., Jan. 2001-April 2001

DirecTV, Inc. (expert witness), 2002-2009

DRTV Systems Ltd., April 2002

Pause Technology (expert witness), 2003

Polycom (expert witness), 2003

Forney Corporation (expert witness), 2003-2005

IPIX Corp. (expert witness), 2005  
Motorola, Inc. (expert witness), 2006-2008, 2011-present  
Scientific Atlanta (expert witness), 2006-2008  
Technical Advisor, One Laptop Per Child, 2006-present  
Technical Advisor, TDVision Systems, 2006-present  
Eastman Kodak (expert witness), February 2007-January 2008  
EchoStar (expert witness), 2007-2008  
Funai (expert witness), 2007-2010  
Kyocera Sanyo Telecom and Palm, Inc. (expert witness) 2009-2010  
Thomson Licensing, 2010  
Research in Motion, Ltd. (expert witness), 2011-present  
Twentieth Century Fox Home Entertainment (expert witness), 2011-2012  
HTC, (expert witness), 2011-present

*Department and Institute Committees, Other Assigned Duties*

School of Architecture and Planning Committee on Academic Computing Needs,  
1989-1990  
Freshman advisor and seminar leader, 1990-present  
*The Tech* advisory board, 1991-present  
Independent Activities Period Policy Committee, 1991-1994, 1995-1997  
Media Arts & Sciences Program IAP Coordinator, 1992-present  
Media Arts & Sciences Departmental Committee on Graduate Students, 1994-  
1997, 2005-2006 (acting head, spring semester 1996)  
Committee on the Undergraduate Program Subcommittee on Freshman Advis-  
ing, 1998-1999  
Media Arts & Sciences Undergraduate Officer, 1996-present  
Founder and Director, Media Arts& Sciences Freshman Program, 1999-present

*Government and Other Committees, Service, etc.*

Committee on Open High-Resolution Systems, 1990-1991  
Federal Communications Commission Advisory Committee on Advanced Tele-  
vision Service, Planning Subcommittee Working Party 4, 1992  
Local Arrangements Chair, IEEE International Conference on Multimedia Com-  
puting and Systems, 1994  
Conference Co-Chair, SPIE Conference on Integration Issues in Large Commer-  
cial Media Delivery Systems, 1995, 1996  
Board of Editors, SMPTE Journal, 1995-present

Conference Co-Chair, SPIE Conference on Reconfigurable Technology for Rapid Product Development and Computing, 1996  
General Chair, ACM Multimedia Conference, 1996  
Organizer, Objects of Communication Symposium, 1996  
Conference Co-Chair, SPIE Conference on Multimedia Networks and Applications, 1997, 1998, 1999, 2000  
Conference Co-Chair, SPIE Conference on Media Processors, 1999, 2000, 2001, 2002, 2003, 2004, 2005  
Manuscript reviewer for six journals and three book publishers  
Associate Editor, *Optical Engineering*, 2004-present  
ARDA Exploratory Program Executive Committee member, 2004-2006  
Technical Advisory Panel, Council for Research Excellence, 2005-present  
General Chair, IEEE Consumer Communications and Networking Conference 2006  
Emmy Advanced Media Committee, National Academy of Television Arts and Sciences, 2006-present  
Board of Governors, National Academy of Media Arts and Sciences, 2007-present  
Conference co-chair, SPIE Practical Holography conference, 2011, 2012, 2013  
Conference co-chair, International Symposium on Display Holography, 2012  
Co-Chair, Optical Society of America 3D Display Technology, Perception, and Application Incubator Meeting, 2012

#### *Awards Received*

I.B.M. Communications Doctoral Fellowship, 1986 and 1987  
Sony Corporation Career Development Professorship, 1991-1995  
IEEE ASIC '93 (Conference on Application Specific Integrated Circuits) Speaker's Award, 1993  
IEEE Computer Society Certificate of Appreciation, 1994  
Alex W. Dreyfoos, Jr. Career Development Professorship, 1995-1997  
Marquis Who's Who in Science and Engineering, 1996-1997; Who's Who in the East, 1997, 1998; Who's Who in Entertainment, 1997; Who's Who in America, 2001  
ACM Recognition of Service Award, 1997  
Distinguished Alumnus Award, John Piersol McCaskey High School, Lancaster PA, 1997  
Fellow, IC<sup>2</sup> Institute, University of Texas at Austin, 2001  
Fellow, SPIE, 2002



INDEX: Design to Improve Life Award (as member of team that designed OLPC XO laptop), 2007

Effic Award (bronze) for work on Sprite Slam Dunk Competition, 2013

### *Current Organization Membership*

American Institute of Physics

Association for Computing Machinery (ACM)

Institute of Electrical and Electronic Engineers (IEEE)

Optical Society of America (OSA)

Society of Photo-Instrumentation Engineers (SPIE) (Fellow, 2002-present; Associate Editor, *Optical Engineering*, 2004-2011)

Society of Motion Picture and Television Engineers (SMPTE) (Manager, New England Section, 1993-1995; Board of Editors, 1995-present)

### *Patents*

1. U.S. Patent 4,673,981, "Unrecordable Video Signals," (co-inventors Andrew Lippman and Jerome Wiesner)
2. U.S. Patent 5,185,852, "Antialiasing Apparatus and Method for Computer Printers," (co-inventor Christopher Mayer)
3. U.S. Patent 5,946,425, "Method and Apparatus for Automatic Alignment of Volumetric Images Containing Common Subject Matter," (co-inventor Tamas Sandor)
4. U.S. Patent 6,022,648, "Bistable, Thermochromic Recording Materials for Rendering Color and Gray Scale," (co-inventor Joseph Jacobson).
5. U.S. Patent 6,642,940, "Management of Properties for Hyperlinked Video," (co-inventors Edmond Chalom, Jonathan Dakss, and Nuno Vasconcelos).
6. U.S. Patent 6,816,628, "Methods for Outlining and Filling Regions in Multi-Dimensional Arrays," (co-inventors Karen Sarachik, Jonathan Dakss, and Joshua Wachman).
7. U.S. Patent 6,879,720, "Methods for Outlining and Filling Regions in Multi-Dimensional Arrays," (co-inventors Karen Sarachik, Jonathan Dakss, and Joshua Wachman).
8. U.S. Patent 6,944,228, "Method and Apparatus for Encoding Video Hyperlinks," (co-inventors Jonathan Dakss and Daniel Katcher).
9. U.S. Patent 6,978,053, "Single-Pass Multilevel Methods for Applying Morphological Operators in Multiple Dimensions," (2 co-inventors).
10. U.S. Patent 7,117,517, "Method and Apparatus for Generating Data Structures for a Hyperlinked Television Broadcast," (4 co-inventors).
11. U.S. Patent 7,120,924, "Method and Apparatus for Receiving a Hyperlinked

- Television Broadcast," (5 co-inventors).
12. U.S. Patent 7,249,367, "Method and Apparatus for Switching Between Multiple Programs by Interacting with a Hyperlinked Television Broadcast," (3 co-inventors).
  13. U.S. Patent 7,367,042, "Method and Apparatus for Hyperlinking in a Television Broadcast," (6 co-inventors).
  14. U.S. Patent 7,636,365, "Smart Digital Modules and Smart Digital Wall Surfaces Combining the Same," (3 co-inventors).
  15. U.S. Patent 8,010,986, "Synchronization and Automation in an ITV Environment," (4 co-inventors).
  16. U.S. Patent 8,149,265, "Holographic Video Display System," (3 co-inventors).
  17. U.S. Patent 8,356,329, "Method and Apparatus for Interaction with Hyperlinks in a Television Broadcast," (8 co-inventors).
  18. U.S. Patent applied for 2001, "Program Stream Switching in a Hyperlinked Video Broadcast," (2 co-inventors).
  19. U.S. Patent applied for 2007, "Self-Refreshing Display Controller for a Display Device in a Computational Unit," (3 co-inventors).
  20. U.S. Patent applied for 2009, "Tangible Social Network," (1 co-inventor).
  21. U.S. Patent applied for 2010, "Methods and Apparatus for Holographic Animation," (2 co-inventors).
  22. U.S. Patent applied for 2012, "Methods and Apparatus for Accessing Peripheral Content," (2 co-inventors).
  23. U.S. Patent applied for 2013, "Force-Sensing Net," (3 co-inventors).
  24. U.S. Patent applied for 2013, "Context-Aware Omnidirectional Projector," (4 co-inventors).

*Teaching Experience of V. Michael Bove, Jr.*

FT89, 4.994, Media Arts and Sciences Doctoral Proseminar, taught unit on signals and systems (3 weeks), 10 students  
ST90, 4.998, Digital Image Processing for Hard Copy, 12 students  
FT90, 4.890, Signals and Systems for Media Technology, one of four instructors, 12 students  
FT90, 4A05 (freshman advising seminar), Case Studies in Visual Communications, 9 students  
ST91, 4.964, Digital Image Processing for Hard Copy, 6 students  
FT91, 4.890, Signals and Systems for Media Technology, one of four instructors, 12 students  
FT91, 4A05 (freshman advising seminar), Case Studies in Visual Communications, 9 students  
ST92, 4.964, Digital Image Processing for Hard Copy, 9 students  
FT92, 4.890, Signals and Systems for Media Technology, one of two instructors, 13 students  
FT92, 4A05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
IAP93, "Ernie Kovacs"  
ST93, 4.964, Digital Image Processing for Hard Copy, 8 students  
FT93, MAS101/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 20 students  
FT93, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
IAP94, "A Look Back at Colorization"  
ST94, MAS814, Digital Image Processing for Hard Copy, 8 students  
FT94, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
FT94, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 16 students  
IAP95, "Dimensional Transcendence," one of three instructors  
ST95, MAS814, Digital Image Processing for Hard Copy, 5 students  
FT95, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 7 students  
FT95, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 15 students  
ST96, MAS961, On Being Meta, one of three instructors, 14 students  
FT96, MASA05 (freshman advising seminar), Case Studies in Visual Commu-

nications, 8 students  
 FT96, MAS160/MAS510, Signals, Systems, and Information for Media Technology, sole instructor, 19 students  
 ST97, MAS814, Digital Image Processing for Hard Copy, 7 students  
 ST97, MAS961, On Being Meta, one of three instructors  
 FT97, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
 FT97, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 10 students  
 ST98, MAS816, On Being Meta, one of three instructors  
 FT98, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
 ST99, MAS814, Digital Image Processing for Hard Copy, 12 students  
 ST99, MAS111, Introduction to Doing Research in Media Arts and Sciences, 12 students  
 FT99, MASA09 (freshman advising seminar), Television, Inside and Out, 8 students  
 ST00, MAS111, Introduction to Doing Research in Media Arts and Sciences, 15 students  
 ST00, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 24 students  
 FT00, MASA09 (freshman advising seminar), Television, Inside and Out, 8 students  
 ST01, MAS111, Introduction to Doing Research in Media Arts and Sciences, 25 students  
 ST01, MAS814, Digital Hard Copy, 6 students  
 FT01, MASA09 (freshman advising seminar), Television, Inside and Out, 9 students  
 FT01, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 14 students  
 ST02, MAS111, Introduction to Doing Research in Media Arts and Sciences, 25 students  
 ST02, MAS890, Workshop in Community-Maintainable Online Collaborative Spaces, 20 students  
 FT02, MASA09 (freshman advising seminar), Television, Inside and Out, 9 students  
 ST03, MAS111, Introduction to Doing Research in Media Arts and Sciences, 15 students  
 FT03, MASA18 (freshman advising seminar), Engineering: the Good, the Bad,

and the Ugly, 10 students

FT03, MAS160/MAS510/MAS511, Signals, Systems, and Information for Media Technology, one of two instructors, 24 students

ST04, MAS111, Introduction to Doing Research in Media Arts and Sciences, 15 students

FT04, MASA18 (freshman advising seminar), Engineering: the Good, the Bad, and the Ugly, 7 students

ST05, MAS111, Introduction to Doing Research in Media Arts and Sciences, 15 students

FT05, MAS160/MAS510/MAS511, Signals, Systems, and Information for Media Technology, 14 students

ST06, MAS111, Introduction to Doing Research in Media Arts and Sciences, 10 students

FT06, MASA18 (freshman advising seminar), Engineering: the Good, the Bad, and the Ugly, 11 students

ST07, MAS111, Introduction to Doing Research in Media Arts and Sciences, 10 students

FT07, MASA18 (freshman advising seminar), Engineering: the Good, the Bad, and the Ugly, 10 students

FT07, MAS160/MAS510/MAS511, Signals, Systems, and Information for Media Technology, 12 students

FT07, MAS110, Fundamentals of Computational Media Design, 25 students

ST08, MAS111, Introduction to Doing Research in Media Arts and Sciences, 18 students

FT08, MAS110, Fundamentals of Computational Media Design, 25 students

ST09, MAS111, Introduction to Doing Research in Media Arts and Sciences, 9 students

ST09, MAS963, New Media Storytelling, 10 students

FT09, MAS110, Fundamentals of Computational Media Design, 25 students

FT09, MASA19 (freshman advising seminar), Designing Consumer Electronics, 9 students

ST10, MAS111, Introduction to Doing Research in Media Arts and Sciences, 21 students

ST10, MAS963, New Media Storytelling, 9 students

FT10, MAS110, Fundamentals of Computational Media Design, 28 students

FT10, MASA19 (freshman advising seminar), Designing Consumer Electronics, 10 students

ST11, MAS111, Introduction to Doing Research in Media Arts and Sciences, 12

students

FT11, MAS110, Fundamentals of Computational Media Design, 30 students

FT11, MASA19 (freshman advising seminar), Designing Consumer Electronics,  
10 students

ST12, MAS111, Introduction to Doing Research in Media Arts and Sciences, 20  
students

ST12, MAS160/MAS510/MAS511, Signals, Systems, and Information for Me-  
dia Technology, 6 students

FT12, MAS110, Fundamentals of Computational Media Design, 30 students

FT12, MASA19 (freshman advising seminar), Designing Consumer Electronics,  
10 students

ST13, MAS111, Introduction to Doing Research in Media Arts and Sciences, 20  
students

## Publications of V. Michael Bove, Jr.

### Books

(for book chapters see Other Major Publications)

1. S. A. Benton and V. M. Bove, Jr., *Holographic Imaging*, Wiley, 2008.

### Papers in Refereed Journals

1. V. M. Bove, Jr., "A Probabilistic Method for Integrating Multiple Sources of Range Data," *Journal of the Optical Society of America A*, 7, Dec. 1990, pp. 2193-2198.
2. V. M. Bove, Jr. and A. B. Lippman, "Scalable Open Architecture Television," *SMPTE (Society of Motion Picture and Television Engineers) Journal*, 101, Jan. 1992, pp. 2-5.
- <sup>0</sup> 3. A. Singh and V. M. Bove, Jr., "Multidimensional Quantizers for Scalable Video Compression," *IEEE Journal on Selected Areas in Communications*, 11, Jan. 1993, pp. 36-45.
4. V. M. Bove, Jr., "Entropy-Based Depth from Focus," *Journal of the Optical Society of America A*, 10, Apr. 1993, pp. 561-566.
- <sup>0</sup> 5. K. Tsunashima, J. B. Stampleman, and V. M. Bove, Jr., "A Scalable Motion-Compensated Subband Image Coder," *IEEE Transactions on Communications*, 42, Apr. 1994, pp. 1894-1901.
6. V. M. Bove, Jr. and J. A. Watlington, "Cheops: A Reconfigurable Data-Flow System for Video Processing," *IEEE Transactions on Circuits and Systems for Video Technology*, 5, Apr. 1995, pp. 140-149.
7. V. M. Bove, Jr., "Object-Oriented Television," *SMPTE Journal*, 104, Dec. 1995, pp. 803-807.
8. V. M. Bove, Jr., "Multimedia Based on Object Models: Some Whys and Hows," *IBM Systems Journal*, 35, 1996, pp. 337-348.
9. V. M. Bove, Jr., "Beyond Images," *Convergence: The Journal of Research into New Media Technologies*, 2, Autumn 1996, pp. 30-46.
- <sup>0</sup> 10. J. A. Watlington and V. M. Bove, Jr., "Stream-Based Computing and Future Television," *SMPTE Journal*, 106, April 1997, pp. 217-224.
- <sup>0</sup> 11. J. A. Watlington and V. M. Bove, Jr., "A System for Parallel Media Processing," *Parallel Computing*, 23:12 December 1997, pp. 1793-1809.
- <sup>0</sup> 12. S. Agamanolis and V. M. Bove, Jr., "Multilevel Scripting for Responsive Multimedia," *IEEE Multimedia*, 4:4 October-December 1997, pp. 40-50.
- <sup>0</sup> 13. V. M. Bove, Jr., J. Dakss, S. Agamanolis, E. Chalom, "Adding Hyperlinks to Digital Television," *SMPTE Journal*, 108, November 1999, pp. 795-801.
14. V. M. Bove, Jr. and W. Butera, "The Coding Ecology: Image Coding Via

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<sup>0</sup>Outgrowths of supervised theses or research projects.

Competition among Experts," *IEEE Transactions on Circuits and Systems for Video Technology*, 10, October 2000, pp. 1049-1058.

<sup>o</sup> 15. V. M. Bove, Jr., J. Dakss, E. Chalom, and S. Agamanolis, "Hyperlinked Television Research at the MIT Media Laboratory," *IBM Systems Journal*, 39, 2000, pp. 470-478.

<sup>o</sup> 16. S. Agamanolis and V. M. Bove, Jr., "Viper: a Framework for Responsive Television," *IEEE Multimedia*, 10:3, July-Sept. 2003, pp. 88-98.

<sup>o</sup> 17. V. M. Bove, Jr. and Wilfrido Sierra, "Personal Projection," *SMPTE Motion Imaging Journal*, 113, Jan. 2004, pp. 17-21.

<sup>o</sup> 18. V. M. Bove, Jr. and J. Mallett, "Collaborative Knowledge Building by Smart Sensors," *BT Technology Journal*, 22:4, Oct. 2004, pp. 45-51.

<sup>o</sup> 19. D. Butler, V. M. Bove, Jr., and S. Sridharan, "Real-Time Adaptive Foreground/Background Segmentation," *EURASIP Journal on Applied Signal Processing*, 14:11, Aug. 2005, 2292-2304.

<sup>o</sup> 20. W. Plesniak, M. Halle, V. M. Bove, Jr., J. Barabas, and R. Pappu, "Reconfigurable Image Projection (RIP) Holograms," *Optical Engineering*, 45:11, Nov. 2006.

21. V. M. Bove, Jr., "Holographic Television: What and When?" *SMPTE Motion Imaging Journal*, 120:4, May/June 2011, pp. 36-40.

22. V. M. Bove, Jr., "Engineering for Live Holographic TV" *SMPTE Motion Imaging Journal*, 120:8, November/December 2011, pp. 56-60.

23. V. M. Bove, Jr., "Display Holography's Digital Second Act," *Proceedings of the IEEE*, 100:4, April 2012, pp. 918-928.

<sup>o</sup> 24. S. Jolly, D. E. Smalley, J. Barabas, and V. M. Bove, Jr., "Direct Fringe Writing Architecture for Photorefractive Polymer-Based Holographic Displays: Analysis and Implementation," *Opt. Eng.* 52:5, 055801, 2013, doi: 10.1117/1.OE.52.5.055801

<sup>o</sup> 25. D. E. Smalley, Q. Y. J. Smithwick, V. M. Bove, J. Barabas and S. Jolly, Anisotropic leaky-mode modulator for holographic video displays, *Nature*, 498, 20 June 2013, pp. 313 - 317.

#### *Papers in Refereed Conference Journals*

1. V. M. Bove, Jr., "Pictorial Applications for Range Sensing Cameras," in *SPIE Vol. 901: Image Processing, Analysis, Measurement, and Quality*, Society of Photo-Optical Instrumentation Engineers, Bellingham WA, 1988, pp. 10-17.

2. B. Girod, V. M. Bove, Jr., A. B. Lippman, "Automatic 3-D Scene Modeling from Range and Motion," *Proc. Second International Workshop on 64kbit/s Coding of Moving Video*, Hannover Germany, 1989.

3. V. M. Bove, Jr., "Discrete Fourier Transform Based Depth-from-Focus," *OSA Technical Digest Series Vol. 14: Image Understanding and Machine Vision*, Optical Society of America, Washington DC, 1989, pp. 118-121.



4. V. M. Bove, Jr. and A. B. Lippman, "Open Architecture Television Receivers and Extensible/Intercompatible Digital Video Representations," *Proc. IEEE ISCAS (International Symposium on Circuits and Systems)*, New Orleans LA, 1990, pp. 1294-1297.
5. V. M. Bove, Jr., "Scalable, Spatiotemporal Resolution-Independent Digital Image Format," *Proc. Picture Coding Symposium*, Cambridge MA, 1990, pp. 4.6.1-4.6.4.
6. V. M. Bove, Jr. and A. B. Lippman, "Open Architecture Television," in *A Television Continuum - 1967 to 2017*, SMPTE, White Plains NY, 1991, pp. 210-218.
7. W. R. Neuman, A. N. Crigler, V. M. Bove, Jr., "Television Sound and Viewer Preference," *Proc. AES 9th International Conference*, Detroit MI, 1991.
8. V. M. Bove, Jr. and J. A. Watlington, "Cheops: A Modular Processor for Scalable Video Coding," in *SPIE Vol. 1605*, Society of Photo-Optical Instrumentation Engineers, Bellingham WA, 1991, pp. 886-893.
9. I. J. Shen and V. M. Bove, Jr., "Minimization of Aliasing Artifacts During Partial Subband Reconstruction with Wiener Filters," in *SPIE Vol. 1657*, Society of Photo-Optical Instrumentation Engineers, Bellingham WA, 1992, pp. 14-23.
10. V. M. Bove, Jr. and J. A. Watlington, "Experiments in Hardware and Software for Real-Time Image Sequence Processing," *Proc. IEEE Workshop on Visual Signal Processing and Communications*, Raleigh NC, 1992, pp. 98-103.
11. V. M. Bove, Jr. and E. Chalom, "Open Architecture Television for Motion-Compensated Coding," in *SPIE Vol. 1818*, Society of Photo-Optical Instrumentation Engineers, Bellingham WA, 1992, pp. 1088-1091.
12. V. M. Bove, Jr., "Hardware and Software Implications of Representing Scenes as Data" (invited paper), *Proc. ICASSP-93*, Minneapolis MN, 1993, pp. I-121-I-124.
13. V. M. Bove, Jr., B. D. Granger, and J. A. Watlington, "Real-Time Decoding and Display of Structured Video," *Proc. IEEE ICMCS '94*, Boston MA, 1994, pp. 456-462.
14. V. M. Bove, Jr. and J. A. Watlington, "Structured Video Display on a Data-Flow Processor," *Proc. IEEE Workshop on Visual Signal Processing and Communications*, New Brunswick NJ, 1994, pp. 8-12.
15. V. M. Bove, Jr., "Object-Oriented Television," *Proc. 136th SMPTE Technical Conference*, Los Angeles CA, 1994, paper 136-3.
- <sup>o</sup> 16. J. A. Watlington, M. Lucente, C. J. Sparrell, V. M. Bove, Jr., and I. Tamitani, "A Hardware Architecture for Rapid Generation of Electro-Holographic Fringe Patterns," *Proc. SPIE Practical Holography IX, 2406*, 1995, pp. 172-183.

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- <sup>0</sup> 18. E. Chalom and V. M. Bove, Jr., "Segmentation of Frames in a Video Sequence using Motion and Other Attributes," *Proc. SPIE Digital Video Compression: Algorithms and Technologies*, 2419, 1995, pp. 230-241.
- <sup>0</sup> 19. J. A. Watlington and V. M. Bove, Jr., "Stream-Based Computing and Future Television," *Proc. 137th SMPTE Technical Conference*, New Orleans LA, 1995, pp. 69-79.
- <sup>0</sup> 20. E. K. Acosta, V. M. Bove, Jr., J. A. Watlington, and R. A. Yu, "Reconfigurable Processor for a Data-Flow Video Processing System," *Proc. SPIE FPGAs for Fast Board Development and Reconfigurable Computing*, 2607, 1995, pp. 83-91.
- <sup>0</sup> 21. T. Chang and V. M. Bove, Jr., "Experiments in Real-Time Decoding of Layered Video," *Proc. SPIE Integration Issues in Large Commercial Media Delivery Systems*, 2615, 1995, pp. 99-106.
- <sup>0</sup> 22. E. Chalom and V. M. Bove, Jr., "Segmentation of an Image Sequence using Multi-Dimensional Image Attributes," *Proc. IEEE ICIP-96*, Lausanne, 1996, pp. II-525 - II-528.
23. V. M. Bove, Jr., "Algorithms and Systems for Modeling Moving Scenes," *Proc. EUSIPCO-96 (European Signal Processing Conference)*, Trieste, 1996, pp. 1685-1688.
24. V. M. Bove, Jr., "The Impact of New Multimedia Representations on Hardware and Software Systems," (invited paper) *Proc. SPIE Multimedia Hardware Architectures 1997*, 3021, 1997, pp. 34-39.
- <sup>0</sup> 25. J. Wong, J. Watlington, and V. M. Bove, Jr., "The H-Bus: A Media Acquisition Bus Optimized for Multiple Streams," *Proc. SPIE Multimedia Hardware Architectures 1997*, 3021, 1997, pp. 40-50.
- <sup>0</sup> 26. J. Newbern and V. M. Bove, Jr., "Generation of Blue Noise Arrays by Genetic Algorithm," *Proc. SPIE Human Vision and Electronic Imaging II*, 3016, 1997, pp. 441-450.
- <sup>0</sup> 27. J. A. Watlington and V. M. Bove, Jr., "A System for Parallel Media Processing," *Proc. Workshop on Parallel Processing and Multimedia, IEEE International Parallel Processing Symposium*, Geneva, 1997, pp. 59-74.
- <sup>0</sup> 28. S. Agamanolis and V. M. Bove, Jr., "Reflection of Presence: Toward More Natural and Responsive Telecollaboration," *Proc. SPIE Multimedia Networks*, 3228, 1997, pp. 174-182.
29. V. M. Bove, Jr., "Object-Based Media and Stream-Based Computing," (invited paper) *Proc. SPIE Multimedia Hardware Architectures 1998*, 3311, 1998, pp. 24-29.
30. V. M. Bove, Jr., J. Dakss, S. Agamanolis, E. Chalom, "Adding Hyperlinks to Digital Television," *Proc. 140th SMPTE Technical Conference*, 1998, pp 395-

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33. A. Westner and V. M. Bove, Jr., "Blind Separation of Real World Audio Signals Using Overdetermined Mixtures," *Proc. ICA '99*, 1999, pp. 251-256.
34. A. Westner and V. M. Bove, Jr., "Applying Blind Source Separation and Deconvolution to Real-World Acoustic Environments," *Proc. 106th Audio Engineering Society Convention*, 1999.
35. V. M. Bove, Jr. and W. J. Butera, "The Coding Ecology: Image Coding via Competition among Experts," *Proc. 1999 Picture Coding Symposium*, 1999, pp. 403-406.
36. V. M. Bove, Jr., "Will Anyone Really Need a Web Browser in Five Years?" *Proc. Montreux World Television Forum*, 2000.
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38. W. Butera and V. M. Bove, Jr., "Literally Embedded Processors," *Proc. SPIE Media Processors*, v. 4313, 2001, pp. 29-37.
39. V. M. Bove, Jr. and W. Butera, "Extremely Distributed Multimedia," *Proc. 6th Eurographics Workshop on Multimedia*, 2001.
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- <sup>0</sup>41. W. Butera, V. M. Bove, Jr. and J. McBride, "Extremely Distributed Media Processing," *Proc. SPIE Media Processors*, v. 4674, 2002, pp. 37-41.
- <sup>0</sup>42. V. M. Bove, Jr. and W. Sierra, "Personal Projection," *Proc. SMPTE 144th Technical Conference*, 2002.
- <sup>0</sup>43. D. Butler, S. Sridharan, and V. M. Bove, Jr., "Real-Time Adaptive Video Segmentation," *Proc. ICASSP 2003*, 2003.
- <sup>0</sup>44. V. M. Bove, Jr. and W. Sierra, "Personal Projectors Based on VCSEL Arrays," *Proc. SPIE Projection Displays IX*, v. 5002, 2003, pp. 1-6.
- <sup>0</sup>45. V. M. Bove, Jr. and W. Sierra, "Personal Projection, or How to Put a Large Screen in a Small Device," *Proc. SID 2003 International Symposium, XXXIV*, 2003.
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47. V. M. Bove, Jr., "Media Processing Ecologies," *Proc. IEEE ITRE 2003*, 2003.
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A Computationally-Enhanced Modular Textile System," *Proc. UBICOMP '04*, 2004.

<sup>049.</sup> T. Quentmeyer, W. J. Plesniak, and V. M. Bove, Jr., "Computing Real-Time Holographic Video Content with Off-the-Shelf PC Hardware," *Proc. OSA Frontiers in Optics/Laser Science Meeting*, 2004.

<sup>050.</sup> V. M. Bove, Jr., W. J. Plesniak, T. Quentmeyer, and J. Barabas, "Real-Time Holographic Video Images with Commodity PC Hardware," *Proc. SPIE Stereoscopic Displays and Applications*, 5664A, 2005.

<sup>051.</sup> B. C. Dalton and V. M. Bove, Jr., "Audio-Based Self-Localization for Ubiquitous Sensor Networks," *Proc. 118th Audio Engineering Society Convention*, 2005.

<sup>052.</sup> D. E. Smalley, Q. Y. J. Smithwick, and V. M. Bove, Jr., "Holographic Video Display Based on Guided-Wave Acousto-Optical Devices," *Proc. SPIE Practical Holography XXI*, 6488, 2007.

<sup>053.</sup> V. M. Bove, Jr., D. E. Smalley, and Q. Y. J. Smithwick, "Making Holographic Television a Consumer Product," (invited paper) *Proc. OSA Topical Meeting on Digital Holography and Three-Dimensional Imaging*, 2007.

<sup>054.</sup> Q. Y. J. Smithwick, D. E. Smalley, V. M. Bove, Jr., and J. Barabas, "Progress in Holographic Video Displays Based on Guided-Wave Acousto-Optical Devices," *Proc. SPIE Practical Holography XXII*, 6912, 2008.

<sup>055.</sup> B. T. Taylor and V. M. Bove, Jr., "The Bar of Soap: A Grasp Recognition System Implemented in a Multi-Functional Handheld Device," *Proc. ACM CHI*, 2008.

<sup>056.</sup> J. J. Kalanithi and V. M. Bove, Jr., "Connectibles: Tangible Social Networks," *Proc. 2nd Intl. Conf. on Tangible and Embedded Interaction (TEI'08)*, 2008.

<sup>056.</sup> Q. Y. J. Smithwick, J. Barabas, D. E. Smalley, and V. M. Bove, Jr., "Real-Time Shader Rendering of Holographic Stereograms," *Proc. SPIE Practical Holography XXIII*, 7233, 2009.

<sup>057.</sup> B. T. Taylor and V. M. Bove, Jr., "Graspables: Grasp-Recognition as a User Interface," *Proc. ACM CHI*, 2009.

<sup>058.</sup> V. M. Bove, Jr., Q. Y. J. Smithwick, J. Barabas, and D. E. Smalley, "Is 3-D TV Preparing the way for Holographic TV?" *Proc. 8th International Symposium on Display Holography*, 2009.

<sup>059.</sup> A. L. Santos and V. M. Bove, Jr., "uCom: Spatial Displays for Visual Awareness of Remote Locations," *Proc. ACM CHI 2010*, 2010.

<sup>060.</sup> J. Barabas, Q. Y. J. Smithwick, and V. M. Bove, Jr., "Evaluation of Rendering Algorithms for Presenting Layered Information on Holographic Displays," *Proc. SID 10 Digest*, 2010.

<sup>61.</sup> V. M. Bove, Jr., "What is Holographic Television, and Will it Ever be in My Living Room?" *Proc. 2010 SMPTE International Conference on Stereoscopic*

*3D for Media and Entertainment*, 2010.

<sup>o</sup>62. J. Barabas, S. Jolly, D. E. Smalley, and V. M. Bove, Jr., "Diffraction Specific Coherent Panoramagrams of Real Scenes," *Proc. SPIE Practical Holography XXV*, 7957, 2011.

63. V. M. Bove, Jr., "Live Holographic TV: From Misconceptions to Engineering," *Proc. 2011 SMPTE International Conference on Stereoscopic 3D for Media and Entertainment*, 2011.

<sup>o</sup>64. E. Portocarrero, D. Cranor, and V. M. Bove, Jr., "Pillow-Talk: Seamless Interface for Dream Priming Recalling and Playback," *Proc. TEI '11*, 2011.

<sup>o</sup>65. D. Cranor, A. Peyton, A. Persaud, R. Bhatia, S. Kim, and V. M. Bove, Jr., "ShakeOnIt: An Exploration Into Leveraging Social Rituals for Information Access," *Proc. TEI '11*, 2011.

<sup>o</sup>66. J. Barabas, S. Jolly, D. E. Smalley, and V. M. Bove, Jr., "Depth Perception and User Interface in Digital Holographic Television," *Proc. SPIE Practical Holography XXVI*, 8281, 2012.

<sup>o</sup>67. S. Jolly and V. M. Bove, Jr., "Direct Optical Fringe Writing of Diffraction Specific Coherent Panoramagrams in Photorefractive Polymer for Updatable Three-Dimensional Holographic Display," *J. Phys.: Conf. Ser.* 415, 012054, 2013.

<sup>o</sup>68. D. Smalley, Q. Smithwick, J. Barabas, V. M. Bove, Jr., S. Jolly, and C. Della Silva, "Holovideo for Everyone: a Low-Cost Holovideo Monitor," *J. Phys.: Conf. Ser.* 415, 012055, 2013.

<sup>o</sup>69. J. Barabas and V. M. Bove, Jr., "Visual Perception and Holographic Displays," *J. Phys.: Conf. Ser.* 415, 012056, 2013.

<sup>o</sup>70. S. Jolly, D. E. Smalley, J. Barabas, and V. M. Bove, Jr., "Progress in Updatable Photorefractive Polymer-Based Holographic Displays via Direct Optical Writing of Computer-Generated Fringe Patterns," *Proc. SPIE Practical Holography XXVII*, 8644, 2013.

#### *Other Major Publications*

1. W. Bender, V. M. Bove, Jr., A. Lippman, L. Liu, J. Watlington, "High Definition Systems in the 1990s: Open Architecture and Computational Video," *HDTV World Review*, 1:3, Summer 1990, pp. 11-15.

2. V. M. Bove, Jr., "Advanced TV should be Open Architecture" (opinion column), *TV Technology*, August 1992, p. 7.

3. A. Lippman and V. M. Bove, Jr., "ATV Profile: Contribution to the Requirements Discussion," ISO/IEC JTC1/SC29/WG11 MPEG92/759, 1992.

4. V. M. Bove, Jr., "Scalable (Extensible, Interoperable) Digital Video Representations" (book chapter), A. B. Watson, ed., *Digital Images and Human*

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<sup>o</sup>Outgrowths of supervised theses or research projects.

*Vision*, MIT Press, Cambridge MA, 1993, pp. 23-34.

5. V. M. Bove, Jr., "What's Wrong with Today's Video Coding?" (opinion column), *TV Technology*, February 1995, p. 7.
6. V. M. Bove, Jr. and A. B. Lippman, "Television," *World Book Encyclopedia*, Vol. 19, World Book, Chicago IL, 1995, pp. 124-128.
7. N. Negroponte and V. M. Bove, Jr., "Object Oriented Television," *Wired*, July 1996, p. 188.
8. V. M. Bove, Jr., *et al.*, Comment on FCC 96-207, Fifth Further Notice of Proposed Rule Making in the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, 1996.
9. V. M. Bove, Jr., N. Miyaho, and D. A. Harris, introductory chapter, *Multimedia Communication Networks: Technologies and Services*, M. Tatipamula and B. Khasnabish, eds., Artech House, Norwood MA, 1997.
10. V. M. Bove, Jr., "Online to the Future" (opinion column), *The Sunday Times* (London), October 4, 1998.
11. V. M. Bove, Jr., "Communication," *The New Book of Knowledge*, Grolier, Bethel CT, 2000, pp. 462-471.
12. V. M. Bove, Jr., "Astronauts and Mosquitos" (opinion column), *Communications of the ACM*, March 2001, p. 48.
13. V. M. Bove, Jr., "Connected by Media" (opinion column), *IEEE Multimedia*, Oct. 2001.

#### *Invited Lectures and Seminars*

1. "Model Building Cameras," National Computer Graphics Association, Philadelphia PA, April 18, 1989.
2. "Extensible/Intercompatible Digital Video Representations," EIA Digital Advanced Television Workshop, Washington DC, November 7, 1989.
3. "Television of Tomorrow," ILP Symposium on Telecommunications Technology and Policy for the 21st Century, M.I.T., April 24, 1990.
4. "Open Architecture Television," Symposium on the Media Laboratory 5th Anniversary, M.I.T., October 2, 1990.
5. "Open Architecture Television," EIA/IEEE Second International Workshop on Digital Video Communications, Cambridge MA, November 26, 1990.
6. "Scalable Video Representations for Visual Information Services," National Engineering Consortium Information Networking ComForum, Orlando FL, December 14, 1990.
7. "Scalable (Extensible, Interoperable) Video Coding," National Research Council Visual Factors in Electronic Image Communications Conference, Woods Hole MA, July 22, 1991.
8. "Scalability and Open Architecture," Digital Television Symposium, M.I.T.,

May 21, 1992.

9. "A Future Model for HDTV," Production '93, Montreal, May 26, 1993.
10. "Hardware and Software Implications of Representing Scenes as Data," (banquet address) IEEE Conference on Application Specific Integrated Circuits '93, Rochester NY, September 29, 1993.
11. "Some Thoughts on Image Representations, Scene Representations, and Hardware/Software Architectures," IEEE International Conference on Computer Design '93, Cambridge MA, October 4, 1993.
12. "Image and Scene Representations and System Architectures," EIA Digital Advanced Television Workshop, Cambridge MA, October 14, 1993.
13. "Machines Behind the Scenes: Computation and Structured Video," Perspectives Lecture Series, M.I.T., April 26, 1994.
14. "Object-Oriented Television," Joint New England SIGGRAPH/New England SMPTE Meeting, Cambridge MA, October 27, 1994.
15. "Object-Oriented Television," Symposium on The Digital Revolution and its Effect on Japanese Industry (sponsored by Kodansha Publishing), Tokyo, March 15, 1995.
16. "Multimedia Computing: Parallelism without Pain," IEEE Workshop on Multimedia Processors (part of ICMCS '95), Washington DC, May 19, 1995.
17. "Stream-Based Computing and Future Television," EIA/IEEE-CES Digital Television Workshop, Philadelphia, October 5, 1995.
18. "Eyes, Cameras, Objects," Symposium on the Media Laboratory 10th Anniversary, M.I.T., October 10, 1995.
19. "Future Television: Why We Need All Those MIPS and Where We're Going to Get Them," Princeton University Dept. of Electrical Engineering, October 24, 1995.
20. "The Likely Convergence of Multimedia, Video, Communications, and Computing" (panel discussion), Photonics East '95, Philadelphia, October 24, 1995.
21. "Trends to Watch For in Consumer (and Professional) Multimedia," ComExpo, Houston TX, January 11, 1996.
22. "Multimedia Trends," Texas Instruments National Sales Meeting, Dallas TX, April 23, 1996.
23. "Object-Based Multimedia," Objects of Communication Symposium, M.I.T., May 22, 1996.
24. "Object-Based Media and Why It's a Good Problem," Bell Laboratories, Murray Hill NJ, August 28, 1996.
25. "The Future of Electronic Visual Communications," Medientage München, Munich, October 17, 1996.
26. "Hardware and Software Impacts of New Media Representations," ACM Workshop on Media Processors (part of ACM MM'96), Boston, November 19,

1996.

27. "Convergence in the 21st Century" (panel discussion), SPIE International Symposium on Voice, Video and Data Communications, Boston, November 20, 1996.
28. "Object-Based Media," Hewlett-Packard Laboratories, Palo Alto CA, February 11, 1997.
29. "Stream-Based Media Computing: What, How, and Why," University of California at Berkeley Dept. of EECS, January 30, 1998.
30. "Responsive Object-Based Media," Greater Boston ACM, February 19, 1998.
31. "Stream-Based Media Processing," American Physical Society Symposium on the Physics of Imaging, Rochester NY, April 24, 1998.
32. "The Future of Media is Object-Based," Southeastern Mass. MIT Alumni Club, New Bedford MA, May 20, 1998.
33. "Object-Based Media and Stream-Based Computing," First International Workshop on Advanced Graphics and Multimedia Systems, Naples Italy, November 17, 1998.
34. "The Object-Based Media Group," Mitsubishi Electric Research Laboratory, Cambridge MA, December 11, 1998.
35. "The Object-Based Media Group," Stanford University Computer Science Dept., January 29, 1999.
36. "Hyperlinked Television as an E-Commerce Portal," Vanguard Technology Transfer Institute, Cambridge MA, May 17, 1999.
37. "Video and the Internet: TV or not TV?" American Museum of the Moving Image, New York, December 8, 1999.
38. "Will Anyone Really Need a Web Browser in Five Years?" Canadian Institute for Telecommunication Research annual meeting, Ottawa, August 28, 2000.
39. "Imaging at the MIT Media Lab" (plenary speaker), IS&T PICS 2001, Montreal, April 23, 2001.
40. "The Future" (panel discussion), ITV Content E-mergency, Columbia University, New York, July 17, 2001.
41. "Responsive Media: The Intersection between Broadcast and Personalization," The Interactive TV Show USA, New York, August 16, 2001.
42. "Development of Technology from Unlikely Sources," Canadian Undergraduate Technology Conference, Toronto, January 17, 2002.
43. "Sharing and Playing Well with Others: Everything We Need to Know about the Future, We Learned in Kindergarten," (keynote) IDC Imaging Convergence Forum, New York, August 7, 2002.
44. "Really Smart Cameras and Sugar-Cube-Sized Video Projectors," MIT



- Family Weekend, Cambridge MA, October 18, 2003.
45. "Computational Ecosystems," Ubi-Comp Symposium on Ubiquitous Computing, Seoul, December 10, 2003.
  46. "Really Smart Cameras and Sugar-Cube-Sized Video Projectors," MIT Alumni Club of RI, Warwick RI, April 13, 2004.
  47. "The Consumer Electronics Laboratory at the MIT Media Laboratory," GSPx, Santa Clara CA, September 29, 2004.
  48. "Really Smart Cameras and Sugar-Cube-Sized Video Projectors," MIT Alumni Club of Cape Cod, Hyannis MA, November 17, 2004.
  49. "Consumer Electronics Research at the MIT Media Lab," Harvard Business School Entrepreneurship Conference, March 3, 2005.
  50. "Changing Dynamic in Consumer Electronics," 2005 Perspective Forum, Berkeley CA, March 9, 2005.
  51. "View from the Consumer Electronics Laboratory," 2005 North American Broadcasters Association General Meeting, Toronto, May 18, 2005.
  52. "Musings – and a Few Facts – about 3-D TV," MIT CIPS Workshop on Advanced Television, Cambridge, January 21, 2009.
  53. "Holographic Video and 3-D Television," "Photons, Neurons and Bits: Holography for the 21st Century," Cambridge MA, March 7, 2009.
  54. "From 3-D TV to Holographic TV," Microsoft Hardware Day, Redmond WA, August 5, 2009.
  55. "Debunking Hollywood's Holograms," MIT Museum, Cambridge MA, December 11, 2009.
  56. "Moving Holographic TV from the Lab to Your Living Room," New England Section, Optical Society of America, Cambridge MA, 20 October 2010.
  57. "Hollywood's Holograms (and MIT's)" and "Pattern Recognition is Everywhere." (2 lectures), Connecticut Science Education Conference, Hamden CT, 30 October 2010.
  58. "A Look Back – and Forward – at Holographic TV," New England SID and SMPTE joint meeting, Needham MA, 18 January 2012.
  59. "Holographic Video and How it Might Become Part of the 3D Ecosystem," Third Workshop on 3D Cinematography (part of CVPR 2012), Providence RI, 16 June 2012.
  60. "A Look Back – and Forward – at Holographic TV," IEEE Photonics Laser Workshop, Lexington MA, 7 November 2012.

### *Research Funding*

Television of Tomorrow Consortium, 1989-1996  
 Digital Life Consortium, 1997-present  
 Intel Digital Expression Project, 2000-2002

*Although one of several researchers on the above two contracts, I accounted for a major portion of the research volume. On Television of Tomorrow, for example, I typically supported six research assistants and five UROP students as well as a \$150,000 fabricated equipment budget annually. I was responsible for approximately a third of the \$2M annual research volume.*

Movies of the Future Consortium, 1989-1994, (supported one research assistant annually)

DARPA Contract DAAD 05-90-C-0333, "Scalable Video," 1990-1993, (supported one research assistant annually)

Bell Northern Research, "Video Coding Testbed," \$30,000 annually, 1991-1993

NASA SRC-B093-93-043, "High Speed Research," (subcontractor to Honeywell Technology Center), project approved to begin in 1995 but funds were never released by NASA

Broadercasting Special Interest Group, Principal Investigator, 1999-2002

NASA Hierarchical Learning Networks, Principal Investigator, \$250,000 annually, 2002-2005

"Smart Architectural Surfaces," ICU/Korean Ministry of Information and Communications, 2003-2004

CELab (consumer electronics research program), Principal Investigator, 2004-present

Center for Future Storytelling, co-director, 2008-present

Office of the Director of National Intelligence (ODNI), Intelligence Advanced Research Projects Activity (IARPA), through the AFRL contract FA8650-10-C-7034, 2010-2012

#### *Theses Supervised by V. Michael Bove, Jr.*

##### *SB Theses*

Chun, Jang H., *Decoding Data in the NTSC Chrominance Channel*, EECS SB, June 1990.

Davis, Desmond O., *Encoding Digital Data in the NTSC Chrominance Channel*, EECS SB, June 1990.

Lee, David S., *Compression of Images Using Zero Crossings of Bandpass Signals*, EECS SB, June 1990.

Blount, Alan W., *Display Manager for a Video Processing System*, EECS SB, June 1991.

Mitchell, Michael D., *X Windows for an Intelligent Display*, EECS SB, June 1991.

Tewari, Rajeev, *The Cheops Input Module: A Real Time Digitizing and Filtering Engine*, EECS SB, June 1991.

Chackerian, Mark, *A Motion-Estimating Board for the Cheops Imaging System*, EECS SB, May 1992.

Kwon, Chris C., *A Stream Processor for Vector Quantized Images*, EECS SB, May 1992.

Lawai, Adnan H., *Scalable Subband Coding for Continuously Variable Raster Sizes*, EECS SB, May 1992.

Nanayakkara, Prasath S. W., *Communication Protocol for a Digital Video Processor*, EECS SB, May 1992.

Evanco, Kathleen L., *A Compiler for an Object-Oriented Parallel Stream Processing Language*, EECS SB, May 1993.

O, Cholwon, *Motion Compensation Decoder for Cheops Imaging System*, EECS SB, May 1993.

Yu, Jung, *Real-Time Image Morphing, Motion Compensation, and Hidden Surface Removal*, EECS SB, May 1994.

Hsieh, P. Angela, *Solutions for Bus Bandwidth Limitations in a Network Printing Environment*, EECS SB, May 1994.

Sung, Julie, *Image Segmentation using Multi-Dimensional Attributes*, Physics SB, May 1997.

#### SM Theses

Liu, Lin L., *Digital Intermediate Format for Video Frame Rate Conversion*, EECS SM, September 1990.

Mayer, Christopher M., *Antialiasing Methods for Laser Printers*, EECS SM, June 1991.

Woo, Peter H., *An Accumulating Frame Buffer Architecture for a High-Performance Graphics Engine*, EECS SM, June 1991.

Firestone, Scott S., *VideoChannel: A Real Time Window Processor*, EECS SM, February 1992.

Eldridge, Creighton L., *A Smart Memory for Processing Images*, EECS SM, May 1992.

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# **EXHIBIT 3**

Patent No. 8,045,952  
Petition For *Inter Partes* Review

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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Yamaha Corporation of America  
Petitioner

v.

Black Hills Media, LLC  
Patent Owner

Patent No. 8,045,952  
Issue Date: October 25, 2011  
Title: METHOD AND DEVICE FOR  
OBTAINING PLAYLIST CONTENT OVER A NETWORK

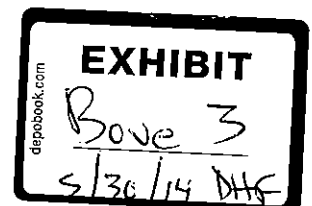
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*Inter Partes* Review No. \_\_\_\_\_

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**PETITION FOR *INTER PARTES* REVIEW**

**UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.100 *et seq.***





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**Exhibit List for Inter Partes Review of U.S. Patent No. 8,045,952**

<b>Exhibit Description</b>	<b>Exhibit #</b>
<i>U.S. Patent No. 8,045,952 to Qureshey et al.</i>	1001
<i>Declaration of Dr. V. Michael Bove, Jr.</i>	1002
<i>U.S. Patent Application No. 09/805,470</i>	1003
<i>U.S. Provisional Patent Application No. 60/072,127</i>	1004
<i>U.S. Patent Application No. 09/096,703</i>	1005
<i>U.S. Provisional Patent Application No. 60/246,842</i>	1006
<i>Office Action dated February 2, 2011</i>	1007
<i>Amendment dated April 4, 2011</i>	1008
<i>Notice of Allowance dated June 29, 2011</i>	1009
<i>Notice of Allowance dated August 30, 2011</i>	1010
<i>Patent Owner ITC Claim Chart re Toshiba</i>	1011
<i>U.S. Patent No. 6,502,194 to Berman et al.</i>	1012
<i>U.S. Patent No. 6,587,127 to Leeke et al.</i>	1013
<i>U.S. Patent No. 7,472,353 to Wolff et al.</i>	1014
<i>Lansonic DAS-750 Reference Materials</i>	1015
<i>U.S. Patent No. 5,616,876 to Cluts</i>	1016

Petitioner Yamaha Corporation of America (“Petitioner”) respectfully petitions for *inter partes* review of claims 9, 10, 13, and 14 of U.S. Patent No. 8,045,952 (“the '952 patent” (Ex. 1001)) in accordance with 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42.100 *et seq.*

## I. NOTICES AND STATEMENTS

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner identifies Yamaha Corporation of America as the real party-in-interest.

Pursuant to 37 C.F.R. § 42.8(b)(2), Petitioner identifies the related matters in Sections III and IV.

Pursuant to 37 C.F.R. § 42.8(b)(3), Petitioner identifies the following counsel (and a power of attorney accompanies this Petition).

<b>Lead Counsel</b>	<b>Backup Counsel</b>
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Pursuant to 37 C.F.R. § 42.8(b)(4), service information for lead and back-up counsel is provided above.

Pursuant to 37 C.F.R. § 42.104(a), Petitioner certifies that the '952 patent is available for *inter partes* review and that the Petitioner is not barred or estopped

from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

## **II. INTRODUCTION**

The '952 patent is directed to a method of receiving a playlist identifying a plurality of songs, receiving information enabling the electronic device to obtain the plurality of songs from a remote source, and obtaining the plurality of songs from the remote source.

Such operations were well known and disclosed by numerous prior art references. Receipt of playlists and song data corresponding to the songs identified by a playlist over a network was common well before the effective date of invention for the '952 patent.

In this Petition, Petitioner presents five separate references that anticipate or render obvious various claims. Section V of this Petition summarizes the '952 patent and its prosecution history. Section VII sets forth the detailed grounds for invalidity of claims 9, 10, 13, and 14. This showing is accompanied by the Declaration of Dr. V. Michael Bove, Jr. ("Bove Decl.," Ex. 1002.) Accordingly, Petitioner respectfully requests a Decision to institute *inter partes* review.

## **III. CO-PENDING LITIGATIONS**

On May 22, 2012, the Patent Owner filed suit against Petitioner Yamaha Corporation of America in the U.S. District Court for the District of Delaware

alleging, *inter alia*, infringement of the '952 patent and related U.S. Patent No. 8,050,652 to Qureshey *et al.* ("the '652 patent"). See *Black Hills Media, LLC v. Yamaha Corp. of America*, No. 1:12-cv-00635-RGA (D. Del.). Plaintiff never served the original Complaint, but instead filed a September 12, 2012 First Amended Complaint that was not served until September 19, 2012. Thus, this petition has been filed within one year of Petitioner being served a complaint alleging infringement of the '952 patent. 35 U.S.C. § 315(b); 37 CFR § 42.101(b).

The Patent Owner has also filed lawsuits alleging infringement of the '952 and '652 patents against Pioneer (1:12-cv-00634), Logitech (1:12-cv-00636), Sonos (1:12-cv-00637), LG (1:13-cv-00803), Sharp (1:13-cv-00804), Toshiba (1:13-cv-00805), and Panasonic (1:13-cv-00806) in the District of Delaware, and against Samsung (2:13-cv-00379) in the Eastern District of Texas. On August 5, 2013, the Delaware Court transferred four of the cases to the Central District of California, where the Yamaha (2:13-cv-06054), Pioneer (2:13-cv-05980), Logitech (2:13-cv-06055), and Sonos (2:13-cv-06062) cases are now pending.

The Patent Owner also filed a recently instituted Section 337 action in the U.S. International Trade Commission against LG, Sharp, Toshiba, Panasonic, and Samsung alleging, *inter alia*, infringement of the '952 and '652 patents. See *Certain Digital Media Devices, Including Televisions, Blu-Ray Disc Players, Home Theater Systems, Tablets and Mobile Phones, Components Thereof and*

*Associated Software*, Inv. No. 337-TA-882 (USITC). All of the above cases are currently pending.

#### **IV. RELATED PETITION**

The '952 and '652 patents are both continuations of Application No. 09/805,470 (Ex. 1003) and share the same specification. Petitioner is concurrently filing a petition for *inter partes* review of the '652 patent.

#### **V. THE '952 PATENT**

##### **A. Background**

As noted above, the '952 patent is directed to a method of receiving a playlist identifying a plurality of songs, receiving information enabling the electronic device to obtain the plurality of songs from a remote source, and obtaining the plurality of songs from the remote source. Exemplary arrangements are illustrated in FIGS. 15 and 19B, reproduced below.

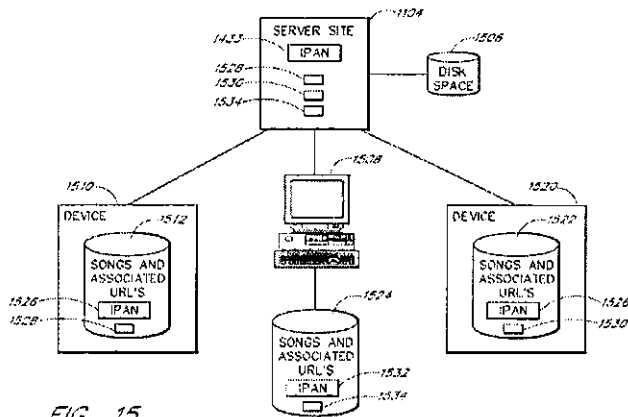


FIG. 15

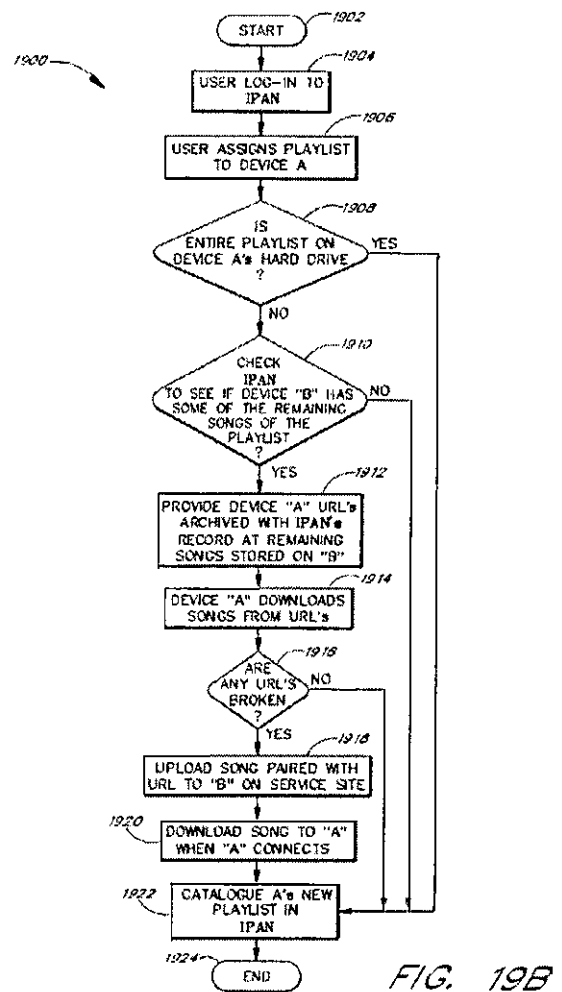


FIG. 19B

As described at 28:11-30:26 with reference to FIGS. 15, 19B, and 19C, a user at PC 1508 may log-in to server site 1104 and, at the server, may assign a playlist to a separate device, network-enabled audio device 1510. The network-enabled audio device may not be connected to the server, in which case the server downloads the playlist to the device as soon as the device connects. (See, e.g., 16:67-17:2.)



Each network-enabled audio device (*e.g.*, device 1510 and device 1520) has a storage space for storing songs and associated uniform resource locators (URLs). Some of the songs identified by the playlist may already be stored on device 1510, in which case no audio data is downloaded. However, some songs may be missing. After determining that one or more songs on the playlist are not stored on device 1510, the server site 1104 creates a list of remaining songs that need to be downloaded to device 1510. The server site determines whether the songs on the list are present on another network-enabled audio device 1520. If so, device 1510 is provided with a list of URLs of the remaining songs on device 1520. The device 1510 may then download the remaining songs from the device 1520 using the URLs provided by the server site 1104.

## **B. Prosecution History**

### **1. Office Action and Response**

The '952 patent issued at the end of a chain of applications. The chain began in 1998 with provisional Application No. 60/072,127 (“the '127 provisional application,” Ex. 1004) filed on January 22, 1998, and Application No. 09/096,703 (“the '703 application,” Ex. 1005) filed on June 12, 1998. Playlists were not disclosed in either the original '127 provisional application or the '703 application.

In 2000-2001, new disclosures, including playlists, were added in provisional Application No. 60/246,842 (“the '842 provisional application,” Ex.

1006) filed on November 8, 2000 and continuation-in-part Application No. 09/805,470 (“the '470 application,” Ex. 1003) filed on March 12, 2001.

The application which ultimately issued as the '952 patent was filed on November 27, 2006 as Application No. 11/563,227 with 26 claims. It was a continuation of the '470 application and claims priority to the '470 and '703 applications as well as the '127 and '842 provisional applications.

An Office Action was mailed on February 2, 2011. In this Office Action (Ex. 1007), all of the claims were rejected for nonstatutory double patenting based upon the applicants' co-pending Application No. 11/563,232 (“the '232 application”) and the '470 application. The applicants filed a terminal disclaimer with respect to the '232 application and indicated that the '470 application had been abandoned. (Apr. 4, 2011 Amendment, Ex. 1008.) In response to the terminal disclaimer, the Examiner issued a Notice of Allowance. (June 29, 2011 Notice of Allowance, Ex. 1009.) The applicants filed an RCE with an amendment to the title, and the Examiner then issued another Notice of Allowance. (Aug. 30, 2011 Notice of Allowance, Ex. 1010.) The issue fee was paid, and the '952 patent issued on October 25, 2011.

## **VI. EFFECTIVE FILING DATE AND CLAIM CONSTRUCTION**

### **A. Effective Filing Date**

Each of the independent claims of the '952 patent recites, *inter alia*, a “playlist identifying a plurality of songs.” The original '127 provisional application and the '703 application were filed in 1998 with FIGS. 1-8 and 1-10, respectively. Neither the specifications nor the drawings of these applications even mention the word “playlist.” Disclosure of playlists was not included until the 2000 filing of the '842 provisional application, which added 29 new drawing sheets and accompanying description. Therefore, the earliest possible effective filing date of the '952 patent is November 8, 2000, which was the filing date of the '842 provisional application.

### **B. Claim Construction**

Petitioner notes that a claim is given the “broadest reasonable construction in light of the specification” in *inter partes* review. *See* 37 C.F.R. § 42.100(b). Petitioner submits that the terms of the challenged claims of the '952 patent are to be given their broadest reasonable interpretation as understood by one of ordinary skill in the art and consistent with the disclosure. The terms “playlist assigned to the electronic device” and “wherein ones of the plurality of songs are not stored on the electronic device” warrant additional discussion as to their broadest reasonable interpretation consistent with the specification.

## 1. “Playlist Assigned to the Electronic Device”

The term “playlist assigned to the electronic device” appears in independent claim 9. Independent claims 1 and 15 include the related steps of “assigning a playlist to an electronic device” and “assign a playlist to one of the plurality of electronic devices,” respectively. The operation of assigning playlists is described in the specification in connection with FIGS. 15, 17, and 19 at 4:50-5:3, 21:40-23:5, 24:44-60, and 28:11-30:26.

The Summary of the Invention states that an aspect of the claimed invention “is a method for assigning playlists of music from one electronic device to another” and “[t]he software module allows a user to assign a playlist from a first device to a second device.” (4:50-58.) FIG. 17C illustrates the assigning operation by selecting “Make available on” and selecting a device. As stated at 24:50-53, “[t]he user can choose the menu option of ‘Make Available On’ to assign the playlist from one device to another, (*e.g.* from device 1510 to device 1520).” The entire discussion of assigning playlists is of assigning a playlist from one device to another by selecting the device to which the playlist is to be transferred. The term “playlist assigned to the electronic device” should therefore be construed as a list of songs that is to be transferred to a particular device selected by the user. (Bove Decl. ¶¶ 12-14.)

In co-pending litigation, the Patent Owner has contended that the term “playlist assigned to the electronic device” includes a playlist that has been requested without any device selection, *i.e.*, without any act of assigning to the device. (*See, e.g.*, “Patent Owner ITC Claim Chart re Toshiba” (Ex. 1011), at 4-5.) Accordingly, although it is submitted that the Patent Owner’s construction is not correct, the claim charts in the following sections take into account both the proper construction presented by Petitioner and the incorrect, broader construction asserted by the Patent Owner.

**2. “Wherein Ones of the Plurality of Songs Are Not Stored on the Electronic Device”**

The term “wherein ones of the plurality of songs are not stored on the electronic device” appears in independent claim 9 of the '952 patent. The specification describes network-enabled electronic devices 1510 and 1520, each having its own storage space to store songs. When a playlist is assigned to a device, songs not stored on the device are provided to the device and stored. (*See, e.g.*, FIG. 15; 21:40-22:15.) The plain language of claim 9 implies that the electronic device can store songs. Otherwise, the limitation has no meaning. *See, e.g., Lantech, Inc. v. Keip Mach. Co.*, 32 F.3d 542, 546 (Fed. Cir. 1994) (“All limitations of a claim must be considered meaningful.”); *see also* Bove Decl. ¶ 16.

In the Summary of the Invention section, the specification explains at 3:57-4:9 that an embodiment of the audio device may not have a disk for storage.

However, there is no disclosure of an implementation of such a device, and this would be inconsistent with the claim language. Selecting a playlist for playback is not the same operation as assigning a playlist to a device. The assigning operation is described throughout the specification as selecting a device and transferring songs to the device for storage. In this regard, the Examiner in the original prosecution of the '227 application considered that the device had memory to store songs, as noted in the Office Action dated February 2, 2011:

Regarding claims 1, 9, and 15, none of the prior arts of record, in combination or individual, show or make it obvious a network-enable audio device of identifying ones of the plurality of songs in the playlist that are not stored on the electronic device and providing information to the electronic device enabling the electronic device to obtain the ones of the plurality of songs that are not stored on the electronic device from at least one remote source (*check the electronic device's data storage space for songs listed on the assigned playlist and a network connection is made to upload the file if the songs needed to from the playlist are not stored on the electronic device's data storage space, see specification 0021*).

(Ex. 1007 at 3-4 (emphasis added).)

The manner in which the Examiner read the claim language demonstrates how one of ordinary skill in the art would have construed the claim. *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1347 (Fed. Cir. 2005) (“Although unilateral statements by an examiner do not give rise to a clear disavowal of claim

scope by an applicant, it does not necessarily follow that such statements are not pertinent to construing claim terms. Statements about a claim term made by an examiner during prosecution of an application may be evidence of how one of skill in the art understood the term at the time the application was filed.”).

Accordingly, “wherein ones of the plurality of songs are not stored on the electronic device,” read consistently with the specification, requires that the electronic device must have a storage space capable of storing songs. In other words, “wherein ones of the plurality of songs are not stored on the electronic device” cannot be construed to encompass an electronic device that has no storage space for songs at all. (Bove Decl. ¶¶ 15-18.)

In co-pending litigation, the Patent Owner has asserted that certain products infringe despite the fact that they do not have storage for storing songs. (*See, e.g.*, Ex. 1011.) Once again, although it is submitted that a construction not requiring an ability to store songs is incorrect, the claim charts in the following sections apply to both the proper construction presented by Petitioner and the incorrect, broader construction asserted by the Patent Owner in co-pending litigation.

## **VII. IDENTIFICATION OF CHALLENGE**

Pursuant to 37 C.F.R. § 42.104(b), Petitioner respectfully requests the cancellation of claims 9, 10, 13, and 14 of the '952 patent based on the grounds of invalidity set forth in this Petition.

**A. Statutory Grounds For The Challenge Of Each Claim**

The statutory grounds for the challenge of each claim are set forth below.

All the statutory citations are pre-AIA.

**1. Grounds Based on U.S. Patent No. 6,502,194 to Berman**

**Ground 1** – Anticipation under 35 U.S.C. § 102(e) of claims 9, 10, and 14 based on U.S. Patent No. 6,502,194 to Berman *et al.* (“Berman,” Ex. 1012).

**Ground 2** – Obviousness under 35 U.S.C. § 103(a) of claim 13 in view of Berman.

**2. Grounds Based on U.S. Patent No. 6,587,127 to Leeke**

**Ground 3** – Anticipation under 35 U.S.C. § 102(e) of claims 9, 10, 13, and 14 based on U.S. Patent No. 6,587,127 to Leeke *et al.* (“Leeke,” Ex. 1013).

**Ground 4** – Obviousness under 35 U.S.C. § 103(a) of claims 9, 10, 13, and 14 in view of Leeke.

**3. Grounds Based on U.S. Patent No. 7,472,353 to Wolff**

**Ground 5** – Anticipation under 35 U.S.C. § 102(e) of claims 9, 10, and 14 based on U.S. Patent No. 7,472,353 to Wolff *et al.* (“Wolff,” Ex. 1014).



**Ground 6** – Obviousness under 35 U.S.C. § 103(a) of claims 9, 10, and 14 in view of Wolff.

**Ground 7** – Obviousness under 35 U.S.C. § 103(a) of claim 13 in view of Wolff.

**4. Grounds Based on Lansonic DAS-750 Web Materials**

**Ground 8** – Anticipation under 35 U.S.C. § 102(e) of claims 9, 10, and 14 based on reference materials relating to the Lansonic DAS-750 (“Lansonic,” Ex. 1015).

**Ground 9** – Obviousness under 35 U.S.C. § 103(a) of claims 9, 10, and 14 in view of Lansonic.

**Ground 10** – Obviousness of claim 13 under 35 U.S.C. § 103(a) in view of Lansonic.

**5. Ground Based on U.S. Patent No. 5,616,876 to Cluts**

**Ground 11** – Anticipation under 35 U.S.C. § 102(b) of claims 9, 10, and 14 based on U.S. Patent No. 5,616,876 to Cluts (“Cluts,” Ex. 1016).

Set forth below is a discussion of how the claims are unpatentable under the statutory grounds raised, including claim charts that specify where each element of a challenged claim is met by the prior art. 37 C.F.R. § 42.104(b)(4). The showing in these sections establishes a reasonable likelihood of prevailing as to each ground

of invalidity with respect to the challenged claims as to that ground. This showing is accompanied by the Declaration of Dr. V. Michael Bove, Jr. (Ex. 1002) as noted above.

**B. Ground 1 – Anticipation Of Claims 9, 10, And 14 By Berman**

Berman was filed on April 16, 1999, and thus is prior art under 35 U.S.C. § 102(e) based on the earliest possible effective filing date of the '952 patent, *i.e.*, November 8, 2000.

Berman is entitled “System for Playback of Network Audio Material on Demand.” The Berman system is illustrated in FIG. 1, reproduced below.

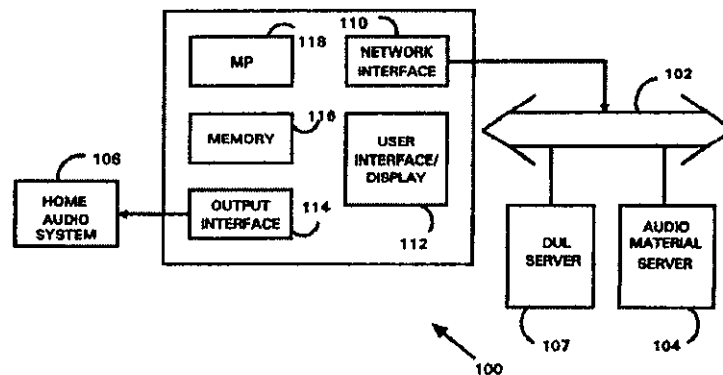
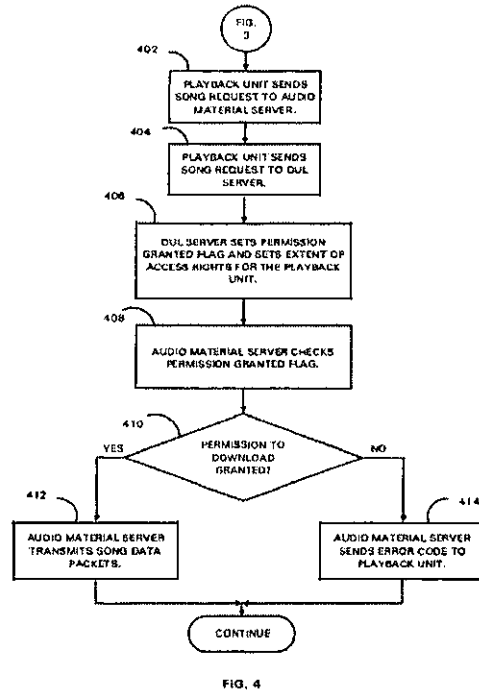
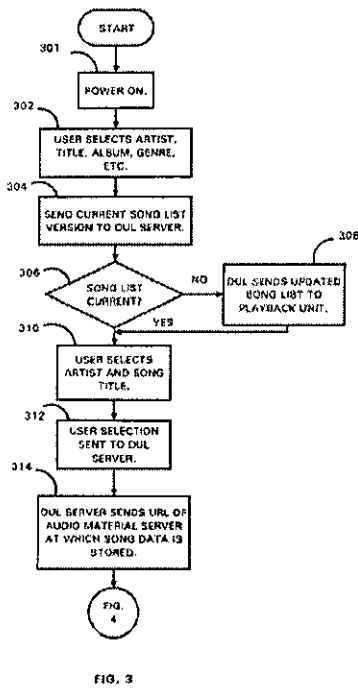


FIG. 1

As noted at 3:33-39, the system is directed to a playback apparatus that provides an interface to network audio files that are retrieved in real time in response to user selection. The playback unit 100 includes a network interface 110, and receives audio material from an audio material server and provides it to a conventional home audio system 106 for playback. (4:47-53.) An output interface

114 is provided to process audio material and provide it to a home audio system 106. (5:65-67.)

As discussed beginning at 6:64, the user selects a music category or type of song desired for playback from a list, which may include categories such as artist, song title, album, and musical genres. The process of selection of audio material to be played is described in connection with FIGS. 3 and 4, reproduced below.



In response to the user's initial selection, the current song list is first sent to the directory and user list (DUL) server 107. The server checks to see if the current song list is up to date and sends an updated song list back to the playback unit 100. The user then selects a song for playback. The playback unit 100

receives the URL of the song and sends a song request to the audio material server 104, and the audio material server transmits song data packets to the playback unit.

It is submitted that Berman discloses each element of claims 9, 10, and 14 of the '952 patent, under the Patent Owner's broad construction of the term "playlist assigned to the electronic device." According to the Patent Owner, this term encompasses a playlist that has been requested from the device without any actual selection of a device, *i.e.*, without any act of assigning to the device. Berman discloses receiving a playlist, receiving information enabling the device to obtain songs in the playlist, and obtaining the songs as claimed. Set forth below is a claim chart that specifies where each element of a challenged claim is met by Berman.

Claim	U.S. Patent No. 6,502,194 to Berman <i>et al.</i>
<p>9. A method comprising:  receiving, at an electronic device, a playlist assigned to the electronic device, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;</p>	<p>A playback unit 100 is an electronic device and is connected via a network 102 to an audio material server 104 and a directory and user list (DUL) server 107. <i>See, e.g.</i>, FIG. 1; 4:47-65.</p> <p>The playback unit 100 receives a song list from the DUL server 107. <i>See, e.g.</i>, FIG. 3, step 308 ("DUL SENDS UPDATED SONG LIST TO PLAYBACK UNIT."). The DUL server assigns the list to the playback unit by use of the user ID. <i>See, e.g.</i>, FIG. 8; 10:23-30 ("confirm that the updated song list information was sent to and received by the correct playback unit.").</p>

Claim	U.S. Patent No. 6,502,194 to Berman <i>et al.</i>
	<p>The songs are stored on the audio material server 104, <i>i.e.</i>, not on the playback unit 100. <i>See, e.g.</i>, 4:51-52 (“The playback unit receives audio material from an audio material server”). The playback unit includes buffer memory for holding song data. 6:8-13, 11:28-12:62. In addition, songs may be recorded if there is permission, and the device thus includes memory for storing songs. <i>See, e.g.</i>, 8:4-23, 13:65-14:2, 14:54-60; FIG. 13.</p>
<p>receiving, at the electronic device, information enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source; and</p>	<p>The playback unit 100 receives a uniform resource locator (URL) of the audio material server 104 at which the song data is stored, enabling the playback unit to obtain the song from the audio material server. <i>See, e.g.</i>, FIG. 3, step 314 (“DUL SERVER SENDS URL OF AUDIO MATERIAL SERVER AT WHICH SONG DATA IS STORED.”); 7:22-54.</p>
<p>obtaining the ones of the plurality of songs from the at least one remote source.</p>	<p>The playback unit 100 receives song data packets from the audio material server 104. <i>See, e.g.</i>, FIG. 4, step 412 (“AUDIO MATERIAL SERVER TRANSMITS SONG DATA PACKETS.”); 8:31-34 (“the audio material server transmits the audio material (comprising a sound file or streaming audio information) to the playback unit, where it is received by the network interface as described above”). Songs in the list are played sequentially in the normal mode. <i>See, e.g.</i>, 9:7-34. Songs are played via the buffer memory. 11:28-12:62.</p>
<p>10. The method of claim 9 wherein the electronic device is one of a plurality of associated electronic devices and the at least one remote source is at least one</p>	<p>The DUL server 107 associates the playback unit 100 with the audio material server 104 by authenticating the playback unit with a user identification code and password, and setting a permission granted flag that is</p>

Claim	U.S. Patent No. 6,502,194 to Berman <i>et al.</i>
<p>other of the plurality of associated electronic devices, and obtaining the ones of the plurality of songs comprises:</p>	<p>checked by the appropriate audio material server when the playback unit accesses the URL provided by the DUL server. <i>See, e.g.</i>, FIGS. 3 and 4; 7:55-66 (“When the playback unit sends the song request to the server whose URL it received from the DUL server, it also sends a user identification code (user ID) and encrypted password information to the DUL server. . . . If the user ID and password information is validated, then the DUL server sets a permission granted flag that is checked by the appropriate audio material server.”).</p>
<p>requesting the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and</p>	<p>The playback unit 100 requests the song from the audio material server 104. <i>See, e.g.</i>, FIG. 4, step 402 (“PLAYBACK UNIT SENDS SONG REQUEST TO AUDIO MATERIAL SERVER.”). The songs from a playlist are played sequentially. 9:7-10.</p>
<p>receiving the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices.</p>	<p>The playback unit 100 receives the requested song from the audio material server 104. <i>See, e.g.</i>, FIG. 4, step 412 (“AUDIO MATERIAL SERVER TRANSMITS SONG DATA PACKETS.”); 8:31-34 (“the audio material server transmits the audio material (comprising a sound file or streaming audio information) to the playback unit, where it is received by the network interface as described above”).</p>
<p>14. The method of claim 9 wherein the electronic device is one of a plurality of electronic devices associated with a personal audio network comprising the plurality of electronic devices and a personal audio network server, and</p>	<p>The DUL server 107 is a personal audio network server and associates the playback unit 100 with the audio material server 104 in a personal audio network by authenticating the playback unit with a user identification code and password, and setting a permission granted flag that is checked by the appropriate audio material server when the playback unit accesses the URL provided</p>

Claim	U.S. Patent No. 6,502,194 to Berman <i>et al.</i>
	by the DUL server. <i>See, e.g.</i> , FIGS. 3 and 4; 7:55-66 (“When the playback unit sends the song request to the server whose URL it received from the DUL server, it also sends a user identification code (user ID) and encrypted password information to the DUL server. . . . If the user ID and password information is validated, then the DUL server sets a permission granted flag that is checked by the appropriate audio material server.”).
receiving the playlist assigned to the electronic device comprises receiving the playlist from the personal audio network, wherein the personal audio network server enables a user to assign the playlist to the electronic device; and	When a user selects an artist, requesting that the song list of the artist be assigned to the playback unit 100, the playback unit 100 receives an updated song list from the DUL server 107, thus assigning the updated song list to the playback unit 100. <i>See, e.g.</i> , FIG. 3, step 308 (“DUL SENDS UPDATED SONG LIST TO PLAYBACK UNIT.”). By selection of a song list, the user causes the updated song list to be assigned by the DUL server to the playback unit.
receiving the information comprises receiving information from the personal audio network server enabling the electronic device to obtain the ones of the plurality of songs from the at least one remote source.	The playback unit 100 receives a uniform resource locator (URL) of the audio material server 104 at which the song data is stored, enabling the playback unit to obtain the song from the audio material server. <i>See, e.g.</i> , FIG. 3, step 314 (“DUL SERVER SENDS URL OF AUDIO MATERIAL SERVER AT WHICH SONG DATA IS STORED.”).

**C. Ground 2 – Obviousness Of Claim 13 In View Of Berman**

Claim 13 recites that the remote source is a “web site.” As set forth in the claim chart below, it would have been obvious to one of skill in the art that the

DUL server could be a website, as access to locations on the Internet is commonly accomplished via websites. (Bove Decl. ¶ 19.)

Claim	U.S. Patent No. 6,502,194 to Berman <i>et al.</i>
<p>13. The method of claim 9 wherein the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained, and obtaining the ones of the plurality of songs comprises: requesting the ones of the plurality of songs from the at least one web site; and receiving the ones of the plurality of songs from the at least one web site.</p>	<p>The playback unit 100 receives a uniform resource locator (URL) of the audio material server 104 at which the song data is stored, enabling the playback unit to obtain the song from the audio material server. <i>See, e.g.</i>, FIG. 3, step 314 (“DUL SERVER SENDS URL OF AUDIO MATERIAL SERVER AT WHICH SONG DATA IS STORED.”). A URL allows playback unit 100 to receive the audio material from a web server. In the case where the playlist has previously been played, the songs would have been previously obtained from the website. The preferred network is the Internet, in which servers could be associated with websites. <i>See, e.g.</i>, 13:21-27.</p>

**D. Ground 3 – Anticipation Of Claims 9, 10, 13, And 14 By Leeke**

Leeke was filed on November 24, 1998, and thus is prior art under 35 U.S.C. § 102(e) based on the earliest possible effective filing date of the '952 patent, *i.e.*, November 8, 2000.

Leeke is entitled “Content Player Method and Server with User Profile.”

The Leeke system is illustrated in FIG. 1, reproduced below.



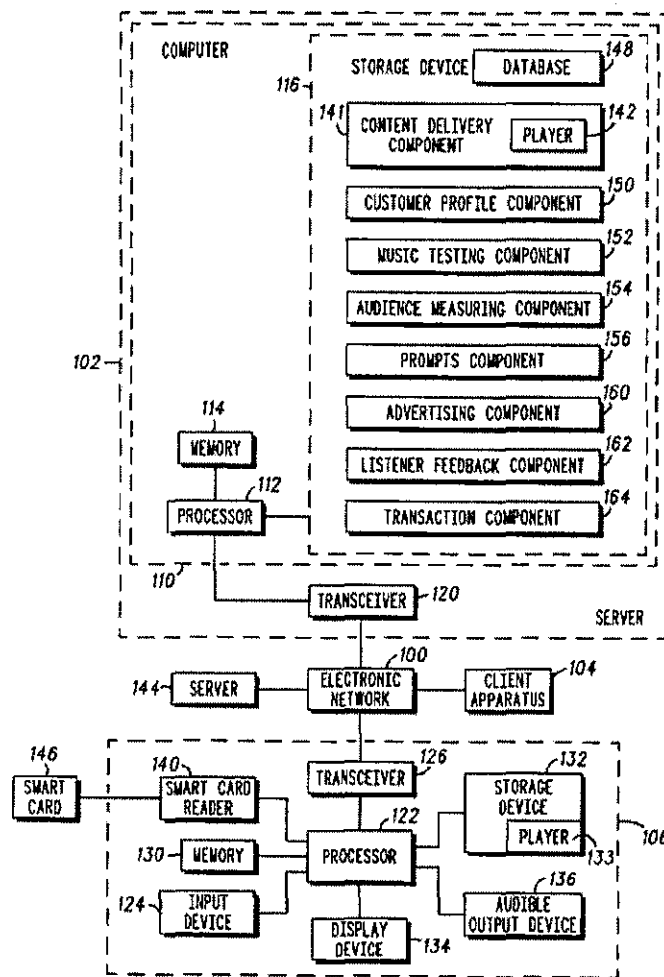


FIG. 1

As noted at 4:7-19, Leeke is directed to a system for providing audio content via an electronic network 100. The system includes a server 102 and a plurality of client apparatuses 104, one of which is illustrated in more detail at 106.

Using one of several different methods, a user of client apparatus 106 selects a playlist of songs available on server 102. For example, using the interface illustrated in FIG. 2, reproduced below, the user can select a preset 202. Presets

can be used to store access to a list of specific content, such as all songs by a particular artist, and are available across different client apparatuses. (9:61-10:14.)

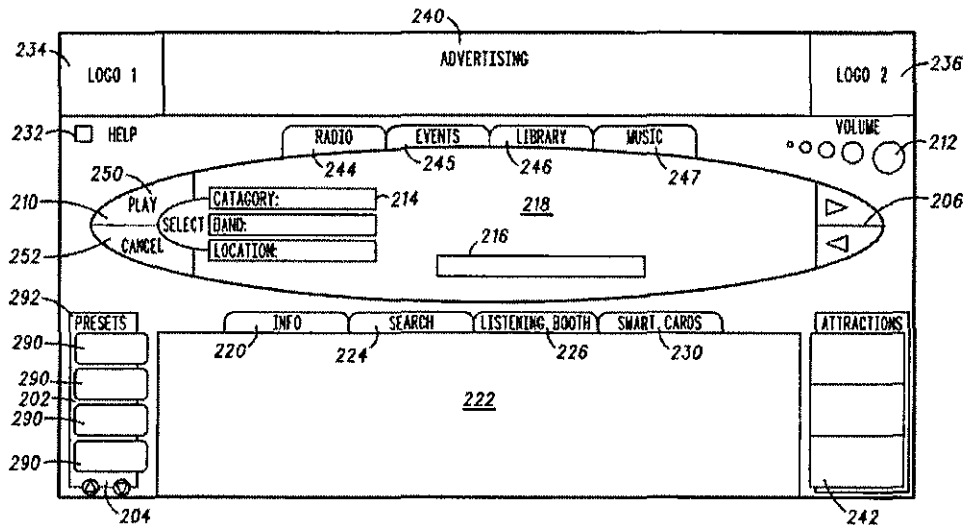


FIG. 2

As another example, using the interface illustrated in FIGS. 20 and 21, reproduced below, a user may also select from a playlist of songs using attribute selections 214 or track pick list 620. Upon selection of an attribute, a list of songs having the selected attribute is displayed. (19:48-20:16.) Track indicator 620 displays the current track and the number of tracks in the playlist. Clicking on track indicator 620 presents a pick list of tracks in the playlist. (20:43-49.)

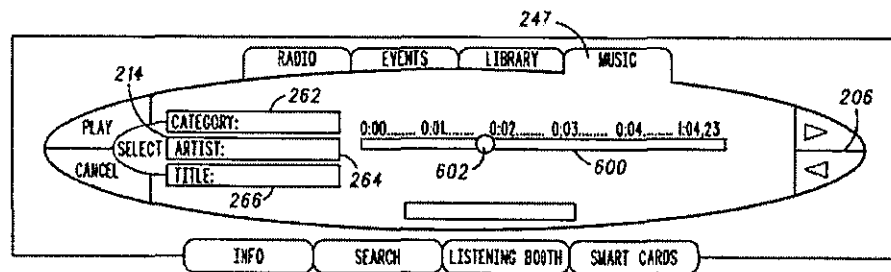


FIG. 20

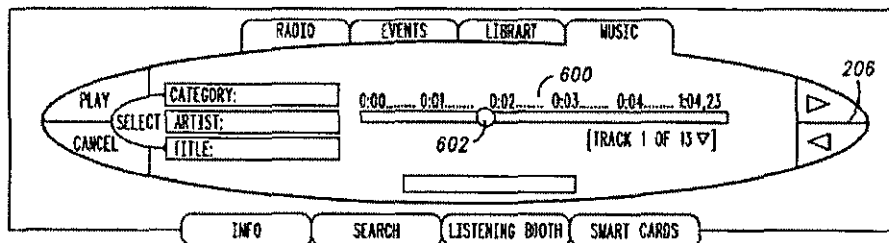


FIG. 21

Smart cards also facilitate access to specific titles as part of a playlist. In this case, the end user can specify and save a playlist of titles to the smart card. (20:35-37.)

Regardless of which method is used to receive a playlist of songs from server 102, upon selection of a song from the playlist, the client apparatus uses information in the playlist (*e.g.*, a URL) to obtain the selected song from server 102 or another remote server 144. (5:1-4.)

It is submitted that Leeke discloses each element of claims 9, 10, 13, and 14 of the '952 patent, under the Patent Owner's broad construction of the term "playlist assigned to the electronic device." According to the Patent Owner, this term encompasses a playlist that has been requested from the device without any actual selection of a device, *i.e.*, without any act of assigning to the device. Leeke discloses receiving a playlist, receiving information enabling the device to obtain songs in the playlist and obtaining the songs as claimed. Set forth below is a claim chart that specifies where each element of a challenged claim is met by Leeke.

Claim	U.S. Patent No. 6,587,127 to Leeke <i>et al.</i>
<p>9. A method comprising: receiving, at an electronic device, a playlist assigned to the electronic device, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;</p>	<p>The basic configuration is illustrated in FIG. 1 and described at 4:12-5:48. Client apparatus 106 is an electronic device and receives a playlist from server 102. The playlist can be stored on server 102, and in such a case the server 102 must send the playlist to client apparatus 106 for a user to select from the playlist. <i>See, e.g.</i>, 17:29-30 (“For example, the playlist information can be stored by the storage device 116 of the server 102”).</p> <p>Numerous different types of playlists are disclosed, including playlists, presets, and attribute fields (<i>e.g.</i>, category, artist, or album). <i>See, e.g.</i>, 19:59-20:22 (“The graphical user interface provides multiple ways to navigate to content in the music category. A first way includes using the selection attribute indicators 214 to select content having chosen attributes”), 20:23-29 (“A second way to navigate music content is to use a preset”); 10:5-10 (“Presets may be used to store access to specific content or titles, or may be used to specify sets of titles. For example, a first preset can specify a set of all stations that broadcast jazz, and a second preset can specify all recordings of a particular artist.”), 20:30-42 (“A third way to navigate to music content is to use a smart card (either physical or virtual). . . . Smart cards also facilitate access to specific titles as part of a playlist. In this case, the end user can specify and save a playlist of titles to the smart card.”); <i>see also</i> 23:47-24:2; FIGS. 2, 20, 21 and 33.</p>

Claim	U.S. Patent No. 6,587,127 to Leeke <i>et al.</i>
	<p>The songs identified in a playlist can be stored on servers, <i>i.e.</i>, not client apparatus 106. <i>See, e.g.</i>, 5:1-4.</p> <p>Client apparatus 106 can be a general purpose or network computer and includes a storage device 132 such as a hard drive to store data. <i>See, e.g.</i>, 4:21-49. Content can be purchased and delivered electronically, and the client apparatus thus includes storage for songs. <i>See, e.g.</i>, 33:10-12, 35:26-34, 40:19-25, 50:41-52.</p> <p>The playlist is assigned to client apparatus 106. The playlist information can be stored on the server and made available (<i>i.e.</i>, assigned) to the device with a particular virtual smart card. <i>See, e.g.</i>, 17:27-32 (“It is noted that the playlist information stored can be separate from a physical or a virtual smart card. For example, the playlist information can be stored by the storage device 116 of the server 102 or by the storage device 132 of the client apparatus 106.”), 5:21-24 (“The actual or virtual smart card can be used to separate access to content from the content itself.”).</p>
<p>receiving, at the electronic device, information enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source; and</p>	<p>The displayed playlist has information associated with it, such as URLs, that enable the player to obtain the songs when a playlist or song from a playlist is selected. <i>See, e.g.</i>, 19:59-20:49. Client apparatus 106 coordinates with server 102 to obtain streaming audio content from a remote source. Client apparatus 106 thus receives information from server 102 enabling client apparatus 106 to receive the streaming audio content. <i>See, e.g.</i>, 4:50-52, 5:33-35, 43:14-17 (“The media location</p>

Claim	U.S. Patent No. 6,587,127 to Leeke <i>et al.</i>
	can be in the form of an electronic address, such as a URL or a Uniform Resource Name (URN), for accessing the content via the electronic network 100.”).
obtaining the ones of the plurality of songs from the at least one remote source.	Client apparatus 106 obtains songs from a remote server. <i>See, e.g.</i> , FIG. 1; 4:7-8, 5:1-4 (“The player 142 accesses audio content either locally from the server 102 or remotely from a server 144, and communicates the audio content to the client apparatus 106 using streaming technology.”).
10. The method of claim 9 wherein the electronic device is one of a plurality of associated electronic devices and the at least one remote source is at least one other of the plurality of associated electronic devices, and obtaining the ones of the plurality of songs comprises:	The client apparatus 106 is associated with the server 102 by the customer profile component 150 which includes records of each end user. <i>See, e.g.</i> , 6:2-27. When a user signs in, the client apparatus is associated with the server 102.
requesting the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and	Songs are requested from the server 102 by interacting with the playlist as noted with regard to claim 9.
receiving the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices.	Songs from the server 102 are received at the client device 106. <i>See, e.g.</i> , 5:1-6.
13. The method of claim 9 wherein the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained, and obtaining the ones of the plurality of songs comprises: requesting the ones of the plurality of songs from	The server 102 can be accessible via a website, and songs previously listened to, <i>e.g.</i> , songs from a playlist, would have been previously obtained. The client device requests and receives songs. <i>See, e.g.</i> , 5:33-48 (“The player 142 can cooperate with a browser program and/or a streaming audio plug-in program executed

<b>Claim</b>	<b>U.S. Patent No. 6,587,127 to Leeke <i>et al.</i></b>
the at least one web site; and receiving the ones of the plurality of songs from the at least one web site.	by the client apparatus 106..."); 29:31-38 ("a Web site associated with the player ...").
14. The method of claim 9 wherein the electronic device is one of a plurality of electronic devices associated with a personal audio network comprising the plurality of electronic devices and a personal audio network server, and	A user may have plural client apparatuses 106, <i>e.g.</i> , a computer and a wireless device, which along with server 102 are associated with the user's personal audio network. Each client apparatus can access the same information from the server by use of a virtual smart card. <i>See, e.g.</i> , 4:21-24; 5:16-24 ("...The actual or virtual smart card can be used to separate access to content from the content itself. Further, the actual or physical smart card can act as a preference key to uniquely personalize a player for an individual in a consistent manner across all entry points or platforms. For a virtual smart card in this case, the client side provides a key to the server side of the preferences."), 23:60-65.
receiving the playlist assigned to the electronic device comprises receiving the playlist from the personal audio network, wherein the personal audio network server enables a user to assign the playlist to the electronic device; and	<i>See, e.g.</i> , 4:21-24; 5:16-24; 23:60-65. The server 102 enables a user to request a playlist from any of the devices by use of the virtual smart card in response to provision of a key from the device being used.
receiving the information comprises receiving information from the personal audio network server enabling the electronic device to obtain the ones of the plurality of songs from the at least one remote source.	<i>See, e.g.</i> , 4:21-24; 5:16-24; 23:60-65. Playlists can be accessed from different entry points, <i>i.e.</i> , different devices, and used to obtain songs from the server 102.

**E. Ground 4 – Obviousness Of Claims 9, 10, 13, And 14 In View Of Leeke**

To the extent that the claim term “assigned to” is construed to require specific selection of a device such that merely using a virtual smart card to access a playlist does not anticipate the claims, claims 9, 10, 13, and 14 would be obvious in view of Leeke. Leeke discloses at 20:35-42 that playlists can be transferred between an end user and another user and between plural access points of the end user. Such transfer of playlists renders it obvious to make an assignment of a playlist from a user’s device to another device by making a specific selection of where to transfer a playlist. (*See also* 10:11-14; Bove Decl. ¶¶ 20-21.)

**F. Ground 5 – Anticipation Of Claims 9, 10, And 14 By Wolff**

Wolff was filed on July 30, 2000, and thus is prior art under 35 U.S.C. § 102(e) based on the earliest possible effective filing date of the '952 patent, *i.e.*, November 8, 2000.

Wolff is entitled “Remote Console for Network Application Servers.” The Wolff system is illustrated in FIG. 1, reproduced below.



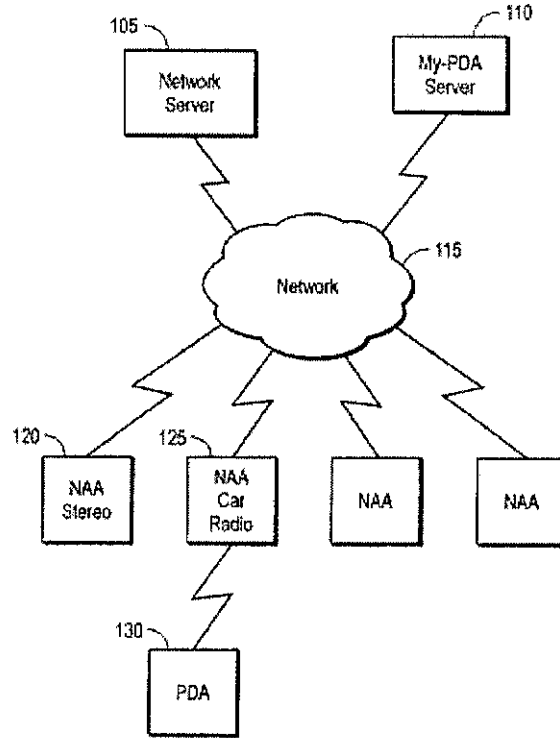


FIG. 1

The system includes a plurality of network access appliances (NAAs) that can retrieve media objects such as songs from a network. A network access appliance may have a local cache that can store media objects such as objects that a user has identified as favorites. A remote controller such as a PDA is provided to facilitate selection of objects. Objects may be identified by resource identifiers such as URLs. This general operation is discussed at 3:18-64.

The system includes a personal server (“My-PDA server”) 110. The personal server is described at 4:37-64 and is provided to maintain information stored on the remote controller. The remote controller is synchronized with the

personalized server, for example, through a docking cradle connected to the Internet.

The remote controller may be used to create “play lists,” as described at 8:7-34. When the remote controller is synchronized with the personalized server, the playlist is updated in the server. Periodically, the media objects indicated by the playlist can be accessed and cached by the appropriate network access appliance. This is done “by examining stored play lists.” Therefore, the NAA will receive the playlist from the personalized server, examine it and obtain media objects not already stored in its cache.

It is submitted that Wolff discloses each element of claims 9, 10, and 14 of the '952 patent, under the Patent Owner’s broad construction of the term “playlist assigned to the electronic device.” According to the Patent Owner, this term encompasses a playlist that has been requested from the device without any actual selection of a device, *i.e.*, without any act of assigning to the device. (*See Patent Owner ITC Claim Chart re Toshiba (Ex. 1011) at 4-5.*) Wolff discloses receiving a playlist, receiving information enabling the device to obtain songs in the playlist, and obtaining the songs as claimed. Set forth below is a claim chart that specifies where each element of a challenged claim is met by Wolff.

<b>Claim</b>	<b>U.S. Patent No. 7,472,353 to Wolff <i>et al.</i></b>
9. A method comprising: receiving, at an electronic device, a playlist assigned to the electronic	Wolff discloses a system including a PDA 130 that may be used to create

Claim	U.S. Patent No. 7,472,353 to Wolff <i>et al.</i>
device, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	playlists. The playlists may be uploaded to a personalized server 110. <i>See, e.g.</i> , FIG. 1, 4:37-64, 7:62-8:34. A network access appliance (NAA) is an electronic device such as a stereo that can play songs, and includes cache memory for storing media objects identified by resource identifiers such as URLs. <i>See, e.g.</i> , 3:18-60, 4:29-36. The NAA accesses the personalized server and receives playlists. <i>See, e.g.</i> , 8:31-33 (“When the NAA has cached the media objects (by examining stored play lists)...”). The playlists are assigned to each NAA to permit the NAA to receive the lists.
receiving, at the electronic device, information enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source; and	The songs in the playlist are associated with resource identifiers which enable the NAA to obtain them from servers. <i>See, e.g.</i> , 3:30-41, 4:29-36, 58-64, 8:16-33.
obtaining the ones of the plurality of songs from the at least one remote source.	During synchronization, the NAA will obtain and cache media objects identified in the playlists. 8:23-33 (“the indicated media objects may eventually be accessed and cached by the appropriate NAA. . . . When the NAA has cached media objects (by examining stored play lists) the user will not have to wait for any downloads from the network server.”).
10. The method of claim 9 wherein the electronic device is one of a plurality of associated electronic devices and the at least one remote source is at least one other of the plurality of associated electronic devices, and obtaining the ones of the plurality of songs comprises:	An NAA is one of a plurality of associated electronic devices and the personalized server is another. The personalized server can keep copies of media objects corresponding to media objects and therefore can be a remote source. <i>See, e.g.</i> , 4:51-53.

Claim	U.S. Patent No. 7,472,353 to Wolff <i>et al.</i>
requesting the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and	The NAA examines playlists and requests songs that are not already in cache. The request can relate to media objects stored on the personalized server. <i>See, e.g.</i> , 4:51-53, 8:23-26.
receiving the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices.	The NAA receives songs from the personalized server. <i>See, e.g.</i> , 8:23-26.
14. The method of claim 9 wherein the electronic device is one of a plurality of electronic devices associated with a personal audio network comprising the plurality of electronic devices and a personal audio network server, and	Plural NAA devices can be associated with the personalized server, as shown in FIG. 2 and discussed at 4:65-5:33. NAA devices 120 and 128 are electronic devices and personalized server 110 is a personal audio network server.
receiving the playlist assigned to the electronic device comprises receiving the playlist from the personal audio network, wherein the personal audio network server enables a user to assign the playlist to the electronic device; and	<i>See</i> claim 9. The playlist is received from the personalized server 110, which is part of the personal audio network. The server 110 enables the user to assign the playlist to the NAA 128, <i>e.g.</i> , by selection using the remote controller 130. <i>See, e.g.</i> , 5:22-33.
receiving the information comprises receiving information from the personal audio network server enabling the electronic device to obtain the ones of the plurality of songs from the at least one remote source.	Playlists with URLs are received at the NAA from the server 110 and enable the NAA to obtain songs from the server. <i>See, e.g.</i> , 8:22-33.

**G. Ground 6 – Obviousness Of Claims 9, 10, And 14 In View Of Wolff**

In the event that the claim term “assigned to” is construed to require selection of a particular NAA rather than making playlists available to all NAAs,

claims 9, 10, and 14 would be obvious in view of Wolff. The selection of a specific NAA would have been obvious to a person of ordinary skill in the art, as it would have been obvious that a user may desire and therefore specify that particular playlists be available at particular devices depending upon the type of music desired to be listened to at each device. This is illustrated at 8:59-63, which indicates that playlists can be sent to another user. When such user receives the playlist, it would synchronize with the personalized server to obtain the songs, as described at 8:23-33. (Bove Decl. ¶¶ 22-23.)

#### **H. Ground 7 – Obviousness Of Claim 13 In View Of Wolff**

Claim 13 recites that the remote source is a website from which songs had previously been obtained. As discussed in the claim chart below, the personalized server may be accessed through the Internet. It would have been obvious to one of skill in the art that the personalized server could be a website, as access to locations on the Internet is commonly accomplished via websites. It also would have been obvious to one of skill in the art that the songs could be obtained from the website more than once (*i.e.*, have been previously obtained). (Bove Decl. ¶ 24.)

If the claim term “assigned to” is construed to require selection of a specific NAA, claim 13 would also be obvious in view of Wolff for the reasons discussed above in connection with claim 9.

Claim	U.S. Patent No. 7,472,353 to Wolff <i>et al.</i>
13. The method of claim 9 wherein the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained, and obtaining the ones of the plurality of songs comprises: requesting the ones of the plurality of songs from the at least one web site; and receiving the ones of the plurality of songs from the at least one web site.	Personalized server 110 is accessed through the network 115, and the network 115 may be the Internet. <i>See, e.g.</i> , FIG. 1; 3:56-60.

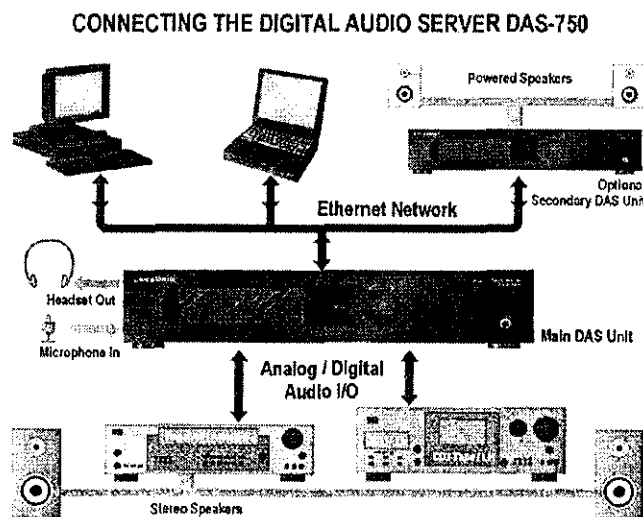
**I. Ground 8 – Anticipation Of Claims 9, 10, And 14 By Lansonic**

The Lansonic reference relates to a product called the Lansonic Digital Audio Server DAS-750. The reference, which is attached as Ex. 1015, is comprised of web pages that were posted on Lansonic’s website at least by September 18, 2000. The webpages available on Lansonic’s website in 2000 were accessed using the Internet Archive Wayback Machine, which “is a service that allows people to visit archived versions of Web sites.” *See Frequently Asked Questions*, INTERNET ARCHIVE, <http://archive.org/about/faqs.php> (last visited August 26, 2013). The webpages included were accessed by clicking an option in the navigation menu on the left side of the Lansonic home page, as seen on page 1 of Ex. 1015.

The Lansonic webpages, which were available at least by September 18, 2000, collectively constitute a single reference publication and thus is prior art under 35 U.S.C. § 102(a) based on the earliest possible effective filing date of the

'952 patent, *i.e.*, November 8, 2000. Alternatively, if the Lansonic webpages do not constitute one reference, each qualifies as an individual reference, and, as discussed further below, the claims of the '952 patent would have been obvious under 35 U.S.C. § 103 in view of the Lansonic webpages.

The Lansonic DAS-750 is a digital audio server that allows the user to playback audio available either locally or through the network. The system is illustrated at Ex. 1015 at 4.



The DAS-750 supports “a host of playlist capabilities.” (See Ex. 1015 at 3.) One of these capabilities allows the user to create a playlist of songs on a PC and transfer (*i.e.*, assign) the playlist to a networked DAS-750. (See Ex. 1015 at 17.) Some of the songs on the playlist may be stored on other devices, as the DAS-750 can be setup to play songs stored on PCs and other DAS-750 devices. (See Ex. 1015 at 3 and Ex. 1015 at 9.) To play the playlist, the user selects the playlist from

a menu, as seen on the display at Ex. 1015 at 7-8. If the song to be played is not stored locally, the device requests the song from the remote source, and it is transferred across the network to the device. (Ex. 1015 at 2-3.) In order to play the remotely stored songs, the playlist necessarily has information enabling the device to obtain the songs from the remote source. (Bove Decl. ¶ 26.)

It is submitted that Lansononic discloses each element of claims 9, 10, and 14 of the '952 patent. Lansononic discloses receiving a playlist, receiving information enabling the device to obtain songs in the playlist, and obtaining the songs as claimed. Set forth below is a claim chart that specifies where each element of a challenged claim is met by Lansononic.


Claim	Lansononic DAS-750
9. A method comprising:	
[a] <sup>1</sup> receiving, at an electronic device, a playlist assigned to the electronic device, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	A user of the Lansononic DAS-750, an electronic device, can assign and save a playlist identifying a plurality of songs to the DAS-750 using a networked computer. That is, the DAS-750 receives the playlist from the computer. <i>See, e.g.,</i> Manual Excerpts (Ex. 1015 at 17) <sup>2</sup> (“Save Playlist

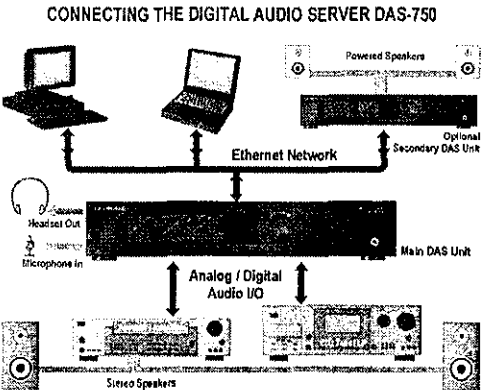
<sup>1</sup> For ease of reference in other claims, bracketed limitation references are added.

<sup>2</sup> The Lansononic reference (Ex. 1015) consists of pages from the Lansononic website. Ex. 1015 is marked with Bates numbers identifying each page. The citations in this claim chart identify both the page heading and the Bates-numbered page(s) of Ex. 1015.



Claim	Lansonic DAS-750
	<p>to the DAS Using the PC”); Manual Excerpts (Ex. 1015 at 15) (“The Lansonic DAS works with playlists (lists of one or more songs) . . .”).</p> <p>Songs identified in the playlist can be stored on other networked devices, <i>i.e.</i>, not stored on the DAS-750, although the device may have memory for storing songs. For examples, see the following:</p> <p>Product (Ex. 1015 at 3) (“[T]he DAS unit can be setup to see and play any shared music file stored on the PC. In fact there’s no need for copying between drives or keeping multiple copies on different machines -- the network connectivity allows any machine (DAS or PC) to access all the music (or other data) regardless of which machine its actually stored on!”);</p> <p>FAQ (Ex. 1015 at 9) (“Similarly music stored on a networked PC can be played on any DAS unit connected to the network.”);</p> <p>Configuration (Ex. 1015 at 2) (“The diskless unit is ideal as an additional DAS unit in a multi-room system, where the music is stored in another DAS unit (or PC) with a hard drive and then accessed and played across the LAN.”);</p> <p>Photos (Ex. 1015 at 7-8) showing “playlists” on display.</p>

Claim	Lansonic DAS-750
	
<p>[b] receiving, at the electronic device, information enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source; and</p>	<p>The DAS-750 can play songs stored on other networked devices by selecting a playlist. <i>See</i> above. In order to play the remotely stored songs, the playlist necessarily has information enabling the device to obtain the songs from the remote source.</p>
<p>[c] obtaining the ones of the plurality of songs from the at least one remote source.</p>	<p>The Lansonic DAS-750 can play songs stored on other networked devices. <i>See</i> above. To do so, the remotely stored songs are accessed (<i>i.e.</i>, requested) then transferred across the LAN (<i>i.e.</i>, obtained from the remote source). <i>See, e.g.</i>, Configuration (Ex. 1015 at 2) (“The diskless unit is ideal as an additional DAS unit in a multi-room system, where the music is stored in another DAS unit (or PC) with a hard drive and then accessed and played across the LAN.”).</p>
<p>10[a]. The method of claim 9 wherein the electronic device is one of a plurality of associated electronic devices and the at least one remote source is at least one other of the plurality of associated electronic devices, and obtaining the ones of the plurality of songs comprises:</p>	<p>The Lansonic DAS-750 can be connected to a plurality of associated devices to form an “Audio Neighborhood,” and the associated devices can serve as a remote source. <i>See, e.g.</i>, Product (Ex. 1015 at 3) (“The DAS-750 features a built-in Ethernet interface to network digital audio through a Local Area Network (LAN). The result is that the DAS unit bridges the gap between a traditional audio system and a home or office LAN. Stereo components, such as CD players, tape recorders, and most others can be connected to the network through the DAS</p>

Claim	Lansonic DAS-750
	<p>unit and form part of an Audio Neighborhood™ in much the same way that computers are regularly connected into a ‘Network Neighborhood’. Using this feature, two or more DAS units, in different rooms or offices, can be connected and controlled across a LAN to allow audio equipment in one room (<i>i.e.</i>, a CD player) to be played out through the DAS unit in the other room.”); Product (Ex. 1015 at 3) (“Simultaneously, a second DAS unit in another room (or alternately a Windows 95/98/NT/2000 PC) can access and play a different song from the same music collection stored on the first DAS unit.”); figure from product page (Ex. 1015 at 4).</p> 
[b] requesting the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and	See claim 9[c].
[c] receiving the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices.	See claim 9[c].
14. The method of claim 9 wherein the electronic device is one of a	As discussed in claim 9, the Lansonic DAS-750 can receive a playlist from a

Claim	Lansonic DAS-750
plurality of electronic devices associated with a personal audio network comprising the plurality of electronic devices and a personal audio network server, and	networked computer. <i>See</i> claim 9[a]. The networked computer is part of the “Audio Neighborhood” discussed in claim 10. <i>See</i> claim 10[a]. In this system, the networked computer constitutes a personal audio network server.
receiving the playlist assigned to the electronic device comprises receiving the playlist from the personal audio network, wherein the personal audio network server enables a user to assign the playlist to the electronic device; and	<i>See</i> claim 9[a].
receiving the information comprises receiving information from the personal audio network server enabling the electronic device to obtain the ones of the plurality of songs from the at least one remote source.	<i>See</i> claim 9[b].

**J. Ground 9 – Obviousness Of Claims 9, 10, And 14 In View Of Lansonic**

As discussed above, it is submitted that the Lansonic webpages constitute a single reference and is thus prior art under 35 U.S.C. § 102(a). However, if the Lansonic webpages do not constitute a single reference, each webpage constitutes a separate reference. Under that scenario, claims 9, 10, and 14 of the '952 patent would have been obvious to a person of ordinary skill in the art in view of the combined disclosures of the Lansonic webpages. It would have been obvious to a person of ordinary skill in the art to combine the disclosed features into a single

device, as a person of ordinary skill would have instantly recognized that the webpages were, in fact, describing a single device. (Bove Decl. ¶ 25.)

**K. Ground 10 – Obviousness Of Claim 13 In View Of Lansonie**

Claim 13 recites that the remote source is a website from which songs had previously been obtained. As set forth in the claim chart below, the Lansonie DAS-750 can obtain songs from websites, and it would have been obvious to one of skill in the art that songs that were legally downloaded previously could be downloaded again from the same website if for any reason they were not still stored locally. (Bove Decl. ¶ 27.)

<b>Claim</b>	<b>Lansonie DAS-750</b>
<p>13. The method of claim 9 wherein the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained, and obtaining the ones of the plurality of songs comprises: requesting the ones of the plurality of songs from the at least one web site; and receiving the ones of the plurality of songs from the at least one web site.</p>	<p>The Lansonie DAS-750 can obtain songs from a website. <i>See, e.g.</i>, Product (Ex. 1015 at 3) (“Through an array of popular websites, users can enjoy thousands of songs which can be legally downloaded and then played in virtually any DAS equipped room or office.”); Product (Ex. 1015 at 3) (“In addition the DAS-750 is designed to both transmit or receive streaming audio, so it is inherently Internet ready. Any DAS unit can be set for reception of streaming MP3 audio from an array of Internet radio sites from around the world.”).</p>

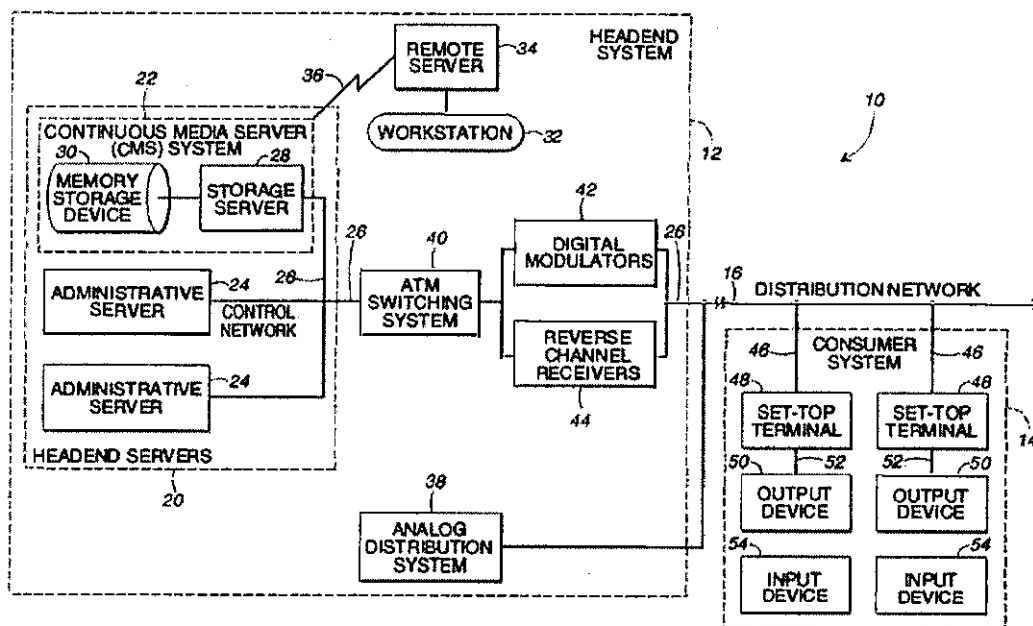
**L. Ground 11 – Anticipation Of Claims 9, 10, And 14 By Cluts**

Cluts issued on April 1, 1997, and thus qualifies as prior art under 35 U.S.C.

§ 102(b) based on the earliest effective filing date of the '952 patent, *i.e.*,

November 8, 2000.

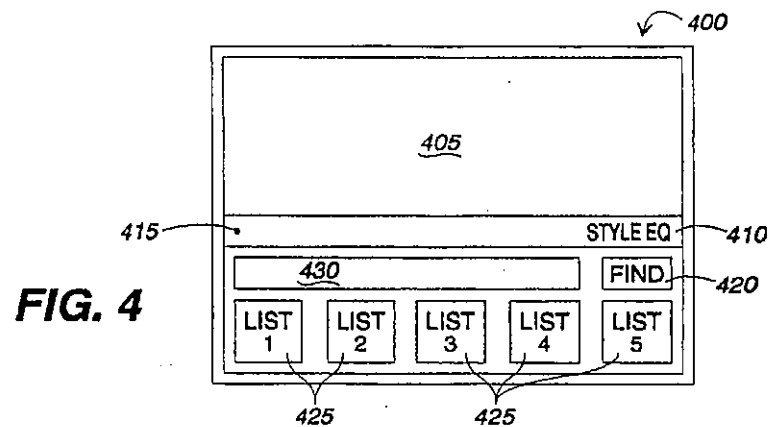
Cluts is entitled “System and Methods for Selecting Music on the Basis of Subjective Content.” The basic structure of the Cluts system is illustrated in FIG. 1, reproduced below.



**FIG. 1**

As noted at 6:20-7:5, a headend system 12 and a consumer system 14 are connected in a distribution network 16. The continuous media server (CMS) system 22 in headend system 12 stores digitized data, which is requested by and transmitted to the set-top terminal 48 in consumer system 14.

The set-top terminal 48 may operate in an active mode in which programming information of an audio on demand service is requested from the headend system 12. The headend system 12 responds by retrieving the selected programming information from the CMS system 22 and transmitting the selected programming information via the distribution network 16. (10:62-11:8.) In this way, the audio on-demand service allows a user to select a playlist for playback on the set-top terminal 48, and the songs identified in the playlist are transmitted to the set-top terminal. (11:38-41.) A playlist can be selected by interacting with a display screen of the user device, such as shown in FIG. 4. Individual songs in a playlist can be displayed as shown in FIG. 6



It is submitted that Cluts discloses each element of claims 9, 10, and 14 of the '952 patent. Cluts discloses receiving a playlist, receiving information enabling the device to obtain songs in the playlist, and obtaining the songs as claimed. Set

forth below is a claim chart that specifies where each element of a challenged claim is met by Cluts.

Claim	U.S. Patent No. 5,616,876 to Cluts
<p>9. A method comprising: receiving, at an electronic device, a playlist assigned to the electronic device, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;</p>	<p>A consumer system 14 including set-top terminal 48 receives programming information, such as a playlist of songs. The set-top terminal is an electronic device. The songs may be stored on a continuous media server (CMS) system 22, <i>i.e.</i>, not on the set-top terminal. <i>See, e.g.</i>, FIG. 1; 6:66-7:5 (“The CMS system 22 includes one or more storage servers 28, which operate to retrieve and to transmit the digitized data as required by clients of the CMS system, <i>i.e.</i>, the equipment of the consumer system 14. The digitized data, which typically comprises programming information, is maintained on one or more memory storage devices 30 connected to the storage servers 28.”), 11:38-41 (“In addition, the preferred audio on demand system also provides a variety of ancillary features. These features allow a subscriber to find a specific song by artist and title or select a playlist, which is a collection of songs.”), 12:55-59 (“various types of playlists may be provided by the service provider or other publishers.”). A playlist is “assigned to” the terminal 48 in response to selection of the playlist at the terminal, if “assigned to” is interpreted broadly. Songs in a playlist can be displayed to enable song selection. <i>See, e.g.</i>, FIGS. 5-6, 13:17-62.</p>
<p>receiving, at the electronic device, information enabling the electronic device to obtain the ones of the</p>	<p>The set-top terminal 48, as part of the consumer system 14, receives programming information that enables a</p>



Claim	U.S. Patent No. 5,616,876 to Cluts
<p>plurality of songs from at least one remote source; and</p>	<p>user to select a song from a playlist, both of which are obtained from the CMS system 22, which is a remote source. <i>See, e.g.</i>, FIG. 1; 6:66-7:5 (“The CMS system 22 includes one or more storage servers 28, which operate to retrieve and to transmit the digitized data as required by clients of the CMS system, <i>i.e.</i>, the equipment of the consumer system 14. The digitized data, which typically comprises programming information, is maintained on one or more memory storage devices 30 connected to the storage servers 28.”), 11:38-41 (“In addition, the preferred audio on demand system also provides a variety of ancillary features. These features allow a subscriber to find a specific song by artist and title or select a playlist, which is a collection of songs.”). Songs in a playlist can be displayed to enable song selection. Therefore, information is received at the device to enable the device to obtain songs from the remote source in response to such selection. <i>See, e.g.</i>, FIGS. 5-6, 12:24-13:62 (“a playlist is a collection of songs. When a playlist is selected, the audio on demand system begins to play the first song in the playlist . . .”), 15:14-25 (“A playlist is created by creating a database that includes the song ID numbers of the songs that are included in the playlist.”).</p>
<p>obtaining the ones of the plurality of songs from the at least one remote source.</p>	<p>A user may select a song from a playlist for playback. The songs are obtained from the CMS system 22, a remote source. <i>See, e.g.</i>, FIG. 1; 6:66-7:5 (“The CMS system 22 includes one or more storage servers 28, which operate to retrieve and to transmit the digitized data as required by clients of the CMS system, <i>i.e.</i>, the equipment of the</p>

Claim	U.S. Patent No. 5,616,876 to Cluts
	<p>consumer system 14. The digitized data, which typically comprises programming information, is maintained on one or more memory storage devices 30 connected to the storage servers 28.”), 11:38-51 (“In addition, the preferred audio on demand system also provides a variety of ancillary features. These features allow a subscriber to find a specific song by artist and title or select a playlist, which is a collection of songs . . .”), 12:24-56; 13:38-43 (“a playlist is a collection of songs. When a playlist is selected, the audio on demand system begins to play the first song in the playlist.”).</p> <p><i>See also</i> 10:62-11:8 (“In the event that a user tunes to an interactive channel (such as the audio on demand service), the set-top terminal 48 changes modes and enters the active mode. In the active mode, the set-top terminal 48 communicates with the headend system 12 to process the instructions transmitted by the remote control unit. For example, the set-top terminal 48 responds to a command requesting programming information by forwarding this instruction to the headend system 12 via the drop cable 46 and the distribution network 16. The headend system 12 responds by retrieving selected programming information from the CMS system 22 and transmitting the selected programming information via the return path provided by the distribution network 16 and the drop cable 46.”).</p>
10. The method of claim 9 wherein the electronic device is one of a	The set-top terminal 48 of consumer system 14 and the CMS system 22 are

Claim	U.S. Patent No. 5,616,876 to Cluts
<p>plurality of associated electronic devices and the at least one remote source is at least one other of the plurality of associated electronic devices, and obtaining the ones of the plurality of songs comprises:</p>	<p>associated electronic devices in the distribution network 16. <i>See, e.g.</i>, FIG. 1; 6:21-24 (“Referring to FIG. 1, an interactive network system 10 includes a headend system 12 for delivering programming information to and receiving instructions from a consumer system 14 via a “two-way” distribution network 16.”), 6:39-41 (“The headend system 12 can include a set of headend servers 20, including a continuous media server (CMS) system 22”).</p>
<p>requesting the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and</p>	<p>When a user selects songs for playback, the set-top terminal 48 requests the songs from the CMS system 22. <i>See, e.g.</i>, 10:62-11:8 (“In the event that a user tunes to an interactive channel (such as the audio on demand service), the set-top terminal 48 changes modes and enters the active mode. In the active mode, the set-top terminal 48 communicates with the headend system 12 to process the instructions transmitted by the remote control unit. For example, the set-top terminal 48 responds to a command requesting programming information by forwarding this instruction to the headend system 12 via the drop cable 46 and the distribution network 16. The headend system 12 responds by retrieving selected programming information from the CMS system 22 and transmitting the selected programming information via the return path provided by the distribution network 16 and the drop cable 46.”).</p>
<p>receiving the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices.</p>	<p>The selected songs are then received by the set-top terminal 48 from the CMS system 22. <i>See, e.g.</i>, 10:62-11:8 (“In the event that a user tunes to an interactive channel (such as the audio on demand service), the set-top</p>

Claim	U.S. Patent No. 5,616,876 to Cluts
	<p>terminal 48 changes modes and enters the active mode. In the active mode, the set-top terminal 48 communicates with the headend system 12 to process the instructions transmitted by the remote control unit. For example, the set-top terminal 48 responds to a command requesting programming information by forwarding this instruction to the headend system 12 via the drop cable 46 and the distribution network 16. The headend system 12 responds by retrieving selected programming information from the CMS system 22 and transmitting the selected programming information via the return path provided by the distribution network 16 and the drop cable 46.”), 12:24-56, 13:38-43 (“a playlist is a collection of songs. When a playlist is selected, the audio on demand system begins to play the first song in the playlist.”).</p>
<p>14. The method of claim 9 wherein the electronic device is one of a plurality of electronic devices associated with a personal audio network comprising the plurality of electronic devices and a personal audio network server, and</p>	<p>The consumer system 14 and the CMS system 22 are associated electronic devices in the personal audio network, the distribution network 16, which includes the personal audio network server, and the headend system 12 including the CMS system 22. <i>See, e.g.</i>, FIG. 1; 6:21-24 (“Referring to FIG. 1, an interactive network system 10 includes a headend system 12 for delivering programming information to and receiving instructions from a computer system 14 via a “two-way” distribution network 16.”), 6:39-41 (“The headend system 12 can include a set of headend servers 20, including a continuous media server (CMS) system 22”).</p>

Claim	U.S. Patent No. 5,616,876 to Cluts
<p>receiving the playlist assigned to the electronic device comprises receiving the playlist from the personal audio network, wherein the personal audio network server enables a user to assign the playlist to the electronic device; and</p>	<p>The consumer system 14 receives programming information, such as a playlist of songs, from the personal audio network, the distribution network 16, including the CMS system 22. The user may select the playlist for playback, thus assigning the playlist to the set-top receiver of the consumer system 14. <i>See, e.g.</i>, FIG. 1; 6:66-7:5 (“The CMS system 22 includes one or more storage servers 28, which operate to retrieve and to transmit the digitized data as required by clients of the CMS system, <i>i.e.</i>, the equipment of the consumer system 14. The digitized data, which typically comprises programming information, is maintained on one or more memory storage devices 30 connected to the storage servers 28.”), 11:38-41 (“In addition, the preferred audio on demand system also provides a variety of ancillary features. These features allow a subscriber to find a specific song by artist and title or select a playlist, which is a collection of songs.”), 10:62-11:8 (“In the event that a user tunes to an interactive channel (such as the audio on demand service), the set-top terminal 48 changes modes and enters the active mode. In the active mode, the set-top terminal 48 communicates with the headend system 12 to process the instructions transmitted by the remote control unit. For example, the set-top terminal 48 responds to a command requesting programming information by forwarding this instruction to the headend system 12 via the drop cable 46 and the distribution network 16. The headend system 12 responds by retrieving selected programming information from the CMS</p>

Claim	U.S. Patent No. 5,616,876 to Cluts
	<p>system 22 and transmitting the selected programming information via the return path provided by the distribution network 16 and the drop cable 46.”).</p> <p>The user can also interact with the system with a personal computer to create playlists that can be sent to the set top unit. The personal computer is another associated device. <i>See, e.g.</i>, 12:54-65.</p>
<p>receiving the information comprises receiving information from the personal audio network server enabling the electronic device to obtain the ones of the plurality of songs from the at least one remote source.</p>	<p>The set-top terminal 48, as part of the consumer system 14, receives programming information that enables a user to select a song from a playlist, both of which are obtained from the CMS system 22, a remote source in the distribution network 16. <i>See, e.g.</i>, FIG. 1; 6:66-7:5 (“The CMS system 22 includes one or more storage servers 28, which operate to retrieve and to transmit the digitized data as required by clients of the CMS system, <i>i.e.</i>, the equipment of the consumer system 14. The digitized data, which typically comprises programming information, is maintained on one or more memory storage devices 30 connected to the storage servers 28.”), 11:38-41 (“In addition, the preferred audio on demand system also provides a variety of ancillary features. These features allow a subscriber to find a specific song by artist and title or select a playlist, which is a collection of songs.”).</p>

## VIII. CONCLUSION

For the reasons detailed above, there is a reasonable likelihood that Petitioner will prevail as to each of claims 9, 10, 13, and 14 of the '952 patent. Accordingly, *inter partes* review of claims 9, 10, 13, and 14 of the '952 patent is respectfully requested.

The USPTO is authorized to charge any required fees, including the fee as set forth in 37 C.F.R. § 42.15(a) and any excess claim fees, to Deposit Account No. 03-1952 referencing Docket No. 393032805700.

Dated: September 18, 2013

Respectfully submitted,

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**Certificate of Service (37 C.F.R. § 42.6(e)(4))**

I hereby certify that the attached Petition for *Inter Partes* Review and supporting materials were served as of the below date by U.S. Express Mail on the Patent Owner at the correspondence address indicated for U.S. Patent

No. 8,045,952:

Concert Technology Corporation  
5400 Trinity Road, Suite 303  
Raleigh, NC 27607

Dated: September 18, 2013

/Mehran Arjomand/  
Mehran Arjomand  
MORRISON & FOERSTER LLP  
707 Wilshire Blvd, Suite 6000  
Los Angeles, CA 90017-3543



# **EXHIBIT 4**

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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YAMAHA CORPORATION OF AMERICA  
Petitioner

v.

BLACK HILLS MEDIA, LLC  
Patent Owner

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Case IPR2013-00593  
Patent 8,045,952 B2

Before BRIAN J. McNAMARA, STACEY G. WHITE, and  
PETER P. CHEN, *Administrative Patent Judges*.

WHITE, *Administrative Patent Judge*.

DECISION  
Institution of *Inter Partes* Review  
37 C.F.R. § 42.108



I. INTRODUCTION

A. Background

Yamaha Corporation of America (“Petitioner”) filed a petition to institute an *inter partes* review (“Petition”) of claims 9, 10, 13, and 14 (“challenged claims”) of U.S. Patent No. 8,045,952 B2 (Ex. 1001, the “952 Patent”) pursuant to 35 U.S.C. §§ 311-319. Paper 1 (“Pet.”). Black Hills Media, LLC (“Patent Owner”) filed a preliminary response. Paper 14 (“Prelim. Resp.”). We have jurisdiction under 35 U.S.C. § 314.

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides as follows:

**THRESHOLD** – The Director may not authorize an *inter partes* review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

Petitioner contends the challenged claims are unpatentable under 35 U.S.C. §§ 102 and 103 on the following specific grounds (Pet. 13-14):

Reference	Basis	Claims challenged
Berman <sup>1</sup>	§102	9, 10, 14
Berman	§103	13
Leeke <sup>2</sup>	§102 §103	9, 10, 13, 14

<sup>1</sup> U.S. Patent No. 6,502,194 B1, Dec. 31, 2002, filed Apr. 16, 1999 (Ex. 1012).

<sup>2</sup> U.S. Patent No. 6,587,127 B1, Jul. 1, 2003, filed Nov. 24, 1998 (Ex. 1013).

Reference	Basis	Claims challenged
Wolff <sup>3</sup>	§102	9, 10, 14
Wolff	§103	9, 10, 13, 14
Lansonic DAS-750 <sup>4</sup>	§102	9, 10, 14
Lansonic DAS-750	§103	9, 10, 13, 14
Cluts <sup>5</sup>	§102	9, 10, 14

For the reasons described below, we determine that the present record demonstrates a reasonable likelihood that Petitioner will prevail in establishing the unpatentability of all the challenged claims. Accordingly, we grant the Petition for *inter partes* review of the '952 Patent as to claims 9, 10, 13, and 14 based on the authorized grounds, as discussed below.

*B. Related Matters*

Petitioner indicates that the '952 Patent is at issue in *Black Hills Media, LLC v. Yamaha Corp. of America*, No. 2:13-cv-006054 (C.D. Cal.) Pet. 2-4. In addition, Patent Owner has pending cases concerning the '952 Patent in the United States District Court for the District of Delaware involving Sharp (1:13-cv-00804), Toshiba (1:13-cv-00805), Panasonic (1:13-cv-00806) and LG Electronics Inc. (1:13-cv-00803-RGA); a case in the Eastern District of Texas against Samsung (2:13-cv-00379); cases in the Central District of California involving Pioneer (2:13-cv-05980), Logitech International (2:13-cv-06055), and Sonos, Inc. (2:13-cv-06062); and an

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<sup>3</sup> U.S. Patent No. 7,472,353 B1, Dec. 30, 2008, filed July 31, 2000 (Ex. 1014).

<sup>4</sup> Web pages describing the Lansonic DAS-750 (Ex. 1015).

<sup>5</sup> U.S. Patent No. 5,616,876, Apr. 1, 1997, filed Mar. 28, 2000 (Ex. 1016).

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investigation before the U.S. International Trade Commission, *Certain Digital Media Devices, Including Televisions, Blu-Ray Disc Players, Home Theater Systems, Tablets and Mobile Phones, Components Thereof and Associated Software*, Inv. No. 337-TA-882 (USITC). Pet. 3-4; Mandatory Notice (Paper 5) 1-2. Also, U.S. Patent No. 8,050,652 B2 is related to the '952 Patent and is the subject of a separate petition for *inter partes* review, which currently is pending before the Board.<sup>6</sup> Pet. 1.

*C. Statutory Bar*

Patent Owner asserts that the Petition must be denied as untimely. Prelim. Resp. 2. A statutory time bar regarding the institution of an *inter partes* review is set forth in 35 U.S.C. § 315(b), which provides as follows:

PATENT OWNER'S ACTION - An inter partes review may not be instituted if the petition requesting the proceeding is filed more than 1 year after the date on which the petitioner, real party in interest, or privy of the petitioner is served with a complaint alleging infringement of the patent. The time limitation set forth in the preceding sentence shall not apply to a request for joinder under subsection (c).

The parties acknowledge that on September 19, 2012, Petitioner was served with a complaint alleging infringement of the '952 Patent. *Id.* at 3; Pet. 3. Thus, under the statute, Petitioner must have filed its Petition by September 19, 2013. The filing date accorded to the Petition is September 18, 2013. Notice of Filing Date Accorded (Paper 3).

Patent Owner alleges that this filing date is improper because Petitioner did not effect service until September 20, 2013. Prelim. Resp. 4. In support of this assertion, Patent Owner provides a copy of an express mail

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<sup>6</sup> Case IPR2013-00594.

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label that shows acceptance of the package containing the service copy of the Petition by the U.S. Post Office on September 20, 2013. Ex. 2003. On January 14, 2014, the Board conducted a teleconference with the parties to discuss this issue. During the conference, Petitioner's counsel maintained that service was effected on September 18, 2013, by depositing the package containing the Petition in a U.S. Postal Service mail slot. Paper 19. On January 16, 2014, Petitioner filed a document certifying that it had served the Petition on September 18, 2013. Paper 20. In support of this certification, Petitioner filed copies of tracking information for the packages containing the Petition and the petition filed in IPR2013-00594,<sup>7</sup> which it alleges was served concurrently with the Petition in this matter. Ex. 1017, Ex. 1018. These exhibits show that the packages were processed by the U.S. Postal Service the afternoon of September 19, 2013, and set for departure from Los Angeles on that date. Ex. 1017, Ex. 1018. The exhibits also show that the Los Angeles Post Office processed the package containing the Petition again on September 20, 2013, while the package containing the petition filed in IPR2013-00594 proceeded to Raleigh, North Carolina. Ex. 1017, Ex. 1018.

Patent Owner cites 35 U.S.C. § 312(a) that states “[a] petition filed under section 311 may be considered only if— . . . (5) the petitioner provides copies of any of the documents required under paragraphs (2), (3), and (4) to the patent owner or, if applicable, the designated representative of the patent owner.” The statute, however, does not require that the documents be served on the Patent Owner, nor does it specify when the

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<sup>7</sup> Patent Owner does not allege that service was late for the petition in IPR2013-00594.

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Patent Owner must receive these documents. The statute, instead, requires that the Petitioner “provide[]” copies to the Patent Owner. Patent Owner was provided with, and did receive, copies of the documents in question. *See* Ex. 1017, Ex. 2003. We, therefore, decline to deny this Petition for failure to meet the requirements of 35 U.S.C. § 312.

Patent Owner also relies on 37 C.F.R. § 42.106, which states “[a] petition to institute *inter partes* review will not be accorded a filing date until the petition satisfies [the requirement of] . . . (2) [e]ffect[ing] service of the petition on the correspondence address of record as provided in § 42.105(a).” The evidence submitted in the matter demonstrates that Petitioner made a good faith effort to effect proper service in a timely manner. Based on the facts of this case, we are not persuaded that the accorded filing date is erroneous. Thus, we decline to deny the Petition for failure to meet the requirements of 35 U.S.C. § 315(b).

*D. Real Party-in-Interest*

Patent Owner alleges that Petitioner fails to identify all real parties-in-interest and thus, the Petition should be dismissed for noncompliance with 35 U.S.C. § 312(a) and 37 C.F.R. § 42.8(b)(1). Prelim. Resp. 5. Patent Owner asserts that Pioneer Corporation and Pioneer Electronics (USA) Inc. (collectively “Pioneer”) should have been identified in the Petition as real parties-in-interest. *Id.* at 6. Patent Owner and Pioneer currently are engaged in a patent infringement lawsuit in parallel with the patent infringement lawsuit between Patent Owner and Petitioner. *Id.* at 6-7. AV receivers, networked Blu-Ray players, and home theater systems from Pioneer and Petitioner are alleged to infringe claim 9 of the ’952 Patent. *Id.* Thus,

according to Patent Owner, Pioneer and Petitioner are aligned with respect to claim construction and invalidity of the claims asserted in the pending district court litigation. *Id.* at 7. Patent Owner also argues that Petitioner's counsel in this proceeding has spoken on behalf of Petitioner and Pioneer at a district court technology tutorial directed to the '952 Patent. *Id.* Finally, Patent Owner states that Pioneer's counsel agreed to be bound by the outcome of this proceeding if the district court would agree to stay the district court litigation. *Id.* at 7-8; Ex. 2008.

We are not persuaded that Pioneer is a real party-in-interest in this matter. A determination as to whether a non-party to an *inter partes* review is a real party-in-interest is a "highly fact-dependent question," based on factors such as whether the non-party "exercised or could have exercised control over a party's participation in a proceeding" and the degree to which a non-party funds, directs, and controls the proceeding. Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,759-60 (Aug. 14, 2012). In other words, the question before us is whether there is a non-party "at whose behest the petition has been filed" or a relationship "sufficient to justify applying conventional principles of estoppel and preclusion." *Id.* at 48,759.

On the record currently before us, we are not persuaded that Pioneer is in position to exercise control over Petitioner's involvement in this proceeding. It is common for one lawyer to speak on behalf of multiple parties at a technology tutorial. Often, this is done for efficiency purposes and by itself does not signify control over the various entities in the lawsuit. In addition, while Pioneer and Petitioner both may be interested in the patentability of the '952 Patent claims, this does not mean that the parties have the same interests. Litigation alliances may arise for numerous



reasons, including, but not limited to, parties having a similar perspective on one or more issues in a case. The existence of such alliances alone generally does not rise to the level that would require naming the ally/co-defendant as a real party-in-interest. Office Patent Trial Practice Guide, 77 Fed. Reg. at 48,760. We, therefore, will not deny the petition for failure to comply with 35 U.S.C. § 312(a) and 37 C.F.R. § 42.8(b)(1).

*E. The '952 Patent<sup>8</sup> (Ex. 1001)*

The '952 Patent is directed to methods and apparatuses that allow users to receive and play audio from various sources and to assign playlists over a network to a network-enabled audio device. Ex. 1001, Abstract. The specification lists several problems with prior art systems such as the cost and technical complexity associated with listening to streaming audio over the Internet and playing songs on a PC. *Id.* at 1:52-2:12. The invention of the '952 Patent was intended to alleviate such issues “by providing a network-enabled audio device for listening to a variety of audio sources with substantially equal convenience.” *Id.* at 2:15-19.

The inventive device may be used with a computer. *Id.* at 16:32-35. In that embodiment, software may be used to assign a playlist of songs to a network-enabled audio device. *Id.* This embodiment is illustrated in Figures 15 and 19B of the '952 Patent. Figure 15 is reproduced below:

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<sup>8</sup> The '952 Patent shares a specification with the '652 Patent, which is the subject of a separate petition for inter partes review that currently is pending before the Board. *See* IPR2013-00594.

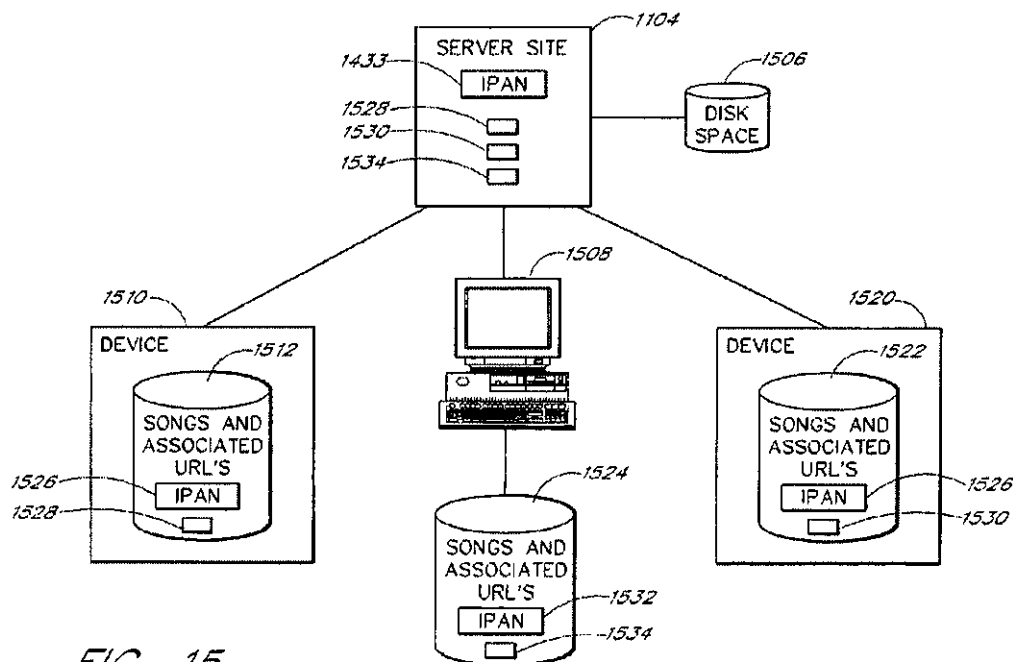


FIG. 15

Figure 15 is a block diagram illustrating the configuration between network-enabled audio devices and a stereo web site. *Id.* at 6:4-6. Figure 15 illustrates two network-enabled audio devices (1510 and 1520) connected to Internet Personal Audio Network (“IPAN”) server site 1104. *Ex. 1001*, 21:40-43. Storage spaces (1512 and 1522) of network-enabled audio devices (1510 and 1520) are used to store IPAN software 1526, playlist (1528 or 1530), and associated URLs and songs within the playlist. *Id.* at 21:43-57. Server site 1104 includes IPAN software 1433 and playlists (1528 and 1530). *Id.* at 21:52-57.

Figure 19B of the '952 Patent is reproduced below:

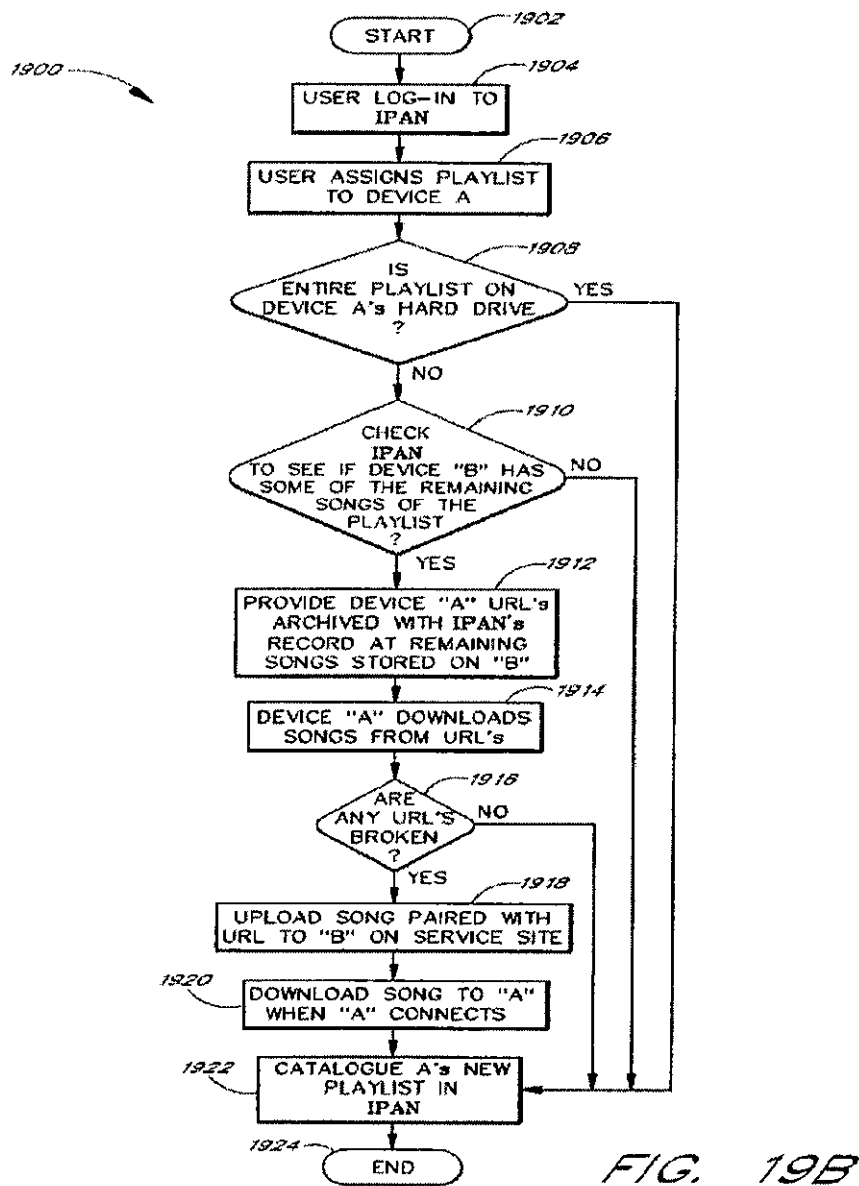


Figure 19B shows the process for assigning a playlist to a device. *Id.* at 6:60-61. At step 1908, a user assigns a playlist to first device 1510. *Id.* at 28:14-16. The system then determines whether all of the songs on the playlist are stored on the hard drive of first device 1510. Ex. 1001, 28:20-22. If any of the songs are missing from first device 1510, IPAN 1433 forms a list of remaining songs and checks the hard drive of second device 1520 to

determine whether any of the remaining songs may be found on that device. *Id.* at 28:24-30. If any of the songs is found on second device 1520, then IPAN 1433 will provide first device 1510 with URLs for those songs, and first device 1510 will attempt to download the songs from second device 1520. *Id.* at 28:30-43.

*F. Illustrative Claim*

Claim 9 of the '952 Patent is the sole independent claim at issue in this Petition and is illustrative of the claims at issue:

9. A method comprising:

receiving, at an electronic device, a playlist assigned to the electronic device, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;

receiving, at the electronic device, information enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source; and

obtaining the ones of the plurality of songs from the at least one remote source.

*G. Claim Interpretation*

We must determine the meaning of the claims before we analyze the proposed grounds of unpatentability. Consistent with the statute and legislative history of the America Invents Act<sup>9</sup>, we interpret claims of an unexpired patent using the broadest reasonable construction consistent with the patent specification. 37 C.F.R. § 42.100(b); *see also* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Under the

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<sup>9</sup> Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”).

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broadest reasonable construction standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). Petitioner seeks construction of the following terms: (1) “playlist assigned to the electronic device;” and (2) “wherein ones of the plurality of songs are not stored on the electronic device.” Pet. 9-12. Patent Owner responds to Petitioner’s proposed constructions and proposes a construction for the term “playlist.” Prelim. Resp. 17-20.

1. *“Playlist”/“Playlist Assigned to the Electronic Device”*

Independent claim 9 recites the term “playlist assigned to the electronic device.” Petitioner asserts that the term should be construed as “a list of songs that is to be transferred to a particular device selected by the user.” Pet. 9 (citing Ex. 1002 ¶¶ 12-14.). Patent Owner argues that “playlist” should be construed separately, and its construction should be “a list referencing media items arranged to be played in a sequence.” Prelim. Resp. 17. In addition, Patent Owner asserts that “assigned to the electronic device” requires no further construction, but if the Board decides that a construction is necessary, Patent Owner proposes that the proper construction is “directed to the electronic device.” *Id.* at 19.

The specification of the ’952 Patent defines “playlist 1528 . . . [as] a list of audio files and associated URLs of where the audio files were retrieved from.” Ex. 1001, 21:63-65. Patent Owner argues that the term also includes a requirement that the playlist be “arranged to be played in a sequence.” Prelim. Resp. 17-18 (citing Ex. 1001, 24:31-43). In support of

this argument, Patent Owner cites a discussion of Figure 17B. *Id.* This portion of the specification discusses audio player window 1792, which includes shuffle button 1796 and repeat button 1798. Ex. 1001, 24:31-43. These buttons may be used to vary the order of songs to be played and to continue playing songs for what could be an indefinite period of time. *Id.* On the current record, we are not persuaded that this description of audio player window 1792 narrows the previously cited definition of a playlist. Thus, on the record currently before us, we construe playlist to mean “a list of audio files or URLs of where the audio files were retrieved from.”

The parties also dispute whether the playlist must be transferred to a device or directed to a device. The specification describes an embodiment that does not have storage space for a playlist. Ex. 1001, 4:4-9. In this embodiment, the playlist is stored on the IPAN Manager or a PC. *Id.* Petitioner’s expert, Dr. Bove, opines that, in this embodiment, the playlist is not assigned to the device. Ex. 1002 ¶ 17. His statement, however, does not persuade us. The ’952 Patent specifically contemplates a scenario where the playlist is resident on one device and used by another device to play songs. On the current record, we are not persuaded that this term should be narrowed to exclude this embodiment. Thus, based on the record currently before us, we agree with Patent Owner’s proposal that the playlist is “directed to” rather than “transferred to” a device.

Finally, the parties dispute whether a user is required to select the device. The specification repeatedly describes assignment of a playlist to a particular device selected by a user. *See e.g.*, Ex. 1001, 4:57-58, 22:39-40, 24:45-48, 28:16, Fig.19B, and Fig. 19C<sub>1</sub>; *see also* Ex. 1002 ¶ 14 (noting that assignments are made to user-selected devices). Patent Owner asserts that

Petitioner is attempting to read an embodiment from the specification into the claim limitations and to exclude other embodiments. Prelim. Resp. 18-19. Patent Owner cites a portion of the specification discussing Figure 17E as an example of an embodiment excluded by Petitioner's proposed construction. *Id.* at 19 (quoting Ex. 1001, 25:3-8). Figure 17E illustrates the screen presented to a user in order to schedule a particular time or day to play a playlist. Ex. 1001, Fig. 17E. It shows the name of the playlist ("Favorites"), and it has a drop down box allowing the user to select the particular device to play this playlist. *Id.* Thus, even in this embodiment, the user selects the particular device. Therefore, on the record currently before us, we construe "playlist assigned to the electronic device" to mean "a list of audio files or URLs of where the audio files were retrieved from directed to a particular device selected by a user."

2. *"Wherein Ones of the Plurality of Songs Are Not Stored on the Electronic Device"*

Petitioner proposes that the plain meaning of "wherein ones of the plurality of songs are not stored on the electronic device" implies that the electronic device be capable of storing songs. Pet. 10. According to Petitioner, this limitation would have no meaning if no songs could be stored on the device. *Id.* Patent Owner asserts that this proposal "is both illogical and contrary to the teachings of the '952 Patent." Prelim. Resp. 20. As an alternative, Patent Owner proposes that the disputed term should be construed as "wherein *at least one* of the plurality of songs is not stored on the electronic device." *Id.* As both parties acknowledge, the specification describes an embodiment that does not have storage for songs. *See id.*, Pet. 10 (citing Ex. 1001, 3:57-4:9); *see also* Ex. 1001, 4:5-9 ("This embodiment

provides for a low-cost system that can play songs from playlists stored on the IPAN Manager or on the PC's storage space without having to store the audio files locally."'). Thus, on the record currently before us, we are persuaded that the broadest reasonable interpretation of the disputed language in light of the specification is "wherein at least one of the plurality of songs is not stored on the electronic device."

### *3. Remaining Claim Terms*

All other terms in the challenged claims are given their ordinary and customary meaning and need no express construction at this time.

## II. ANALYSIS

We turn now to Petitioner's asserted grounds of unpatentability and Patent Owner's arguments in its Preliminary Response to determine whether Petitioner has met the threshold standard of 35 U.S.C. § 314(a).

### *A. Grounds Based on Berman (Ex. 1012)*

#### *1. Overview of Berman*

Berman is directed to a playback unit that retrieves audio data from a remote server and plays songs that have been selected by the user. Ex. 1012, Abstract. An embodiment of Berman's playback unit is depicted in Figure 1, which is reproduced below.



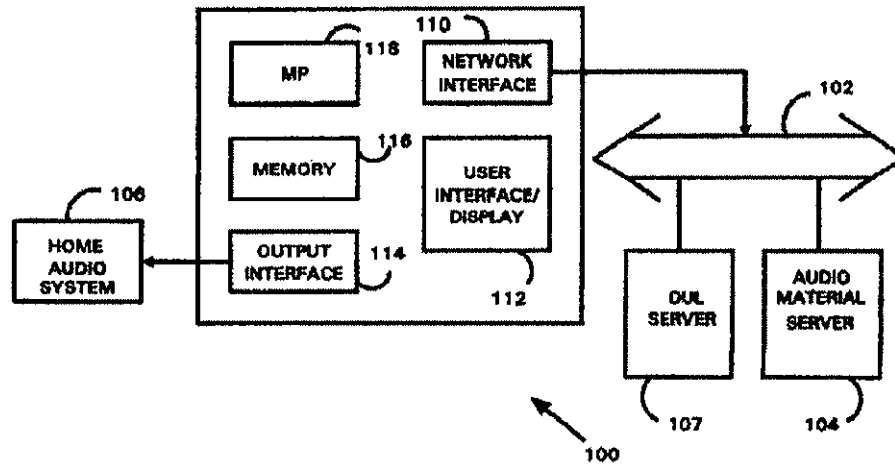


FIG. 1

Figure 1 is a block diagram of Berman's playback unit 100. Ex. 1012, 4:17-19. Playback unit 100 receives audio material from audio material server 104, and access rights to this material are controlled by directory and user list ("DUL") server 107. *Id.* at 4:51-53, 4:63-65. Playback unit 100 includes network interface 110 that facilitates communication with the servers over the Internet. *Id.* at 5:11-14. Memory 116 temporarily stores audio for playback and processing. *Id.* at 6:6-8. In certain embodiments, the user may be permitted to record a song to memory. *Id.* at 8:4-6.

The operation of the playback unit is illustrated in Figures 3 and 4, which are reproduced below:

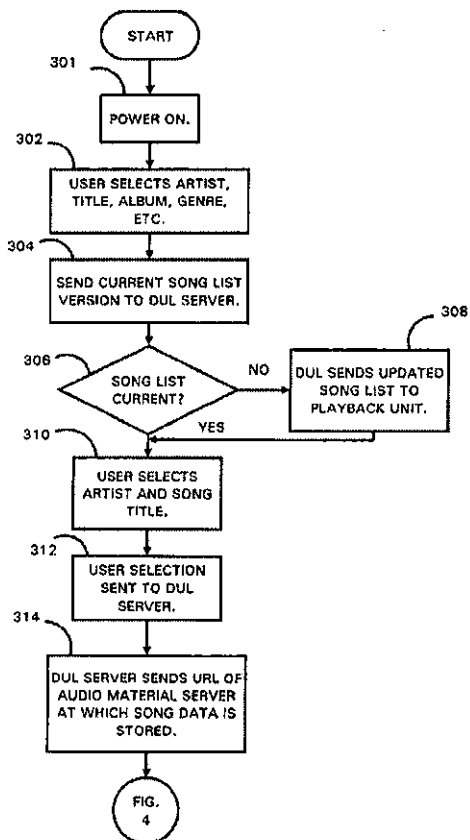


FIG. 3

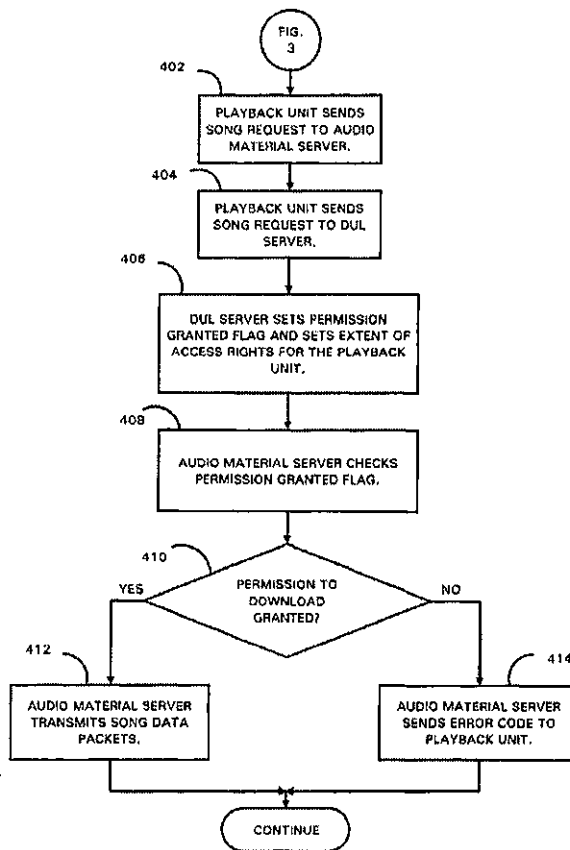


FIG. 4

Figures 3 and 4 are processing flow diagrams depicting the steps executed to request and receive audio material. Ex. 1012, 4:22-25. At step 302, the user selects a music category or type of song. *Id.* at 6:64-7:4. The playback unit then contacts the DUL server to confirm that the playback unit's song list is up to date. *Id.* at 7:4-6, Fig. 3 (step 304). If the song list is not up to date, the DUL server will send an updated song list to the device. *Id.* at 7:14-19, Fig. 3 (steps 306 and 308). The user selects a song from the song list. *Id.* at 7:22-24. The DUL server then sends playback unit 100 the network address or URL for the requested song. *Id.* at 7:30-41. Playback unit 100 then uses that URL to obtain the requested sound file or streaming audio from the

appropriate audio material server. Ex. 1012, 7:41-45, 8:32-34, Fig. 4 (steps 402 and 412).

2. *Analysis of Asserted Ground of Anticipation by Berman*

a) Independent Claim 9

Independent claim 9, in part, recites

receiving, at an electronic device, a playlist assigned to the electronic device, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device.

Petitioner argues that Berman discloses a playback unit that receives a song list from the DUL server. Pet. 17 (citing Ex. 1012, Fig. 3 (step 308)); *see also* Ex. 1012, 10:23-28 (describing song list packet sent to playback unit with a user ID “to confirm that the updated song list information was sent to and received by the correct playback unit”). Petitioner also asserts that the songs identified in the song list are stored on audio material server 104, and thus, the songs are not stored on the playback unit. *Id.* at 18 (citing Ex. 1012, 4:51-52).

Patent Owner asserts that Berman’s “song list” is not a “playlist” as recited by claim 9 and that the updated song list described in Berman does not disclose receiving a playlist assigned to the electronic device. Prelim. Resp. 21, 22. Patent Owner describes Berman’s song list as “a catalog of songs,” and thus, it falls within our construction of a playlist as a “list of audio files or URLs of where the audio files were retrieved from.” *See id.* at 22. As discussed above in Section I.G.1, for the purposes of this Decision, we construe “playlist assigned to the electronic device” to mean “a list of audio files or URLs of where the audio files were retrieved from directed to

a particular device selected by a user.” Patent Owner argues that Berman’s disclosure of updating of the song list at device initiation does not disclose this limitation. *Id.* On the current record, we disagree with Patent Owner. As Petitioner has shown, Berman discloses sending a song list to a specific device. *See* Ex. 1012, 10:23-28; *see also* Ex. 1012, Fig. 8 (illustrating the song list packet sent to a playback unit). In addition, Berman discloses an error checking mechanism to confirm that the updated song list was “received by the correct playback unit.” *Id.* 10:27. Thus, on this record, we are persuaded that Berman discloses receiving a playlist assigned to the electronic device.

As to the remaining limitations of claim 9, we have reviewed Petitioner’s supporting evidence and determine that Petitioner has met the threshold of 35 U.S.C § 314(a). On this record, we are persuaded that there is a reasonable likelihood that Petitioner will prevail in showing that claim 9 is anticipated by Berman.

b) Dependent Claims 10 and 14

Claims 10 and 14 depend from claim 9. Claim 10 recites, in relevant part, that the “electronic device is one of a plurality of associated electronic devices” and that “the at least one remote source is at least one other of the plurality of associated electronic devices.” Berman discloses a DUL server that associates a playback unit with a server through the use of a user identification code and a password. Pet. 18-19 (citing Ex. 1012, Figs. 3, 4, 7:55-66). In addition, Berman discloses an error checking mechanism to confirm that the updated song list was “received by *the correct* playback unit.” Ex. 1012, 10:27 (emphasis added); *see also id.* at 14:15-18 (“Using the appropriate network protocols, *the correct* server is contacted. For

example, different servers may have different types of musical genres . . . .”) (emphasis added). Thus, on this record, we are persuaded that Berman’s system includes a plurality of associated electronic devices as recited in claim 10. Therefore, on this record, we are persuaded that Petitioner has shown sufficiently that Berman discloses the limitations of claim 10.

Claim 14 recites, in relevant part, “wherein the personal audio network server enables a user to assign the playlist to the electronic device” and “receiving the information comprises receiving information from the personal audio network server.” Petitioner asserts that Berman’s DUL server 107 is a personal audio network server. Pet. 19. Petitioner further maintains that “[b]y selection of a song list, the user causes the updated song list to be assigned by the DUL server to the playback unit.” *Id.* at 20 (citing Fig. 3 (step 308)). Petitioner also argues that the playback unit receives a URL for the song data stored on the audio material server 104. *Id.* (citing Fig. 3 (step 314)). We are persuaded, on this record, that Petitioner has shown sufficiently that Berman discloses the limitations of claim 14.

Thus, for reasons stated above, on this record, we are persuaded that there is a reasonable likelihood that it will prevail in showing that claims 9, 10, and 14 are anticipated by Berman.

### *3. Analysis of Asserted Ground of Obviousness over Berman*

Petitioner contends that Berman would have rendered obvious claim 13 of the ’952 Patent. Pet. 34-35. Petitioner relies on claim charts and the Declaration of Dr. Bove to show how this reference allegedly teaches or suggests the claimed subject matter. *Id.*; Ex. 1002.

Claim 13 depends from claim 9, and recites,

wherein the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained, and obtaining the ones of the plurality of songs comprises:

requesting the ones of the plurality of songs from the at least one web site; and

receiving the ones of the plurality of songs from the at least one web site.

Petitioner asserts that it would have been obvious to one of ordinary skill in the art to use a web site as a remote source in place of Berman's servers. Pet. 20-21. Dr. Bove supports this position by stating that "[i]t would have been well known to one of ordinary skill in the art in 2000 that music files could be provided by a Web server. As one example, the MP3.com music server site launched in 1997." Ex. 1002 ¶ 19. Patent Owner argues that Dr. Bove's statement is conclusory and lacks factual underpinning. Prelim. Resp. 38-40. On the current record, we disagree with Patent Owner. Dr. Bove has stated that one of skill in the art would understand how to obtain music files from a web site, and he provided MP3.com as an exemplar of the web sites that would have been available at the relevant time. Thus, on the record currently before us, we are persuaded that Petitioner has shown sufficiently that Berman would have rendered obvious claim 13 of the '952 Patent.

*B. Asserted Anticipation Ground Based on Wolff (Ex. 1014)*

*1. Overview of Wolff*

Wolff is directed to a system and method for organizing and retrieving multimedia objects. Ex. 1014, Abstract. A remote controller is provided

that allows users to retrieve media objects including “Moving Picture Expert Group (MPEG) video[], MPEG audio Layer-3 (MP3), music compact discs (CD), etc.” *Id.* at 3:19-25. In one embodiment, the remote controller is a PDA that allows users to select remotely media objects from a network access appliance (“NAA”). *Id.* at 3:25-30. The remote controller sends one or more URLs or media items to the NAA, and the NAA plays each item in order. *Id.* at 3:61-64. The user may create a playlist containing a plurality of songs and upload that playlist from the remote controller to the server and the NAA. *Id.* at 8:16-33. In addition, a remote controller can send a playlist to another remote controller or another user. *Id.* at 8:59-63. The NAA may have memory to store media, but if the media is not stored in memory, the NAA will retrieve the requested selection from a server. *Id.* at 3:34-41, 5:28-32. Wolff’s system may include a plurality of NAAs and servers. *Id.* at Fig. 1. Each user of the remote controller has a personalized server to keep track of all services associated with the remote controller. *Id.* at 4:40-43. The personalized server may keep a copy of each media item, or the media objects may be located at different sites in the network. *Id.* at 4:51-53, 4:62-64.

2. *Analysis of Asserted Ground of Anticipation by Wolff*

Petitioner contends that Wolff anticipates claims 9, 10, and 14 of the ’952 Patent. Pet. 29-33. Petitioner relies on claim charts to show how this reference allegedly discloses the claimed subject matter. *Id.*

a) Independent Claim 9

Independent claim 9, in part, recites

receiving, at an electronic device, a playlist assigned to the electronic device, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device.

Petitioner asserts that Wolff discloses using a remote controller to create a playlist. Pet. 31-32 (citing Ex. 1014, Fig. 1, 4:37-64, 7:62-8:34). The playlist then may be uploaded to the personalized server. *Id.* Petitioner also argues that Wolff discloses a playlist assigned to each NAA. *Id.* at 32 (citing Ex. 1014, 8:31-33). In addition, Petitioner maintains that the songs in the playlist are associated with resource identifiers that enable the NAA to obtain the songs from servers. *Id.* (citing 3:30-41, 4:29-36, 58-64, 8:16-33).

Patent Owner argues that Wolff does not disclose “receiving, at an electronic device, a playlist assigned to the electronic device.” Prelim. Resp. 27. First, Patent Owner argues that Wolff’s playlist is not a “playlist” as claimed by the ’952 Patent because it “is simply a favorites list.” *Id.* at 28. Second, Patent Owner asserts that there is no evidence that the NAA ever receives a playlist. *Id.*

We are not persuaded by Patent Owner’s arguments. Wolff discloses the creation of a playlist of MP3s or audio files. *Id.* at 3:19-25; 8:16-32. As stated in Section I.G.1 above, for the purposes of this Decision, the term “playlist” is construed to be “a list of audio files or URLs of where the audio files were retrieved from.” Wolff discloses sending one or more URLs to the NAA. Ex. 1014, 3:61-64. On this record, we are persuaded that Wolff discloses the claimed playlist.

As to Patent Owner’s second argument, Wolff’s remote controller sends one or more URLs or media items to the NAA, and the NAA plays the songs associated with those URLs. Ex. 1014, 3:61-64. In addition, Wolff



discloses allowing the “user to easily find and select individual media objects or *entire play lists* on the remote controller and *request an NAA to play them.*” *Id.* at 8:29-31 (emphasis added). Further, personalized server 110 contains playlists obtained from the remote controller, and the NAA examines playlists stored on personalized server 110 so that the NAA will be able to play quickly the media indicated by the stored playlist. Ex. 1014, 4:40-44, 8:16-32. In Section I.G.1 above, we construed “playlist assigned to electronic device” to mean “a list of audio files or URLs of where the audio files were retrieved from directed to a particular device selected by a user.” Petitioner, on the record currently before us, has persuaded us that Wolff discloses a playlist directed to a particular device. Thus, on this record, Petitioner has shown sufficiently that Wolff discloses the disputed limitation.

As to the remaining limitations of claim 9, we have reviewed Petitioner’s supporting evidence and determine that Petitioner has met the threshold of 35 U.S.C § 314(a). On this record, we are persuaded that there is a reasonable likelihood that Petitioner will prevail in showing that claim 9 is anticipated by Wolff.

b) Dependent Claims 10 and 14

Claims 10 and 14 depend from claim 9. Claim 10 recites, in relevant part, that the “electronic device is one of a plurality of associated electronic devices” and that “the at least one remote source is at least one other of the plurality of associated electronic devices.” Wolff’s system discloses multiple NAAs and servers. Pet. 32; Ex. 1014, Fig. 1, 4:51-53, 8:23-26. We are persuaded, on this record, that Petitioner has shown sufficiently that Wolff discloses the limitations of claim 10.

Claim 14, recites, in relevant part, “wherein the personal audio network server enables a user to assign the playlist to the electronic device” and “receiving the information comprises receiving information from the personal audio network server.” Petitioner asserts that the playlist may be “received from personalized server 110, which is part of the personal audio network.” Pet. 33. In addition, “[personalized] server 110 enables the user to assign the playlist to the NAA 128, *e.g.*, by selection using the remote controller 130.” *Id.* (citing Ex. 1014, 5:22-33). Further, Petitioner asserts that the NAA receives playlists and URLs from personalized server 110 that allow the NAA to obtain songs from the server. *Id.* (citing Ex. 1014, 8:22-33). We are persuaded, on this record, that Petitioner has shown sufficiently that Wolff discloses the limitations of claim 14.

Thus, for reasons stated above, on this record, we are persuaded by Petitioner’s assertion that there is a reasonable likelihood that it will prevail in showing that Wolff anticipates claims 9, 10, and 14.

*C. Analysis of Asserted Grounds of Unpatentability over Leeke*

Petitioner asserts that Leeke anticipates or renders obvious claims 9, 10, 13, and 14 of the ’952 Patent. Pet. 21-29. Leeke discloses a content player and server. Ex. 1013, Abstract. Leeke’s system is composed of servers 102 and 144, client apparatuses 104 and 106, and electronic network 100. *Id.* at Fig. 1. Patent Owner argues that Leeke does not anticipate or teach the “receiving, at the electronic device, information enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source” limitation found in claim 9. Prelim. Resp. 23-25. Petitioner asserts that Leeke’s client apparatus 106 receives URLs that

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enable the player to obtain the songs from server 102. Pet. 26-27 (citing Ex. 1013, 4:50-52, 5:33-35, 19:59-20:49, 43:14-17). On the current record, we are not persuaded that Leeke discloses or teaches the disputed limitation. The cited portions disclose URLs used to update the database files in content entry subsystem 1600, which is located on the server. *See* Figs. 1 and 58, 43:13-17. Thus, the cited portions of Leeke do not describe sending URLs associated with a playlist to the client apparatus. *See* Prelim. Resp. 25-26. Therefore, we are not persuaded that Leeke anticipates or renders obvious claims 9, 10, 13, and 14 of the '952 Patent.

*D. Analysis of Asserted Grounds of Unpatentability over Lansonnic DAS-750*

Petitioner asserts that Lansonnic DAS-750 anticipates or renders obvious claims 9, 10, and 14 of the '952 Patent. Pet. 35-42. Petitioner also asserts that dependent claim 13 would have been obvious over Lansonnic DAS-750. *Id.* at 42. Lansonnic DAS-750 is a collection of web pages obtained using the Internet Archive Wayback machine. Pet. 35. "For a prior art reference to anticipate a claim, the reference must disclose each claim limitation in a single document." *Apple Inc. v. Int'l Trade Com'n*, 725 F.3d 1356, 1362 (Fed. Cir. 2013) (citing *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000)). Thus, as a threshold matter, we must determine whether Petitioner has shown sufficiently that Lansonnic DAS-750 is a single document. Petitioner asserts that these web pages were accessible from a menu on Lansonnic's home page. Pet. 35. We note, however, that only one page in Lansonnic DAS-750 includes navigation links that could link to the other pages of Lansonnic DAS-750. Ex. 1015, at 1. In addition, the pages in evidence show archive dates of June 19, 2000; August

15, 2000; August 17, 2000; and September 18, 2000. *Id.* at 1, 3, 5, 7. We are not persuaded that these web pages with varying archival dates are a single publication for purposes of a 35 U.S.C. § 102 analysis. Thus, we are not persuaded that Lansonic-DAS 750 anticipates claims 9, 10, and 14 of the '952 Patent.

As to the obviousness grounds, Patent Owner argues that Lansonic DAS-750 does not teach the “receiving, at the electronic device, information enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source” limitation found in claim 9. Prelim. Resp. 31-32. Petitioner asserts that the Lansonic DAS-750 device as described in the reference can play songs stored on other networked devices and, thus, “the playlist necessarily has information enabling the device to obtain the songs from the remote source.” Pet. 39. Dr. Bove concurs and opines that “[i]f such information were not there, the device would not be able to obtain the remotely stored songs.” Ex. 1002 ¶ 26. We are not persuaded that the Lansonic DAS-750 device as described by Exhibit 1002 necessarily requires such information as part of its playlist. Dr. Bove’s declaration does not contain sufficient technical detail or explanation to persuade us that Lansonic-DAS 750 must have the claimed “information.” Therefore, we are not persuaded that Lansonic DAS-750 would have rendered obvious claims 9, 10, 13, and 14 of the '952 Patent.

*E. Remaining Grounds*

Petitioner asserts that claims 9, 10, and 14 would have been obvious over Wolff and that claims 9, 10, and 14 are anticipated by Cluts. Pet. 33-34, 43-51. Petitioner, however, has not described any relative strengths or

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weaknesses of these additional asserted grounds distinguishing them from other grounds asserted. Therefore, the Board deems the remaining proposed grounds redundant, and we do not institute an *inter partes* review on them. See 37 C.F.R. § 42.108.

### III. CONCLUSION

We conclude that Petitioner has demonstrated a reasonable likelihood of prevailing on the following grounds of unpatentability asserted in the Petition:

Claims 9, 10, and 14 as anticipated by Berman;

Claim 13 as obvious over Berman; and

Claims 9, 10, and 14 as anticipated by Wolff.

The Petition is denied as to all other grounds proposed. The Board has not made a final determination on the patentability of the challenged claims.

### IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is granted as to claims 9, 10, 13, and 14 of the '952 Patent;

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '952 Patent is hereby instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial;

FURTHER ORDERED that the trial is limited to the grounds identified above and no other grounds set forth in the Petition as to claims 9, 10, 13, and 14 are authorized; and

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FURTHER ORDERED that an initial conference call with the Board is scheduled for 4 PM Eastern Time on April 9, 2014. The parties are directed to the Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,765-66 (Aug. 14, 2012), for guidance in preparing for the initial conference call, and should be prepared to discuss any proposed changes to the Scheduling Order entered herewith and any motions the parties anticipate filing during the trial.

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# **EXHIBIT 5**



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(12) **United States Patent**  
Qureshey et al.

(10) **Patent No.:** US 8,045,952 B2  
(45) **Date of Patent:** \*Oct. 25, 2011

(54) **METHOD AND DEVICE FOR OBTAINING PLAYLIST CONTENT OVER A NETWORK**

(75) **Inventors:** Safi Qureshey, Santa Ana, CA (US); Daniel D. Sheppard, Brea, CA (US)

(73) **Assignee:** Horsham Enterprises, LLC, Wilmington, DE (US)

(\* ) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1292 days.

This patent is subject to a terminal disclaimer.

(21) **Appl. No.:** 11/563,227

(22) **Filed:** Nov. 27, 2006

(65) **Prior Publication Data**  
US 2007/0089135 A1 Apr. 19, 2007

**Related U.S. Application Data**

(63) Continuation of application No. 09/805,470, filed on Mar. 12, 2001, now abandoned, which is a continuation-in-part of application No. 09/096,703, filed on Jun. 12, 1998, now abandoned.

(60) Provisional application No. 60/246,842, filed on Nov. 8, 2000, provisional application No. 60/072,127, filed on Jan. 22, 1998.

(51) **Int. Cl.**  
H04B 1/06 (2006.01)  
H05K 11/00 (2006.01)  
G06F 15/16 (2006.01)  
H04N 5/445 (2006.01)

(52) **U.S. Cl. ...** 455/344; 455/3.02; 455/3.06; 455/414.3; 709/219; 725/45

(58) **Field of Classification Search** ..... 455/344, 455/185.1, 186.1, 188.1, 3.02, 3.06, 142, 455/414.1, 414.3, 66.1, 556.1, 557, 558; 709/217, 219; 725/39, 45, 18

See application file for complete search history.

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(57) **ABSTRACT**

A network-enabled audio device that provides a display device that allows the user to select playlists of music much like a jukebox is disclosed. The user can compose playlists from disk files, CD's, Internet streaming audio broadcasts, online music sites, and other audio sources. The user can also select a desired Web broadcast from a list of available Web broadcasts. In addition, the user can play standard audio CD's and MP3 encoded CD's and have access to local AM/FM stations. Further, the software, the user controls, and the display in the network-enabled audio device are operably configured and connected such that the user can listen to playlists that include CD's and other audio sources just as the user would choose a playlist in a jukebox. The user accesses a server site via a PC and the Internet. From the server site, the user obtains a list of the devices in his or her Internet Personal Audio Network (IPAN) and what songs are on those devices. The IPAN includes an IPAN server, an IPAN client, and IPAN software stored on the network-enabled audio device. Thus, the network-enabled audio device provides people who are or are not comfortable with computers a way of taking music from various sources and putting it into one place for listening pleasure. In one embodiment, the Personal Computer (PC) is used to compose the playlists, but the user is able to listen to playlists and other audio sources without using the PC.

26 Claims, 49 Drawing Sheets

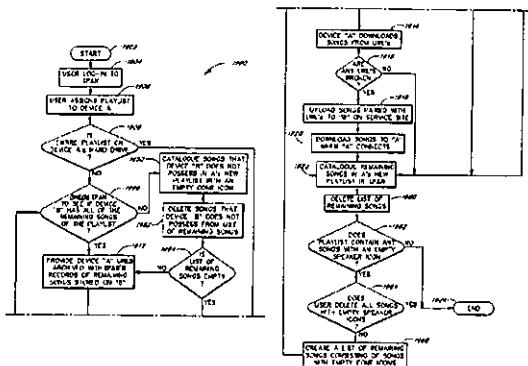


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\* cited by examiner

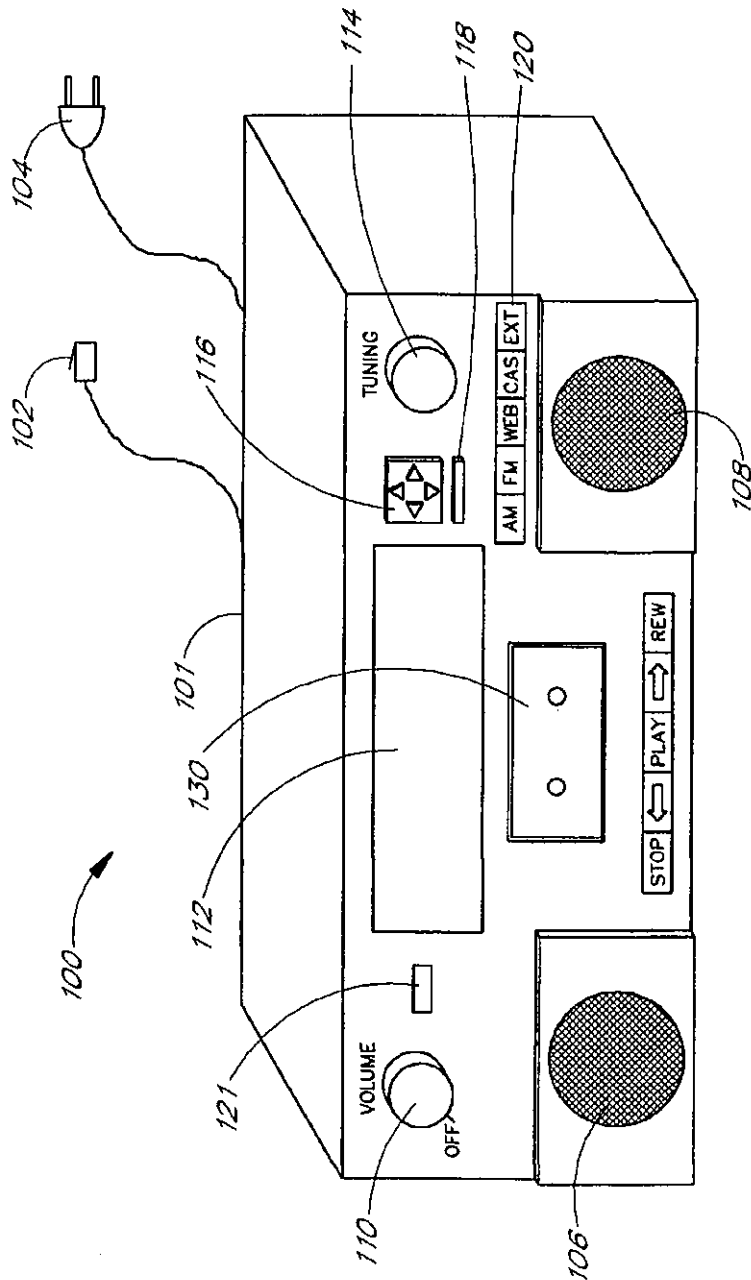


FIG. 1

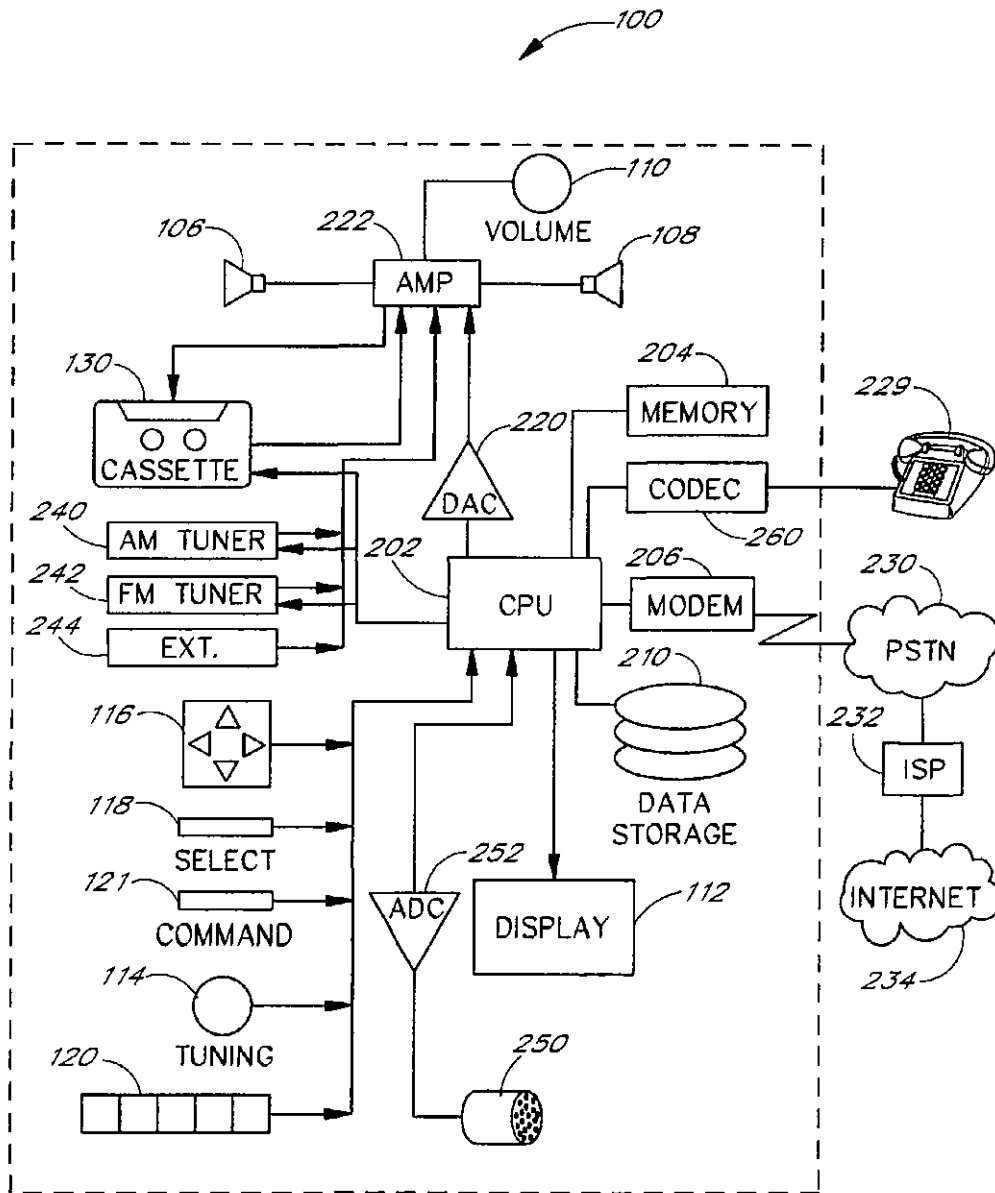


FIG. 2

300

Clip	pnm://audio.npr.org/news.auto.ra
11:01 Newscast - 17-August-1997 http://www.npr.org/ National Public Radio 1997	
Status: Streaming RealAudio from audio.npr.org...	
Pre-recorded Net Bandwidth: 96% Ch. Rate 8000bps	

FIG. 3A

323

320

321

322

TUNE STATION	▲
SET CLOCK	
SET ALARM	
SCAN STATIONS	
SELECT LANGUAGES	□
DEFINE STATION	▼

FIG. 3B

310

315

316

317

318

313

312

314

LANGUAGES	
<input checked="" type="checkbox"/> ENGLISH	OK
<input type="checkbox"/> FRENCH	CANCEL
<input type="checkbox"/> GERMAN	CLEAR ALL
	SELECT ALL

FIG. 3C

FIG. 3D

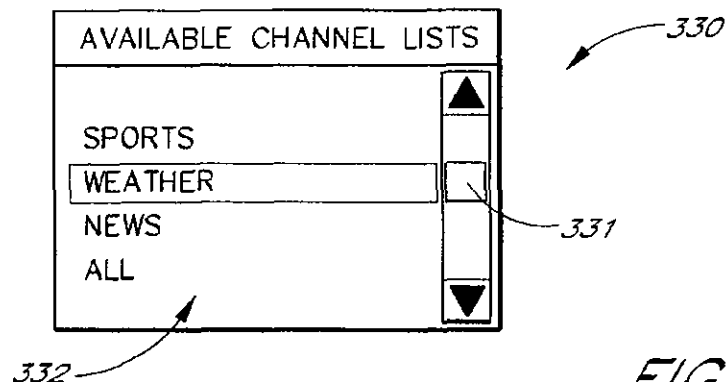


FIG. 3E

FIG. 3E shows a table (340) with three columns: "ID", "Description", and "Address". The table lists several news sources. A vertical scrollbar is on the right side (341). The "City" entry is selected, indicated by a checked checkbox in the "ID" column (343).

ID	Description	Address
<input type="checkbox"/> ABC	ABC Hourly News	<a href="http://www.rbn.com/clg-bin/r.pl?swave/abc/wnews.ra">http://www.rbn.com/clg-bin/r.pl?swave/abc/wnews.ra</a>
<input type="checkbox"/> AFnews	AirForce Radio News update	<a href="http://www.af.mil/news/radio/latest.ram">http://www.af.mil/news/radio/latest.ram</a>
<input checked="" type="checkbox"/> City	Citynews from around the w...	<a href="http://www.citynews.co.uk/">http://www.citynews.co.uk/</a>
<input type="checkbox"/> Counter...	CounterSpin-weekly rt win...	<a href="http://www.webactive.com/webactive/content/cspin">http://www.webactive.com/webactive/content/cspin</a>
<input type="checkbox"/> DlyFeed	The Daily Feed- Satire colu...	<a href="http://www.dailyfeed.com/Latest_Feed.html">http://www.dailyfeed.com/Latest_Feed.html</a>
<input type="checkbox"/> EIC-env	Environmental Information...	<a href="http://www.webactive.com/webactive/audio/raconten">http://www.webactive.com/webactive/audio/raconten</a>
<input type="checkbox"/> Earth	Earth and Sky daily update	<a href="http://www.earthsky.com/today.ram">http://www.earthsky.com/today.ram</a>
<input type="checkbox"/> IaAgg	Iowa Agrigulture news	<a href="http://www.wagnews.com/features/news/ianews.html">http://www.wagnews.com/features/news/ianews.html</a>
<input type="checkbox"/> Leeza	Leeza's entertainment upda...	<a href="http://www.premrad.com/">http://www.premrad.com/</a>
<input type="checkbox"/> MFarm	Missouri Farm Report	<a href="http://www.agnews.com/audio/momr.ram">http://www.agnews.com/audio/momr.ram</a>

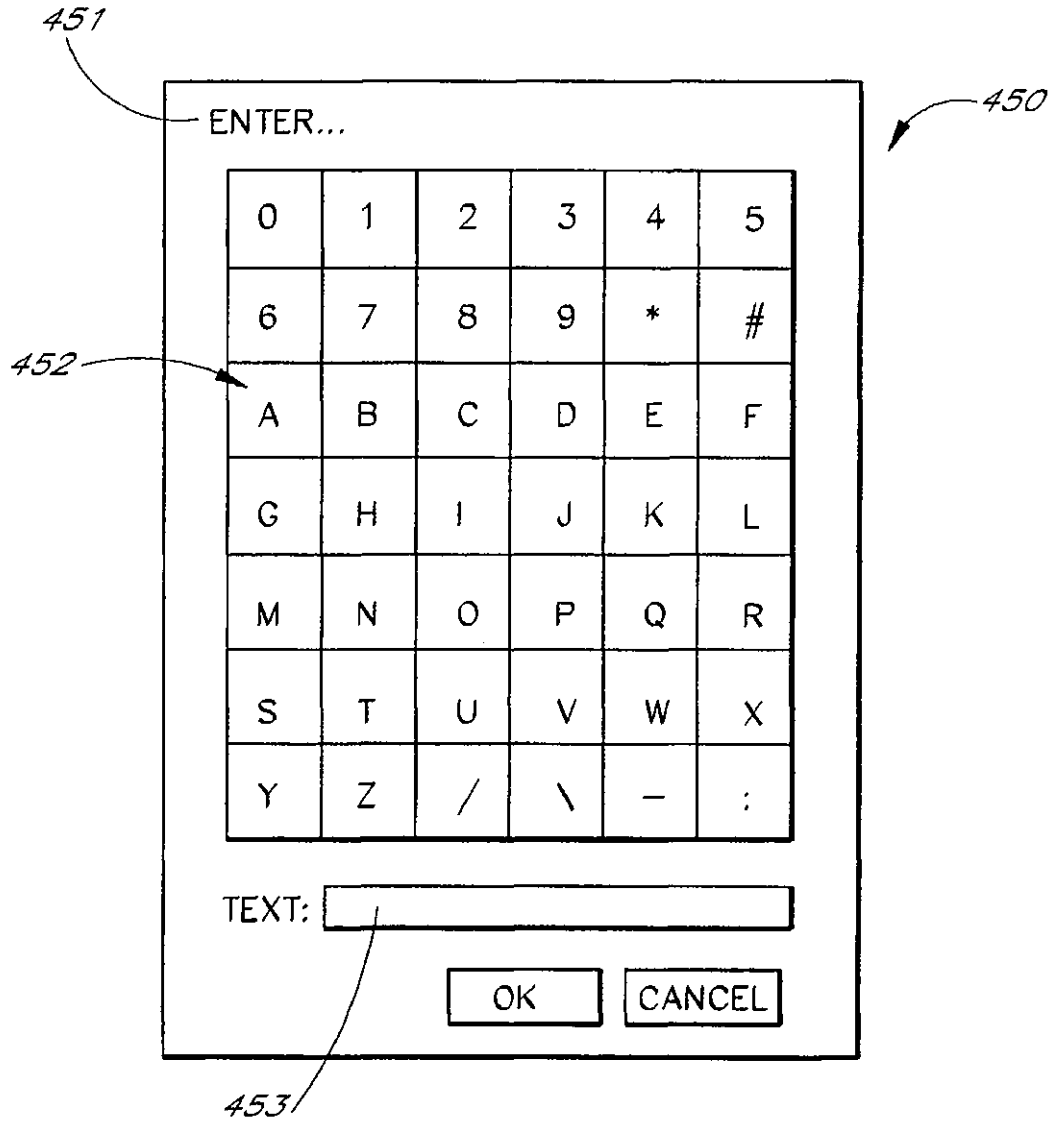


FIG. 4

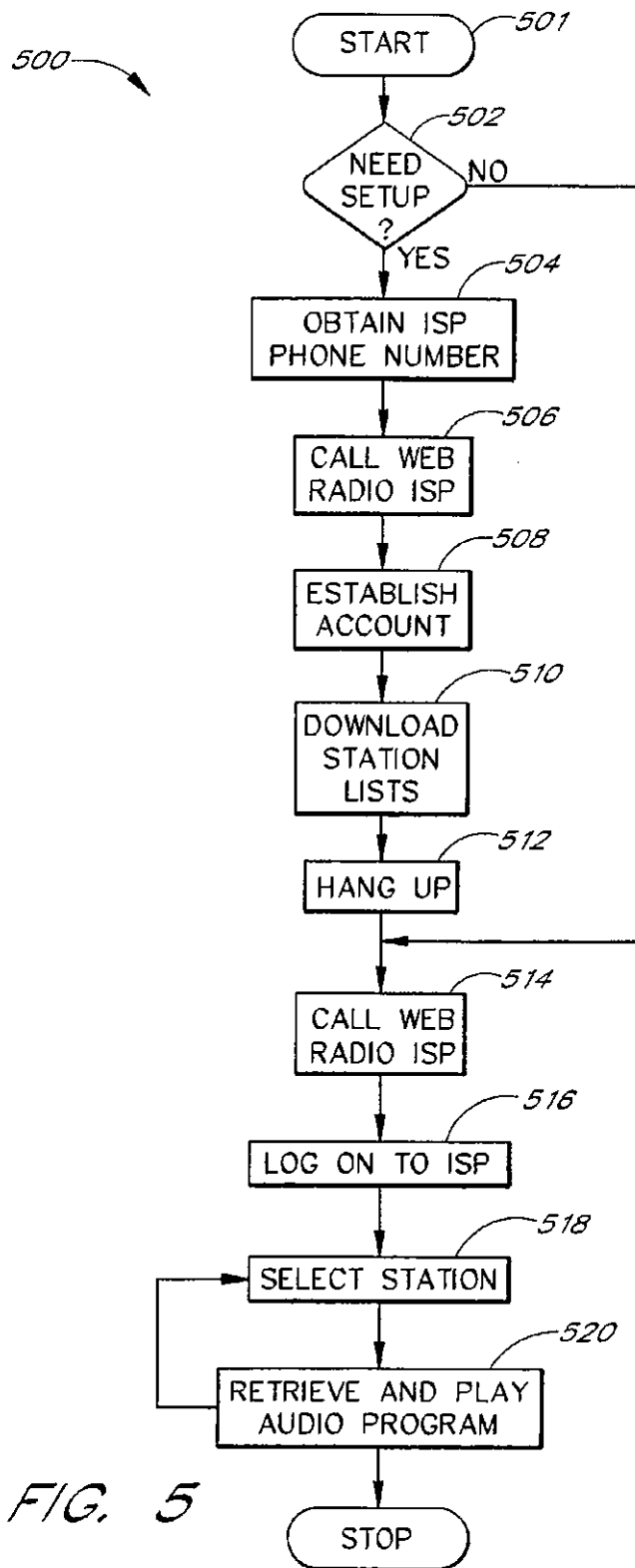


FIG. 5



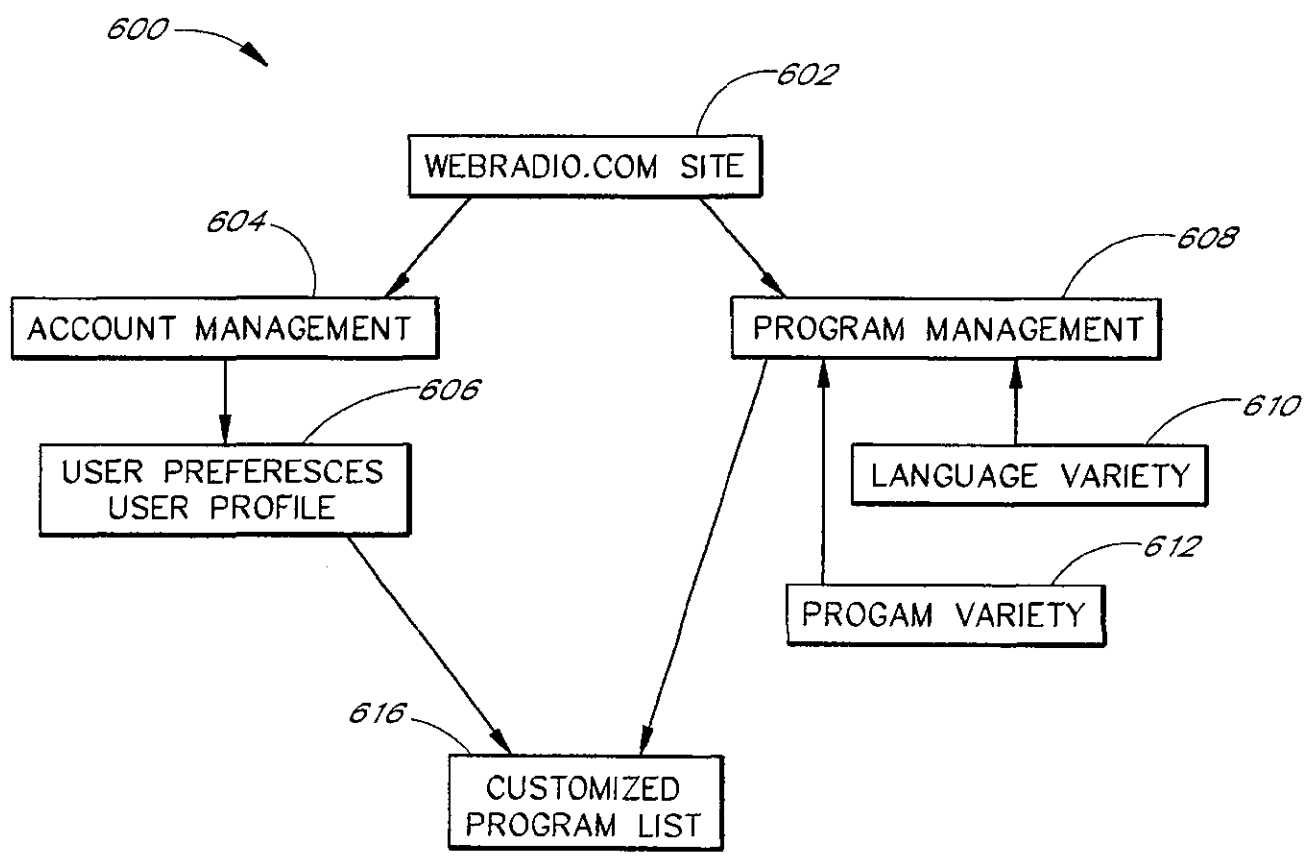


FIG. 6

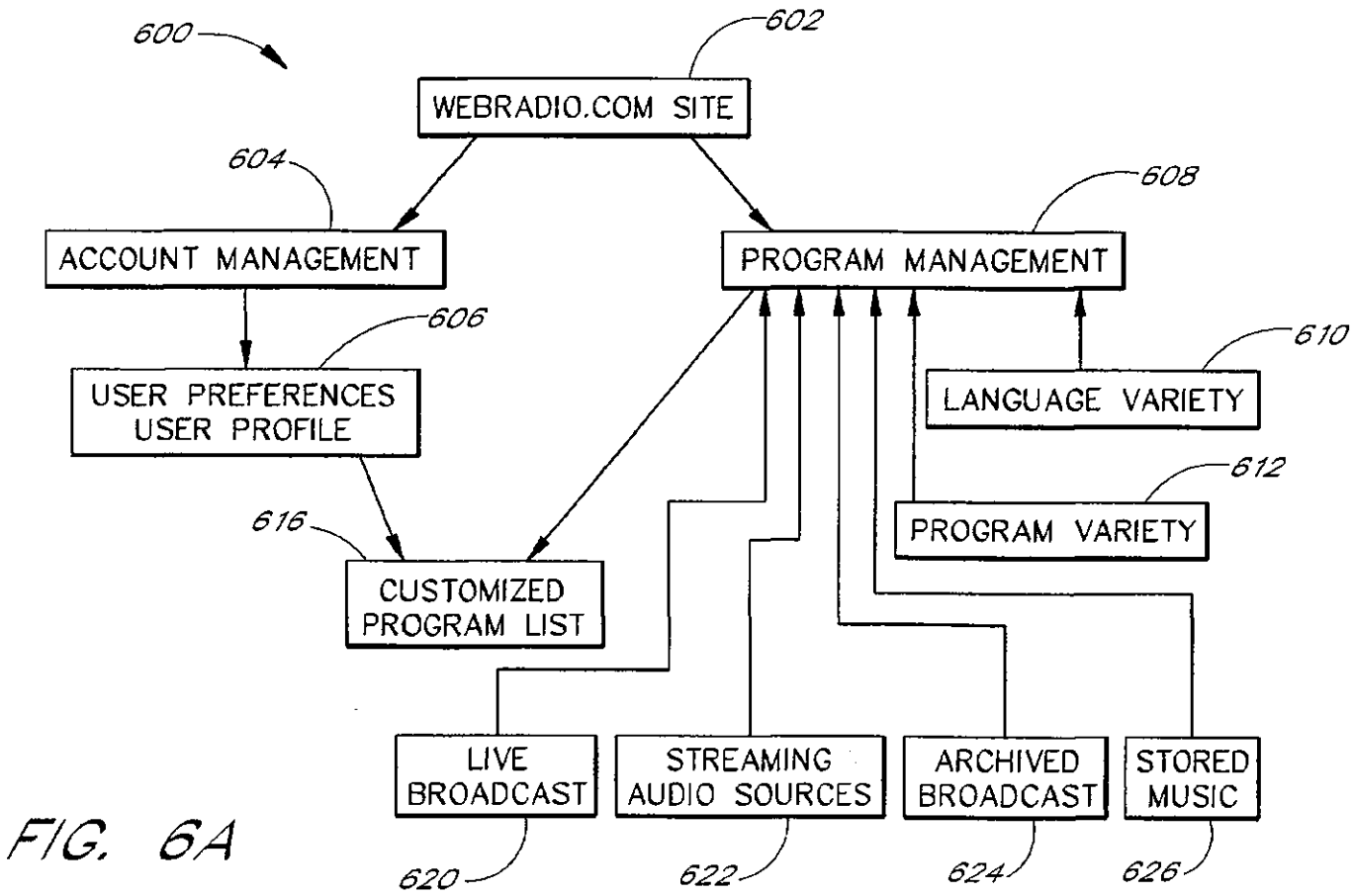


FIG. 6A

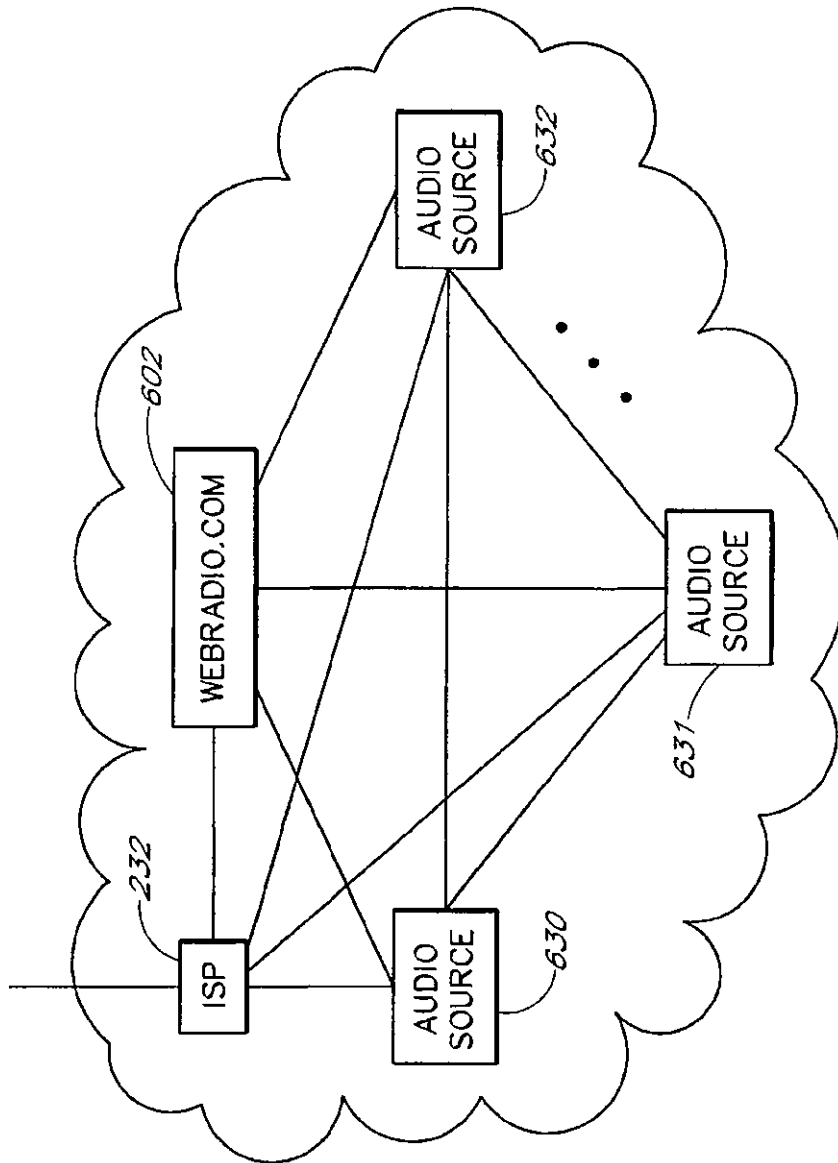


FIG. 6B

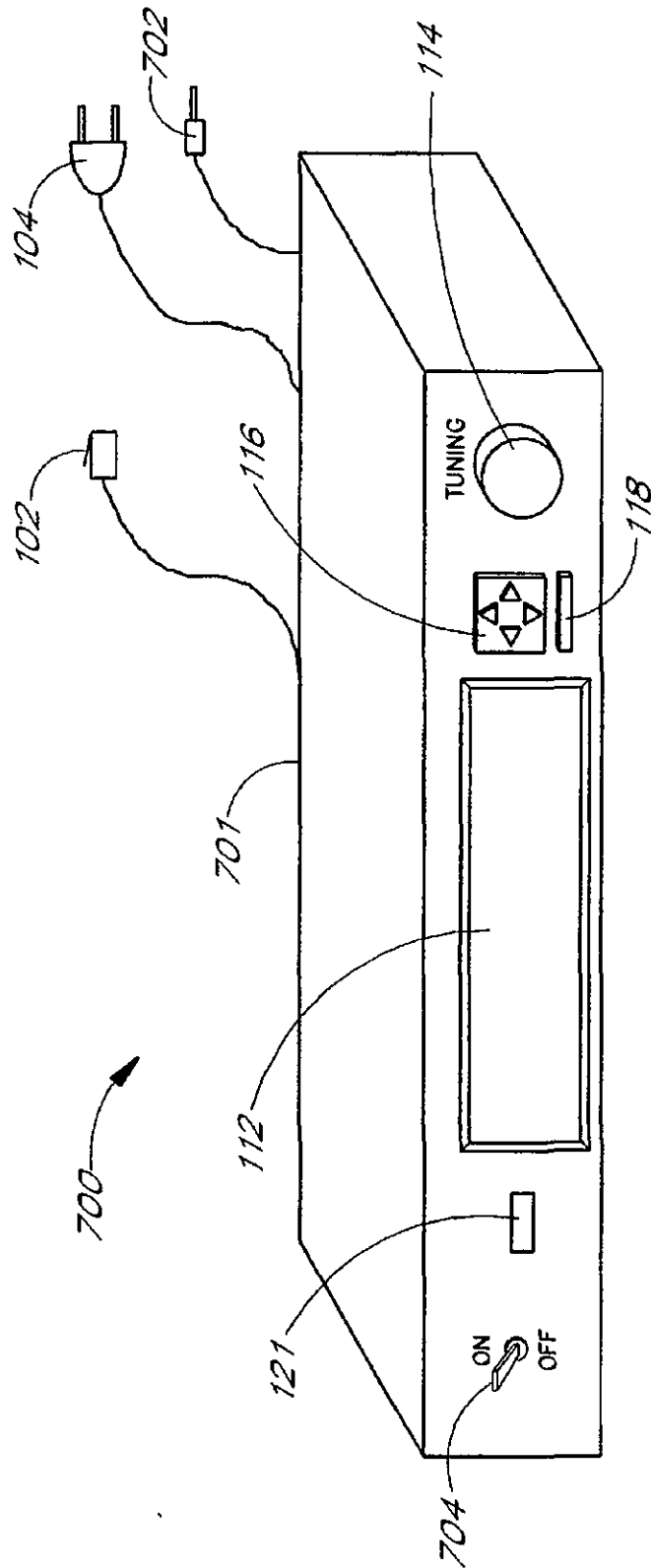


FIG. 7

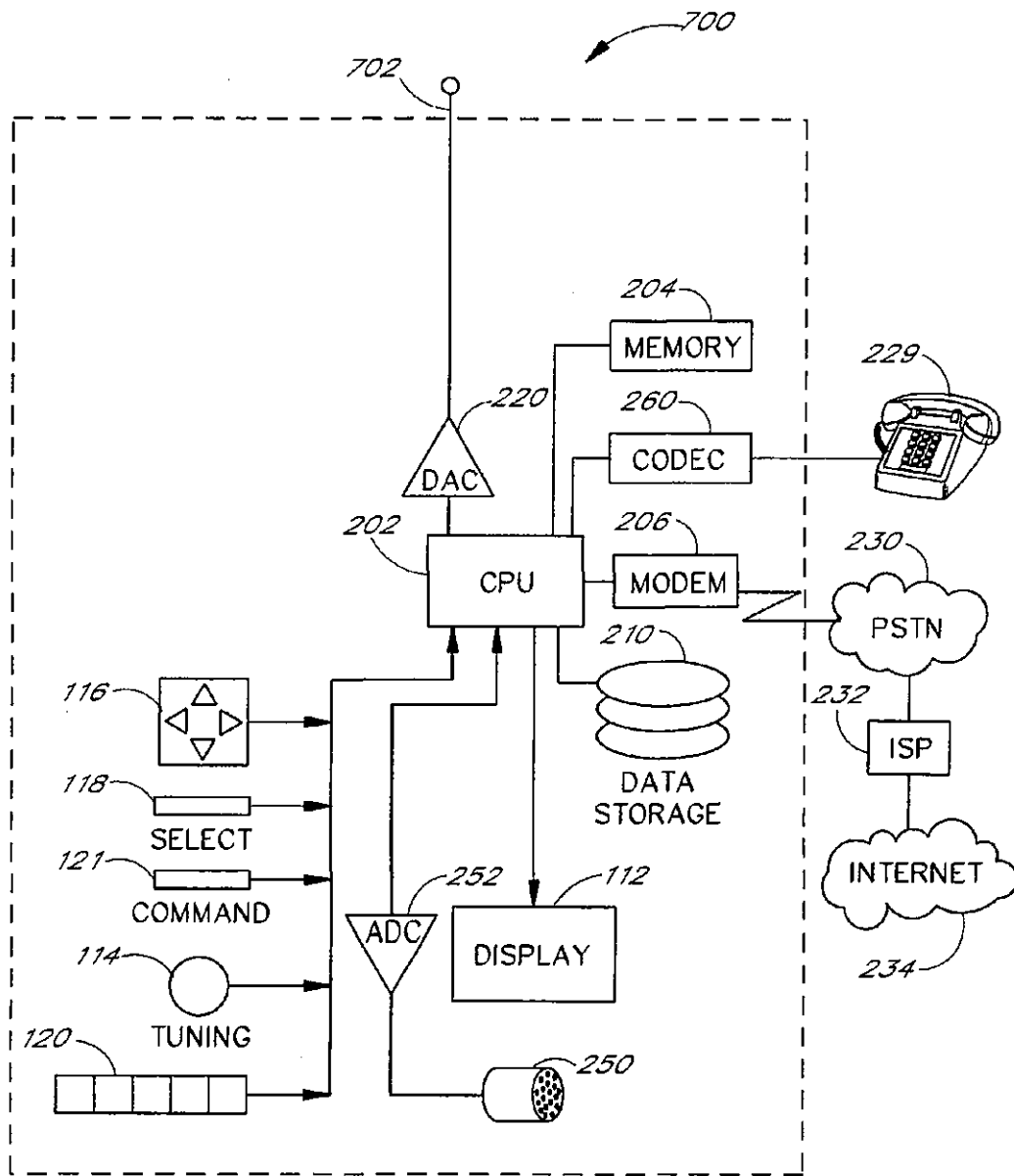


FIG. 8

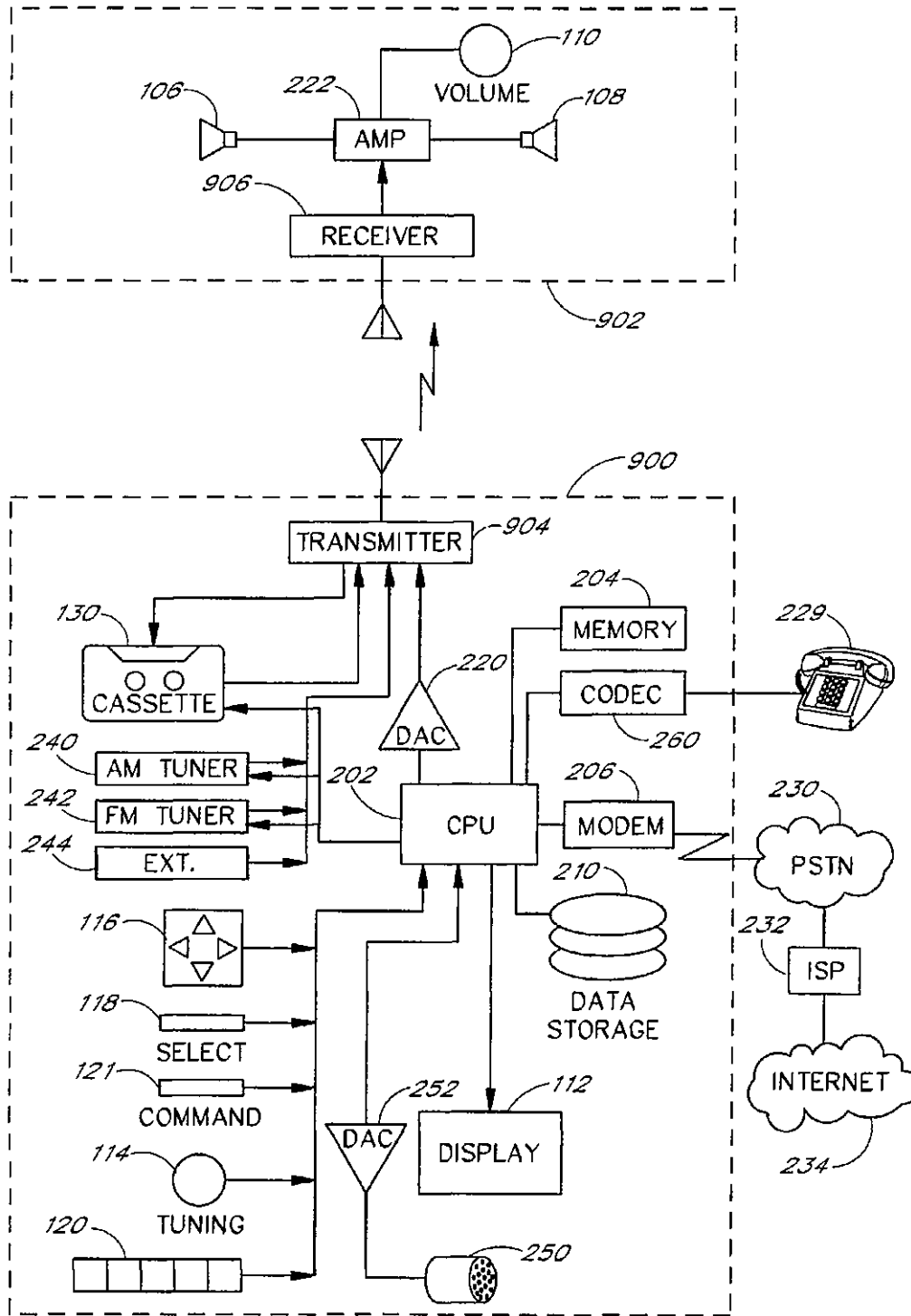


FIG. 9

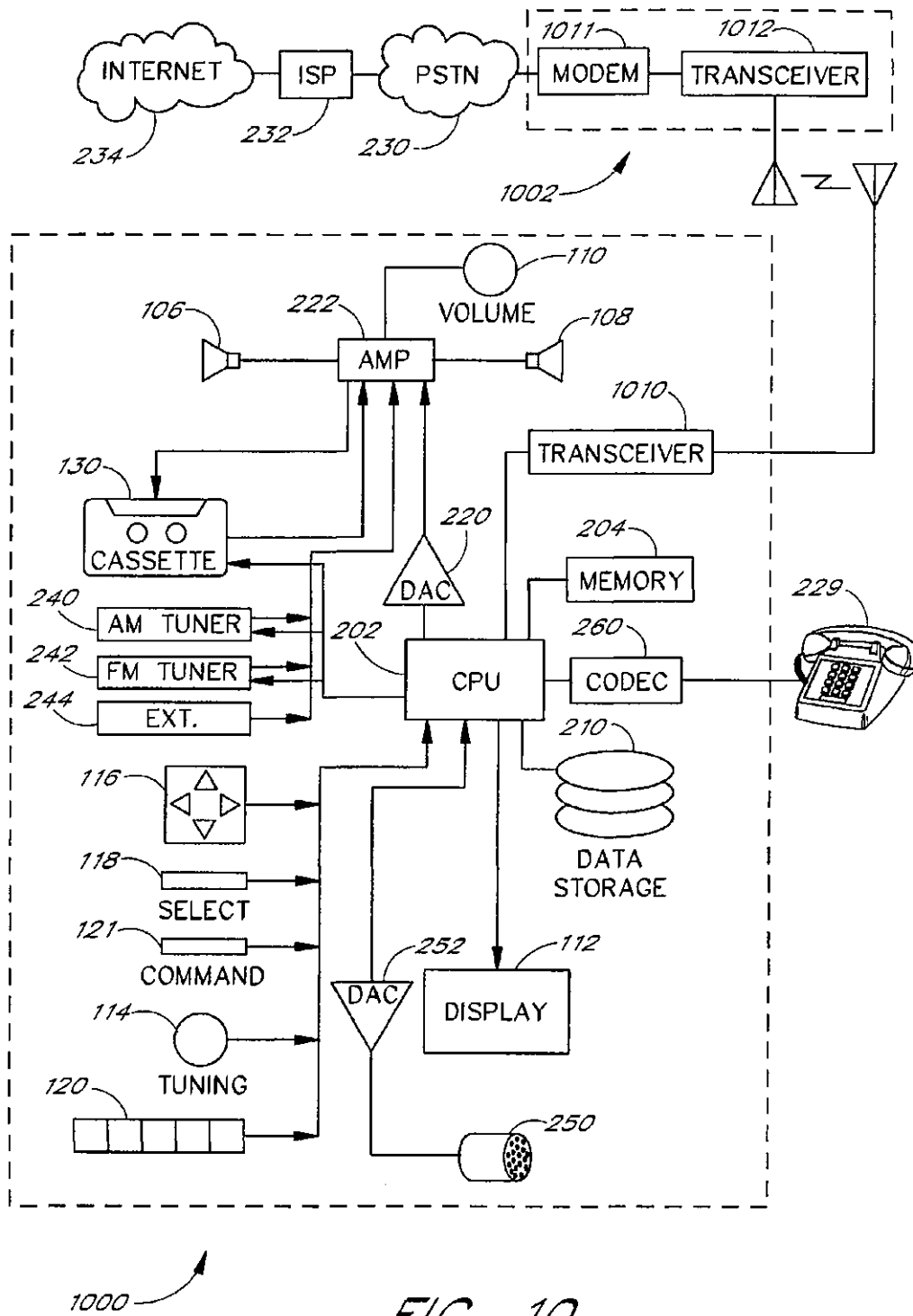


FIG. 10

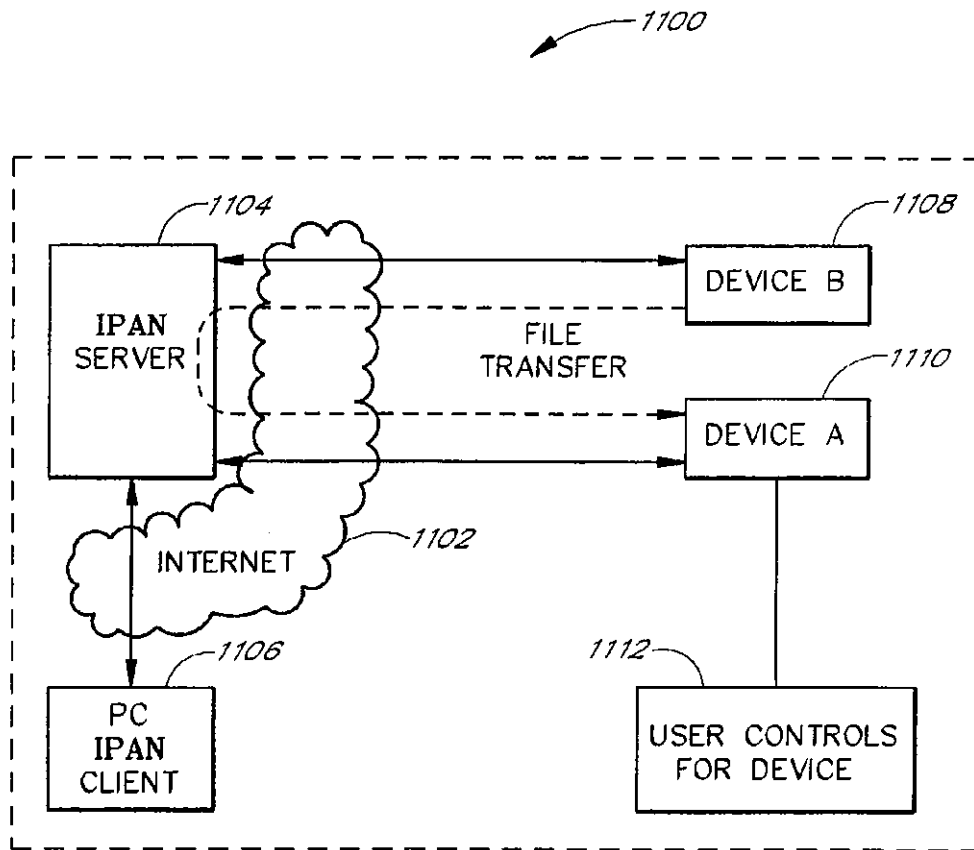


FIG. 11



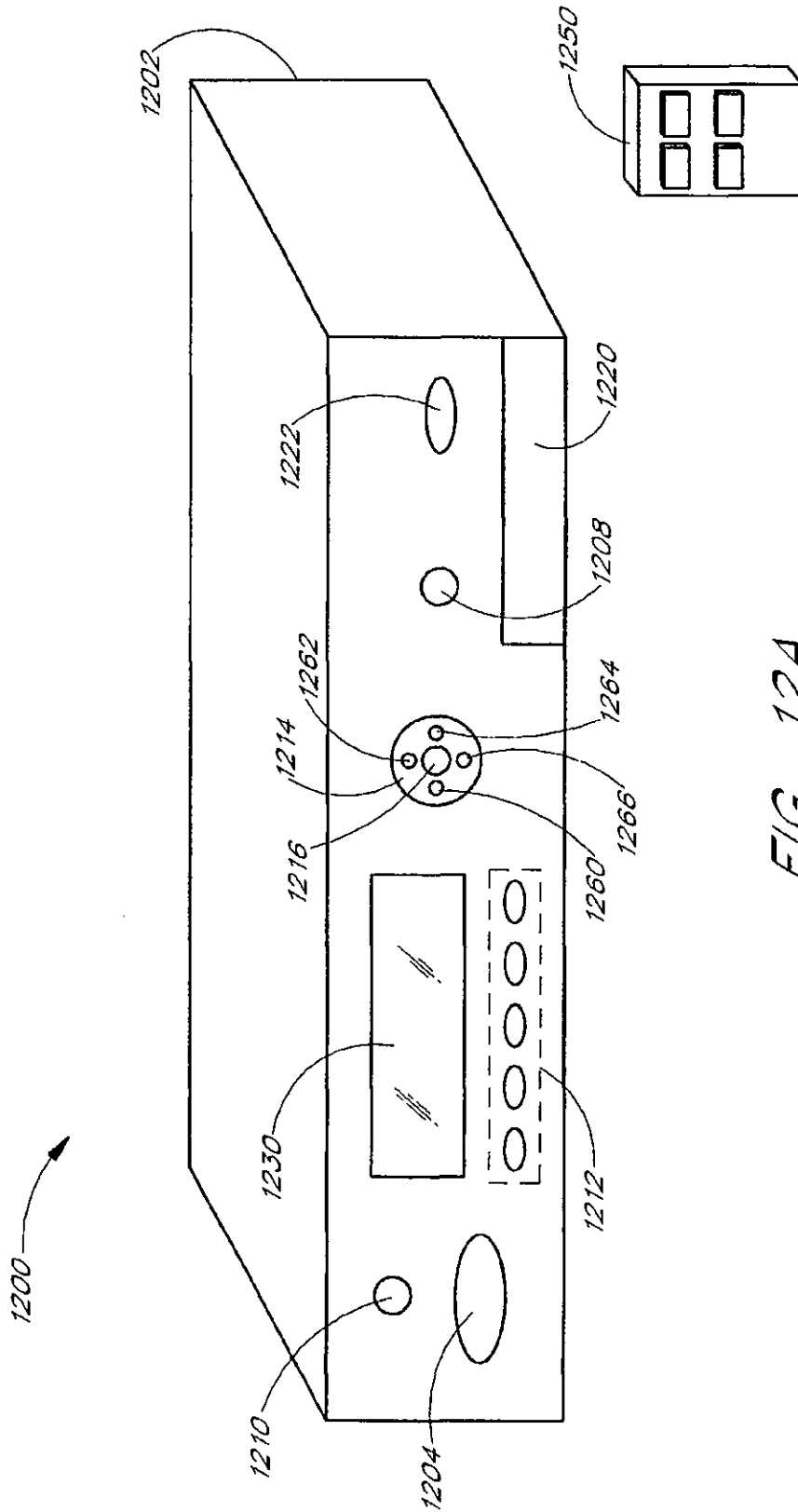
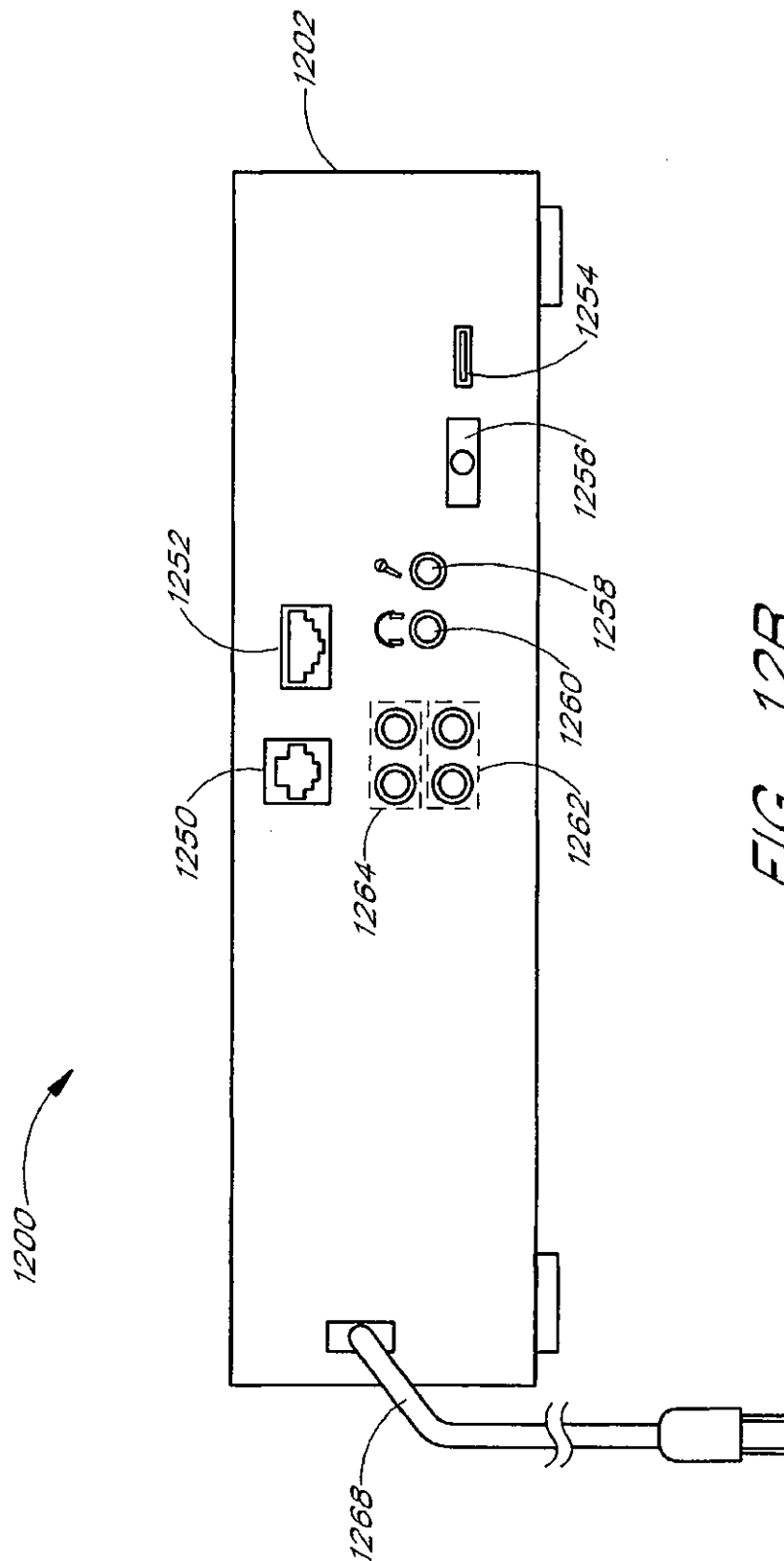


FIG. 12A



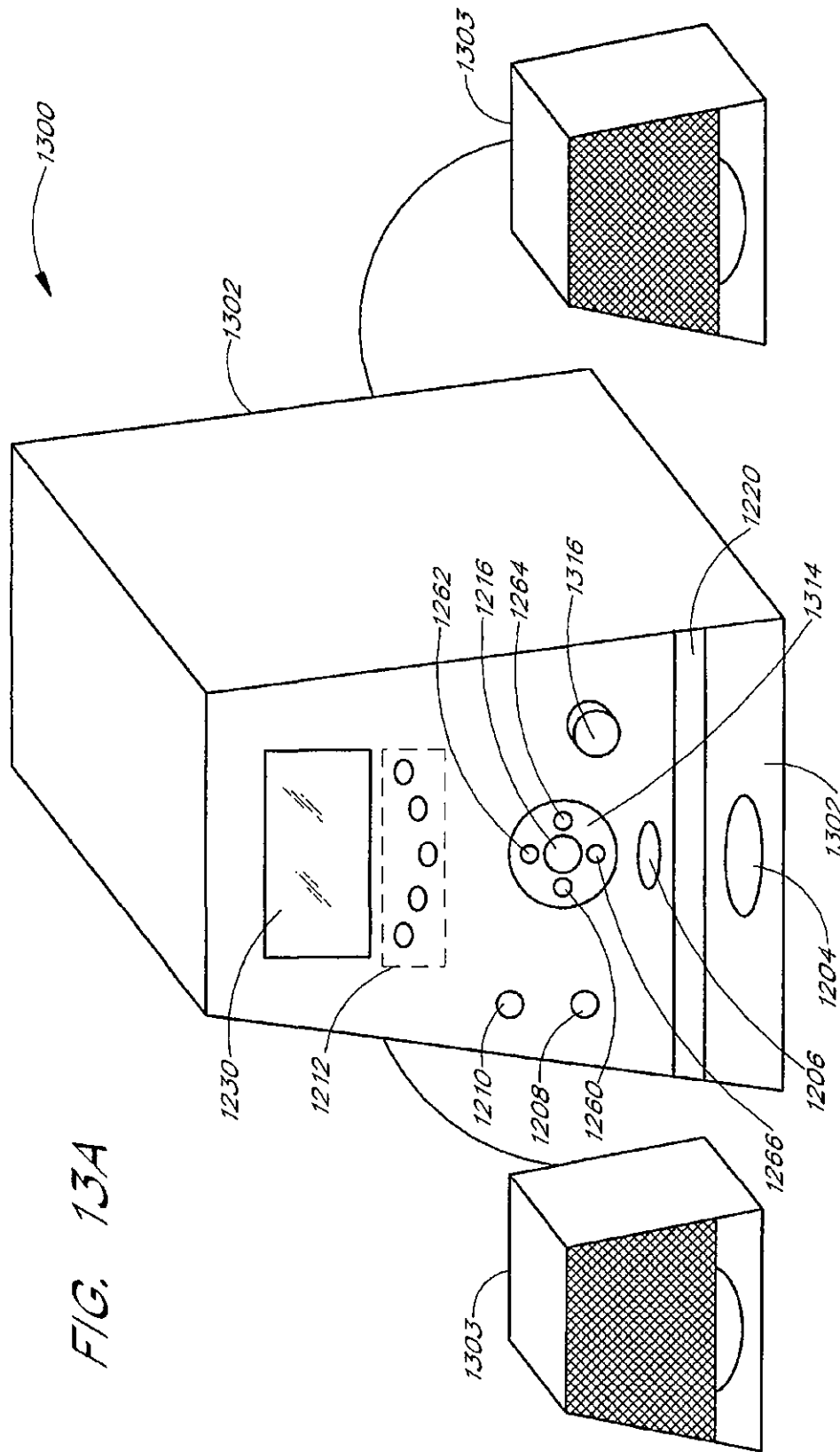


FIG. 13A

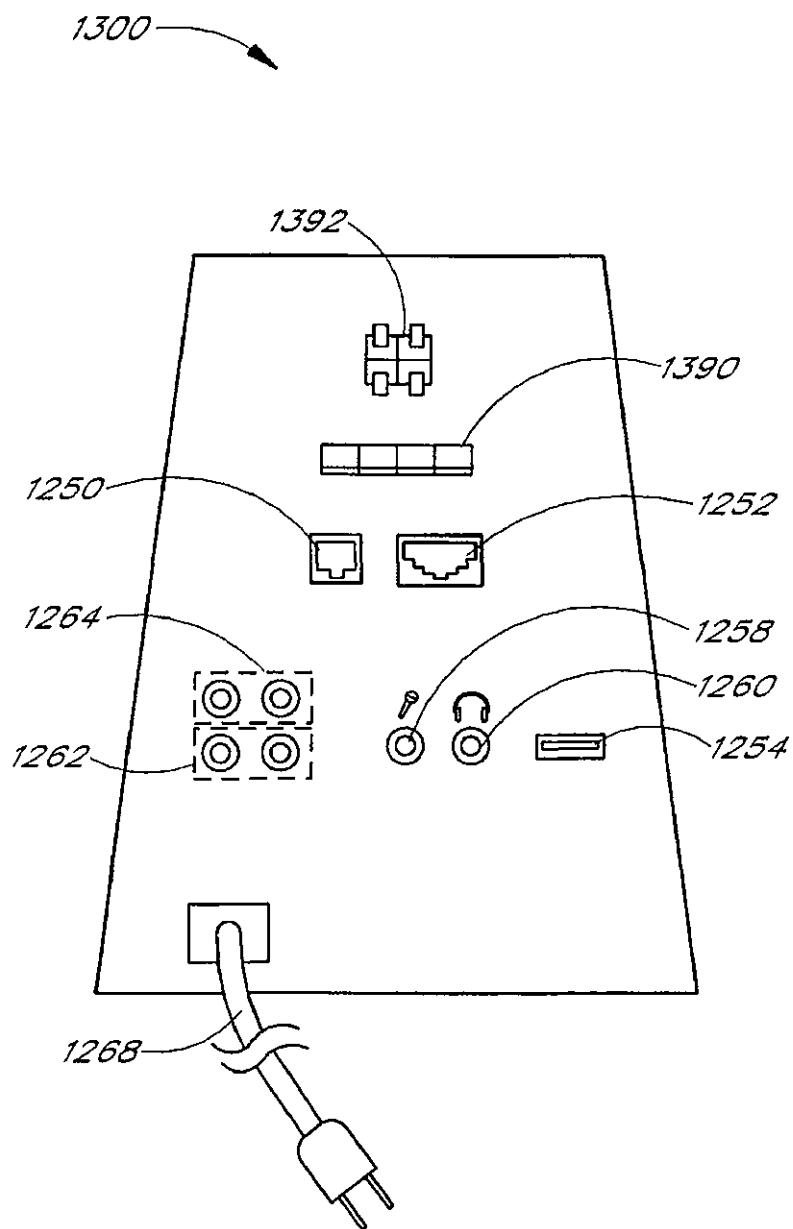


FIG. 13B

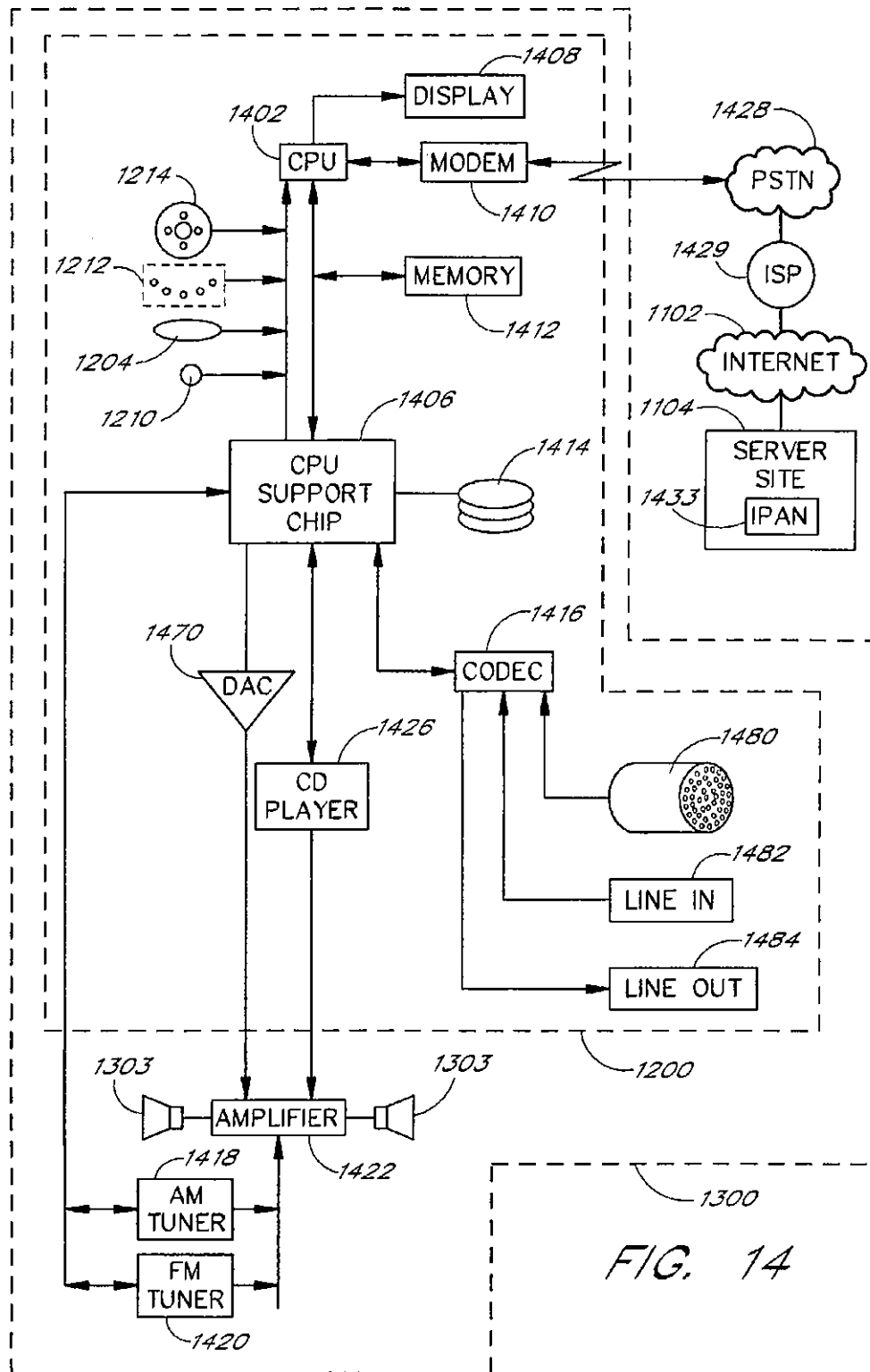


FIG. 14

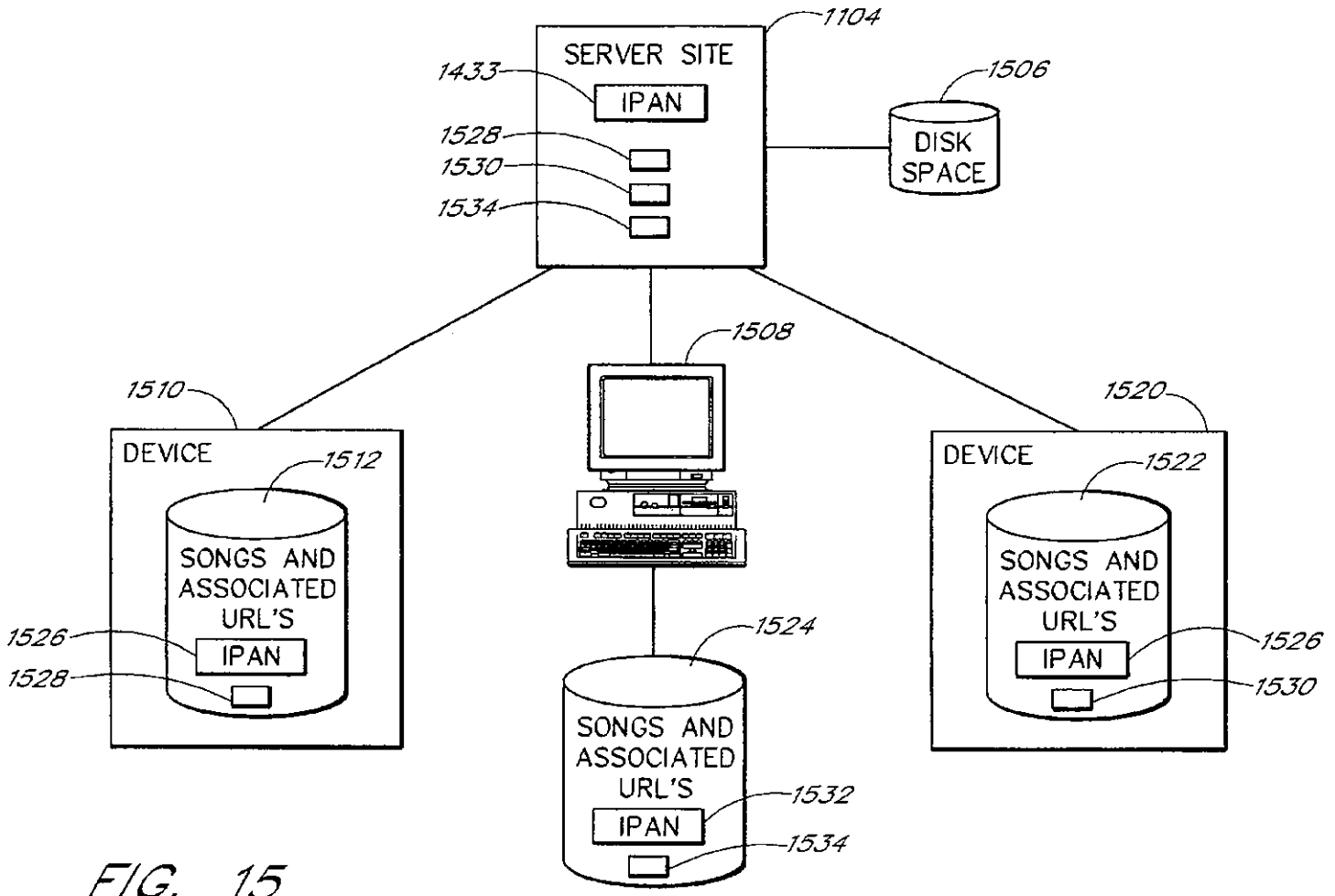


FIG. 15

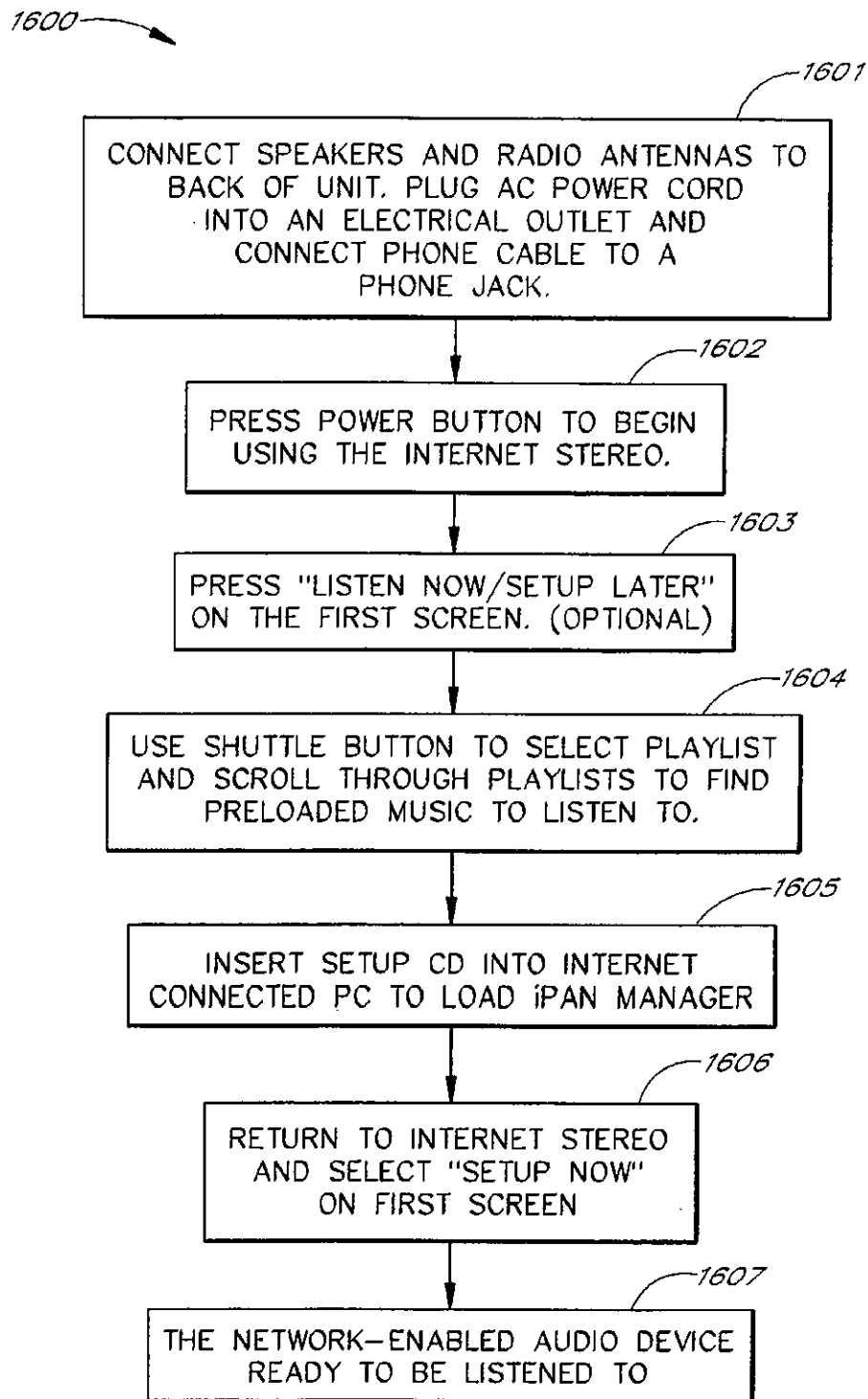


FIG. 16

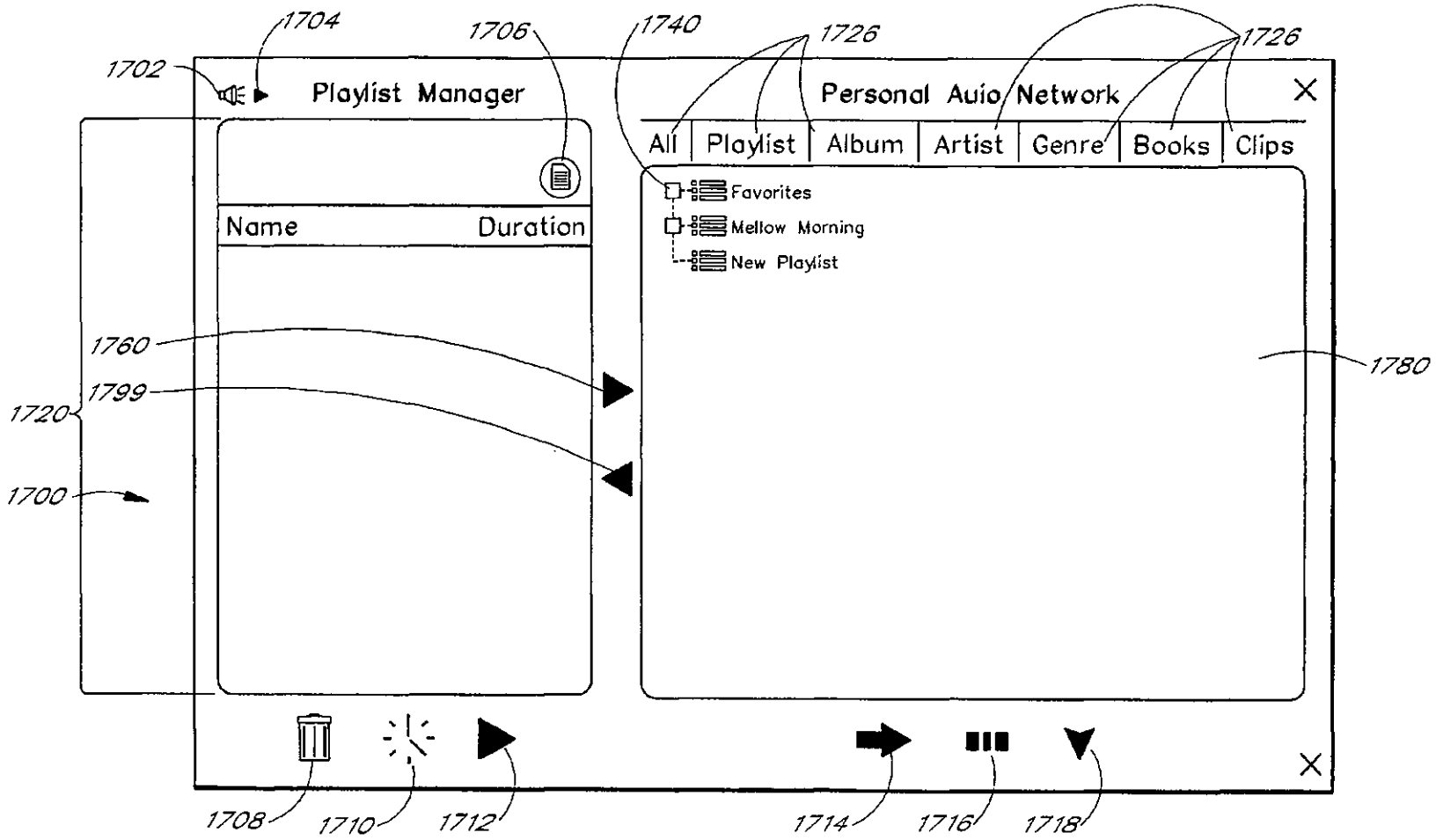


FIG. 17A



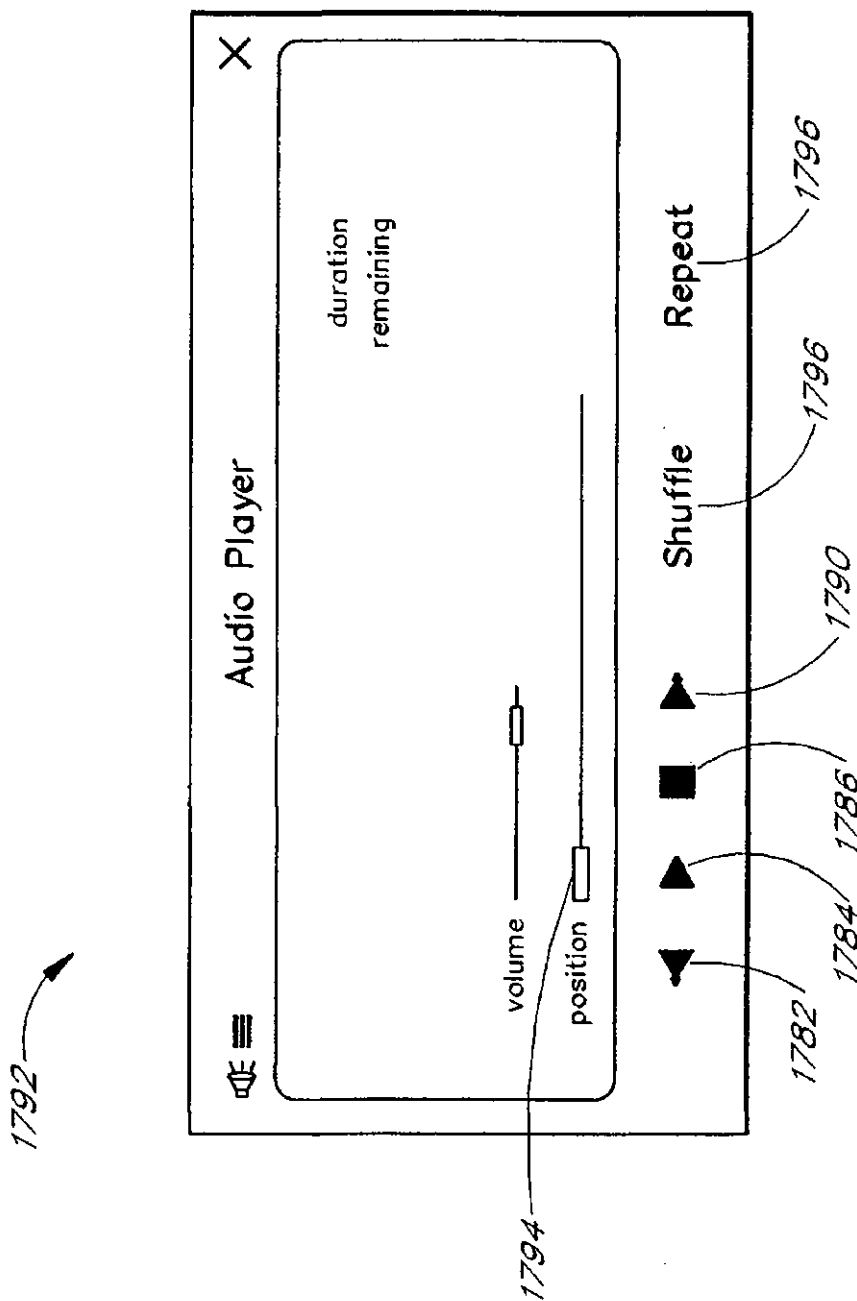
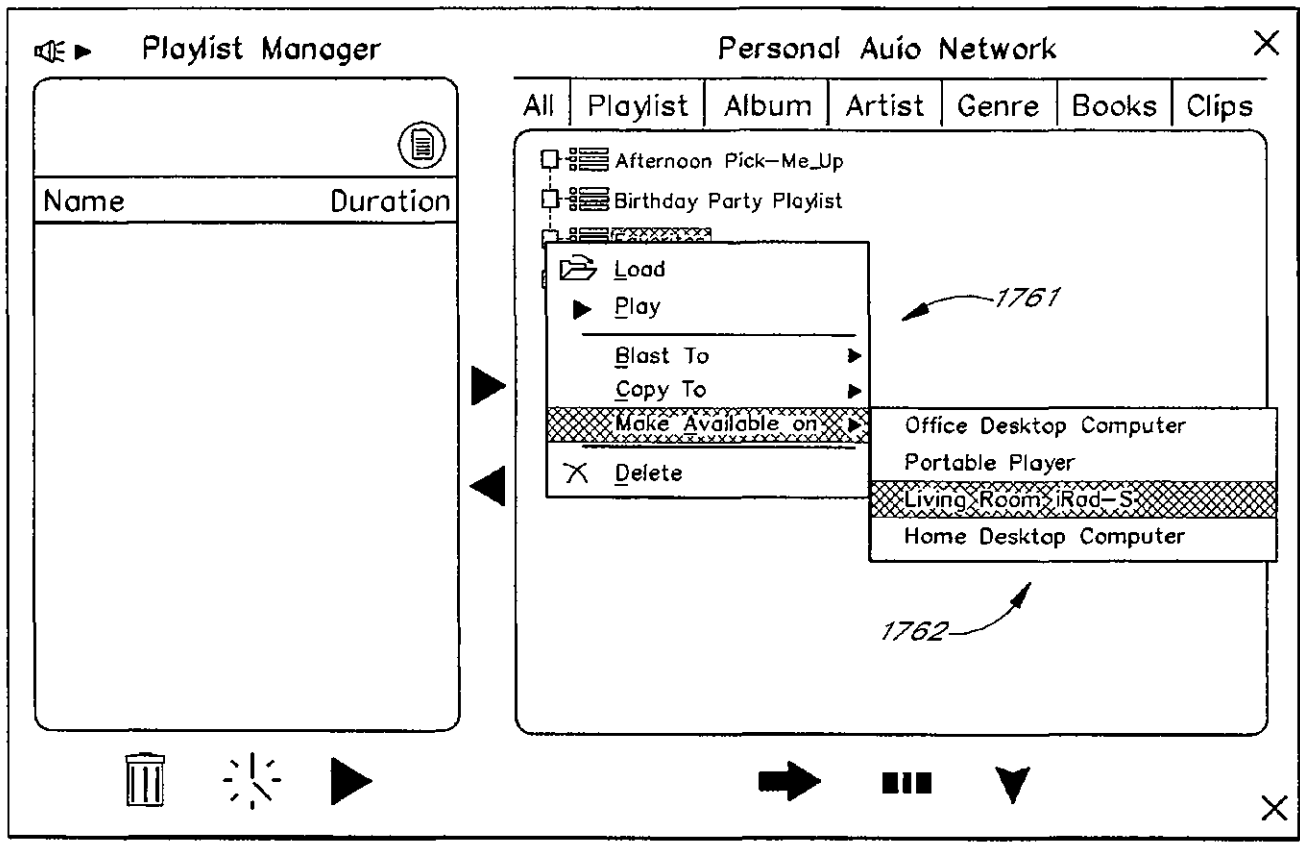


FIG. 17B



1700 →

FIG. 17C

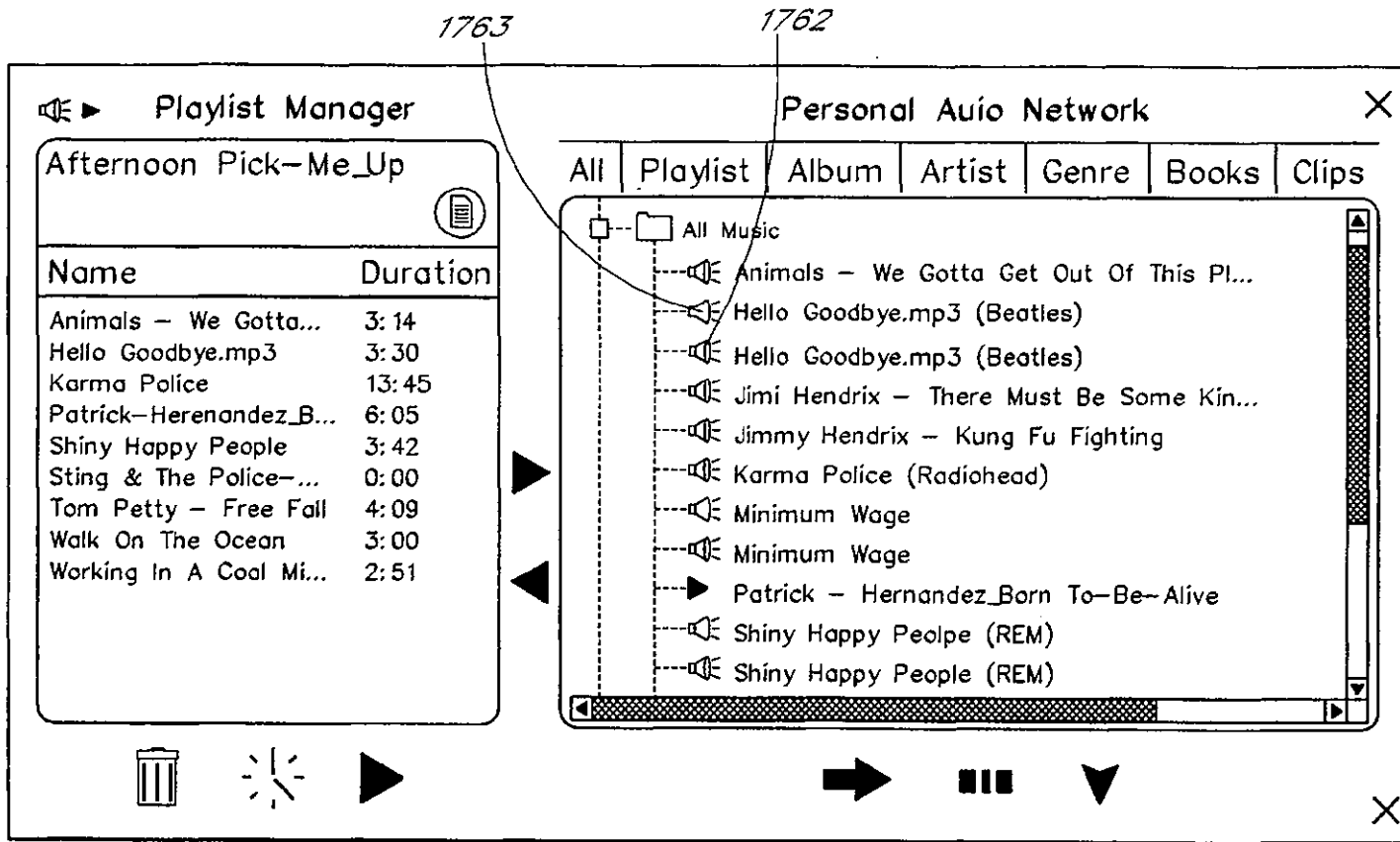


FIG. 17D

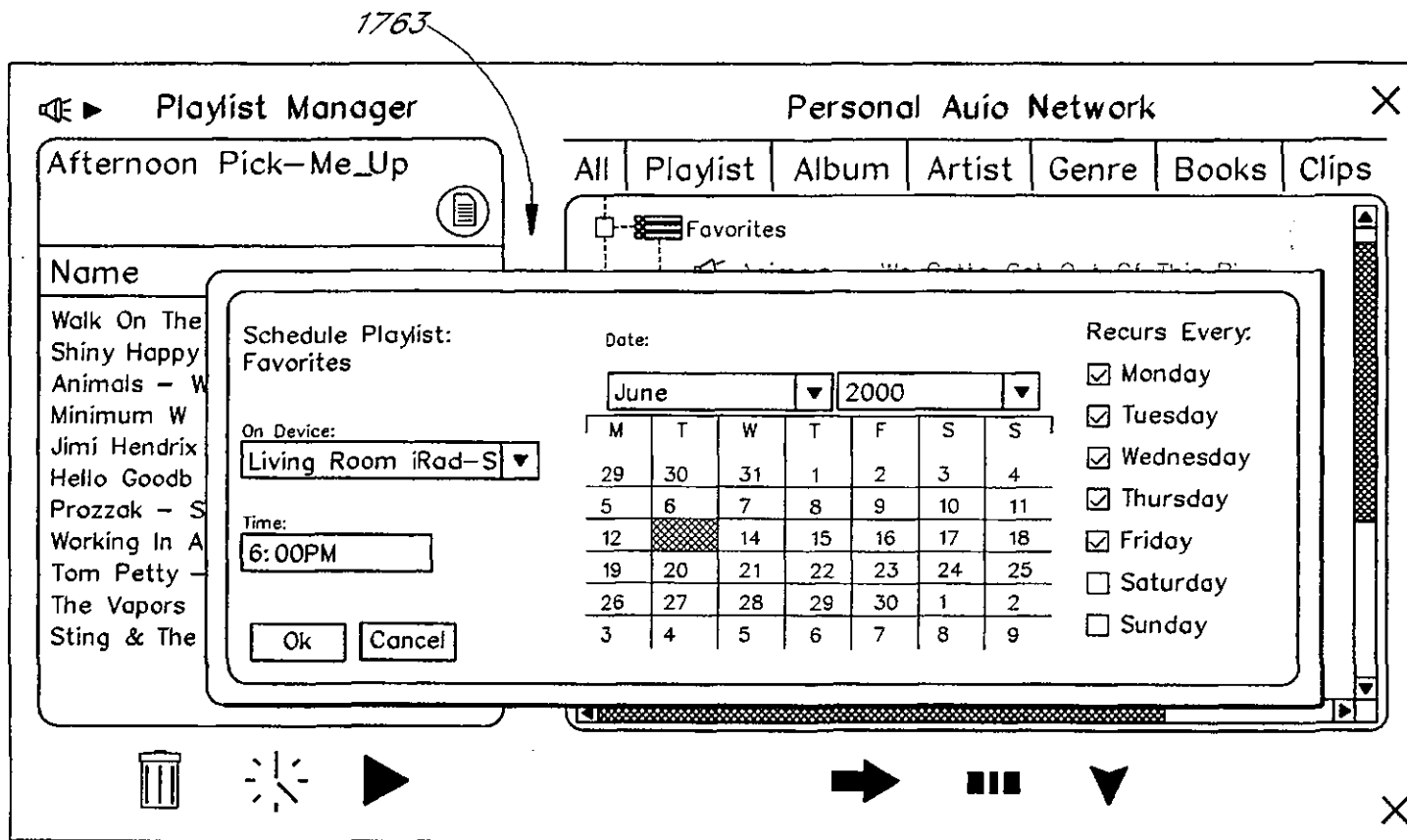


FIG. 17E

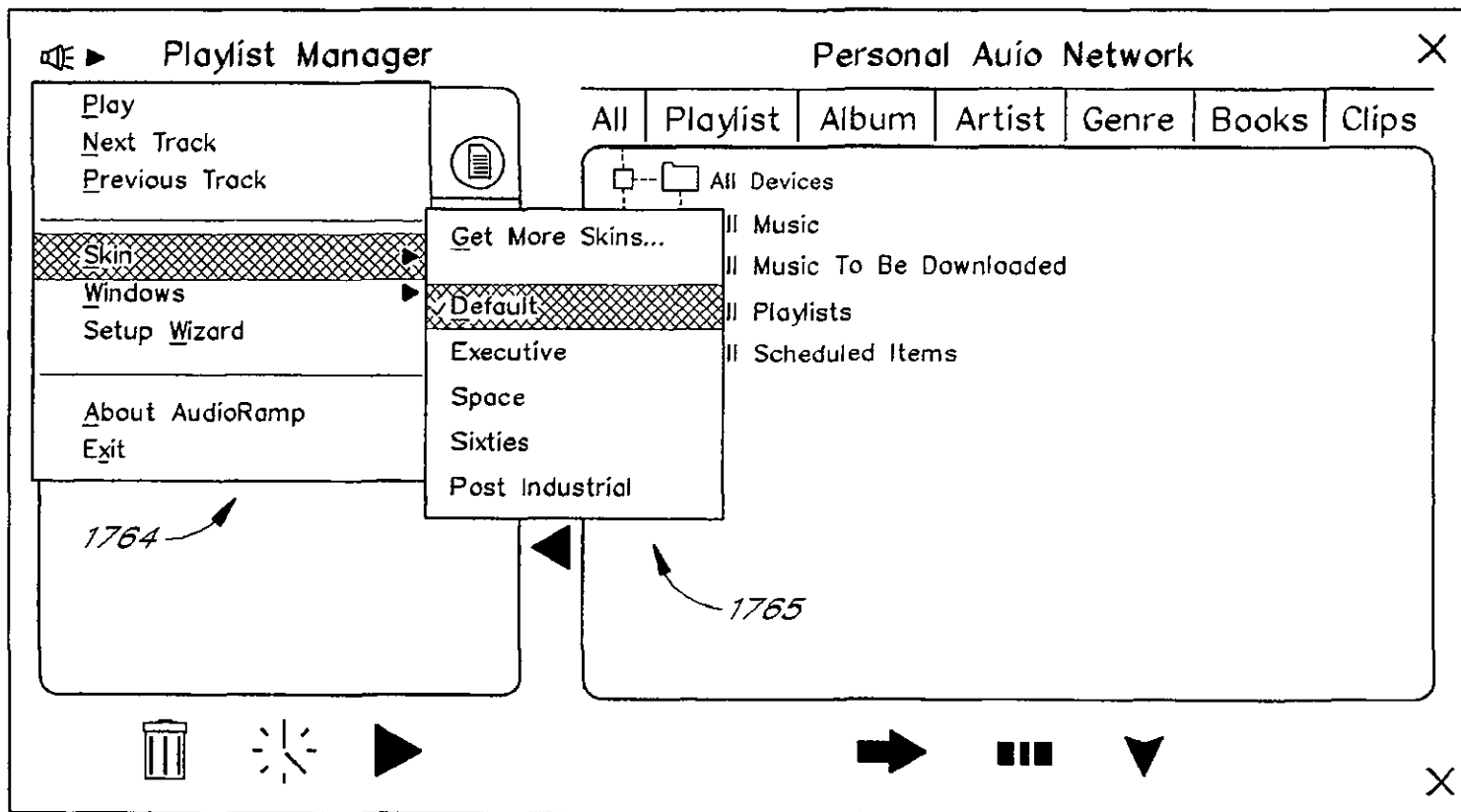


FIG. 17F

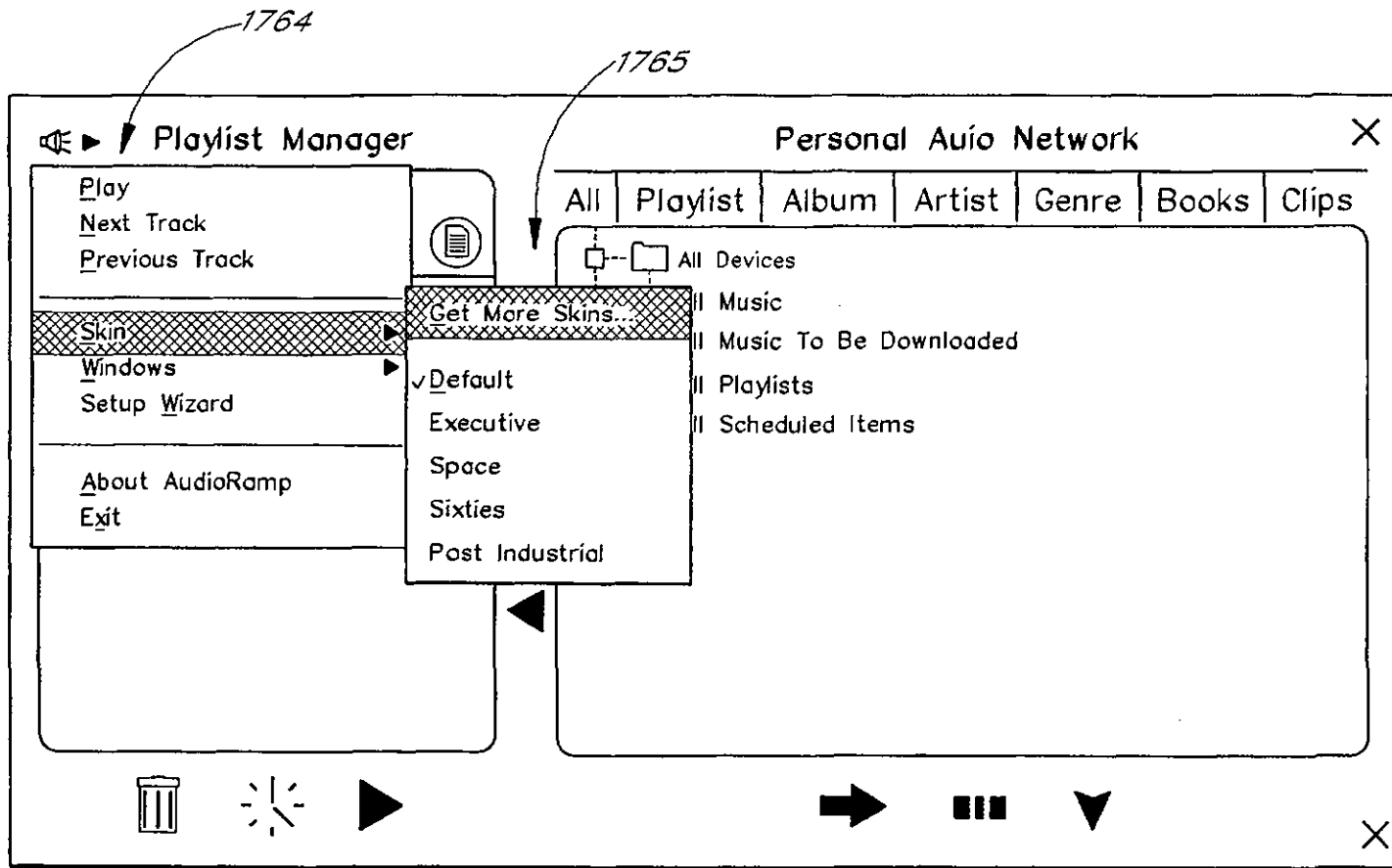


FIG. 17G

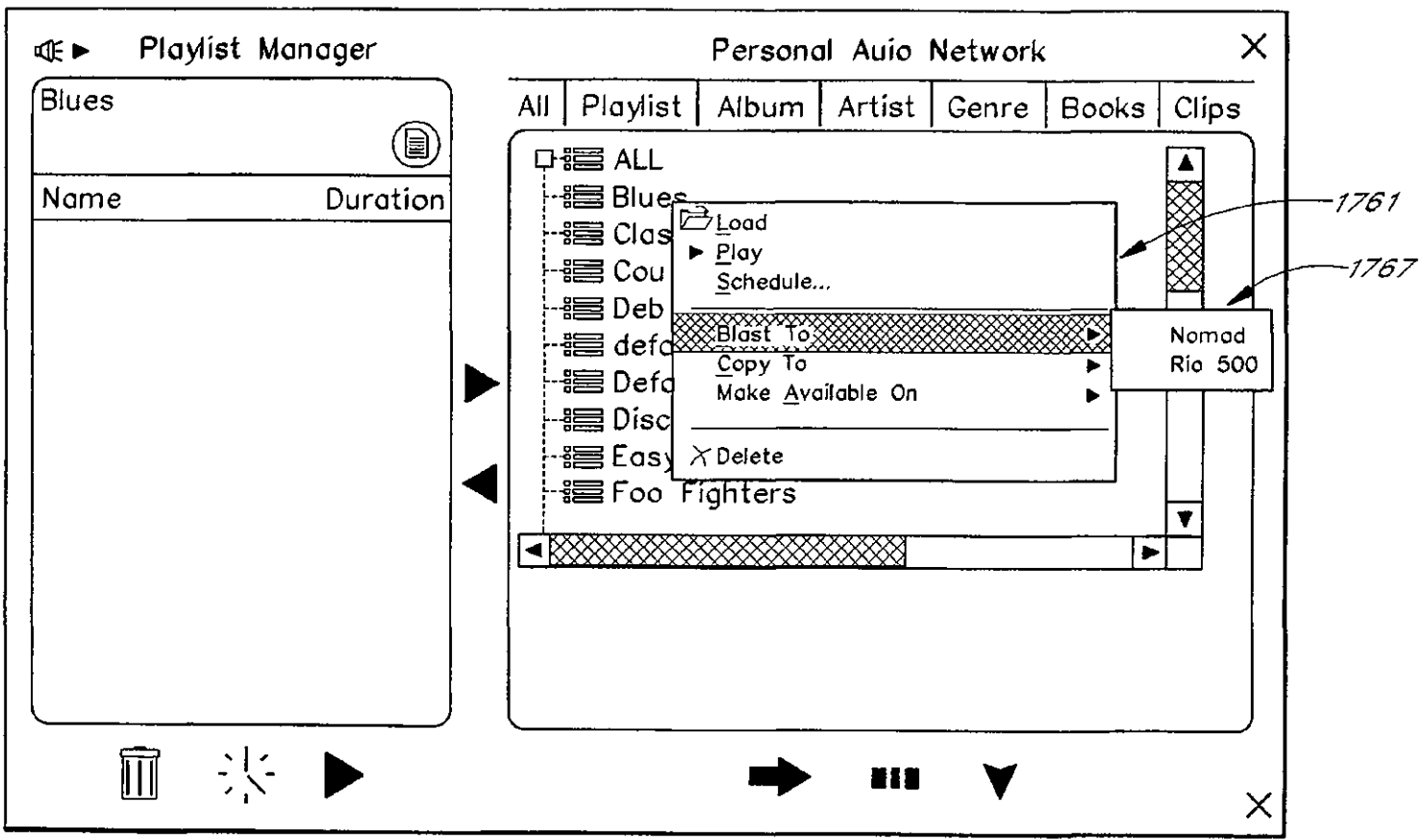


FIG. 17H

1793

1793

1771

1772

1773

1774

1775

1776

1778

1791

1792

Name Portable Player

Serial Number

Device Type Diamond Rio PMP500

Connected To My Personal Computer

Download to this device by default

Download Time 1:00 AM

Download Duration 1.00

Download Folder C:\audio

Ok Cancel

FIG. 171



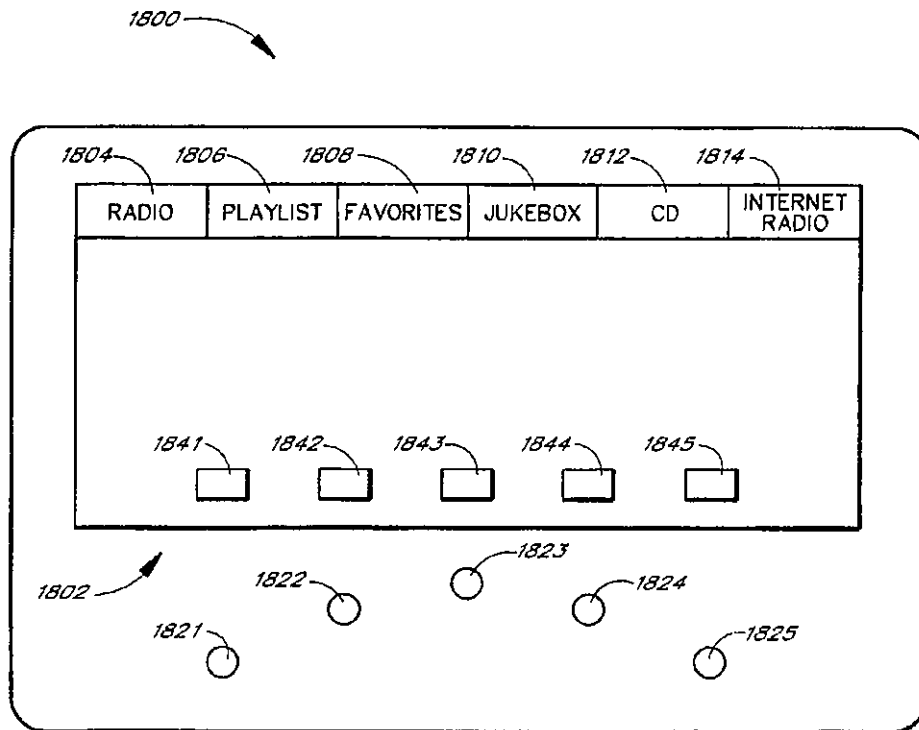


FIG. 18A

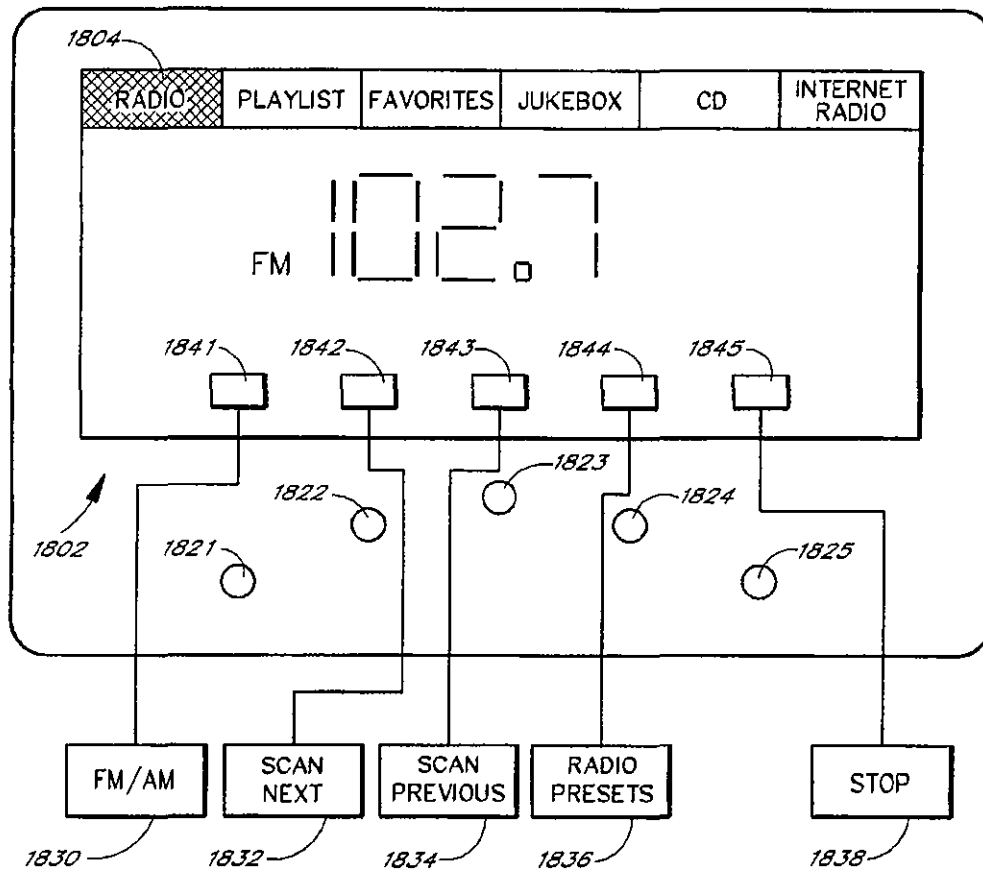


FIG. 18B

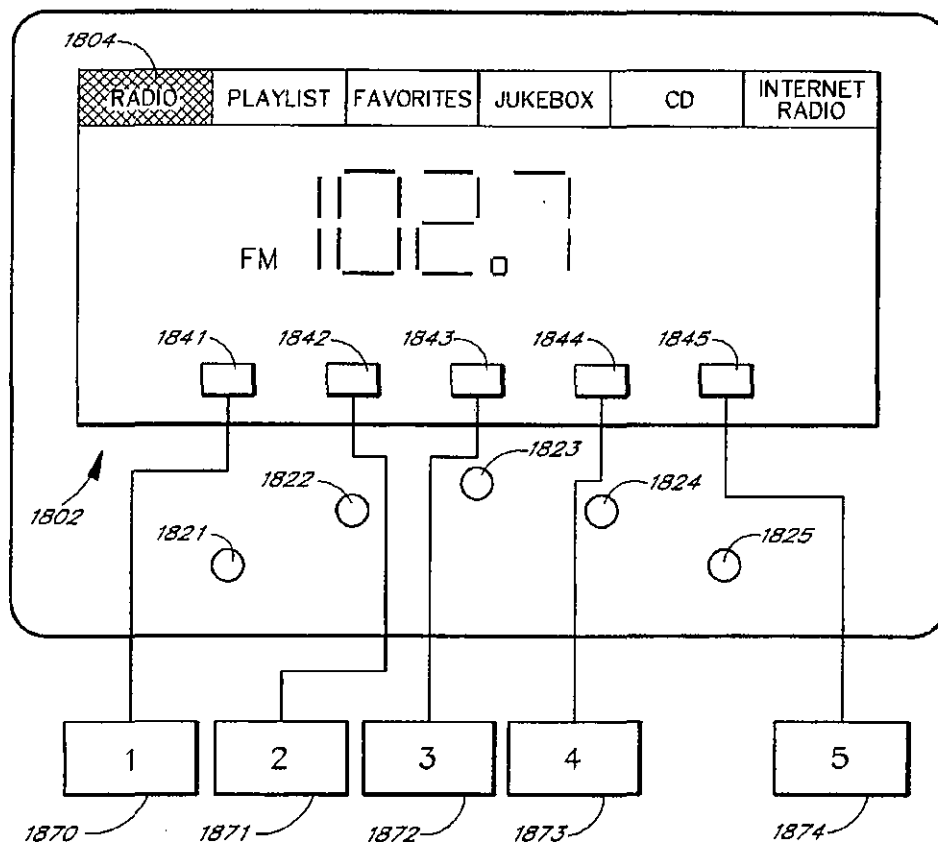


FIG. 18C

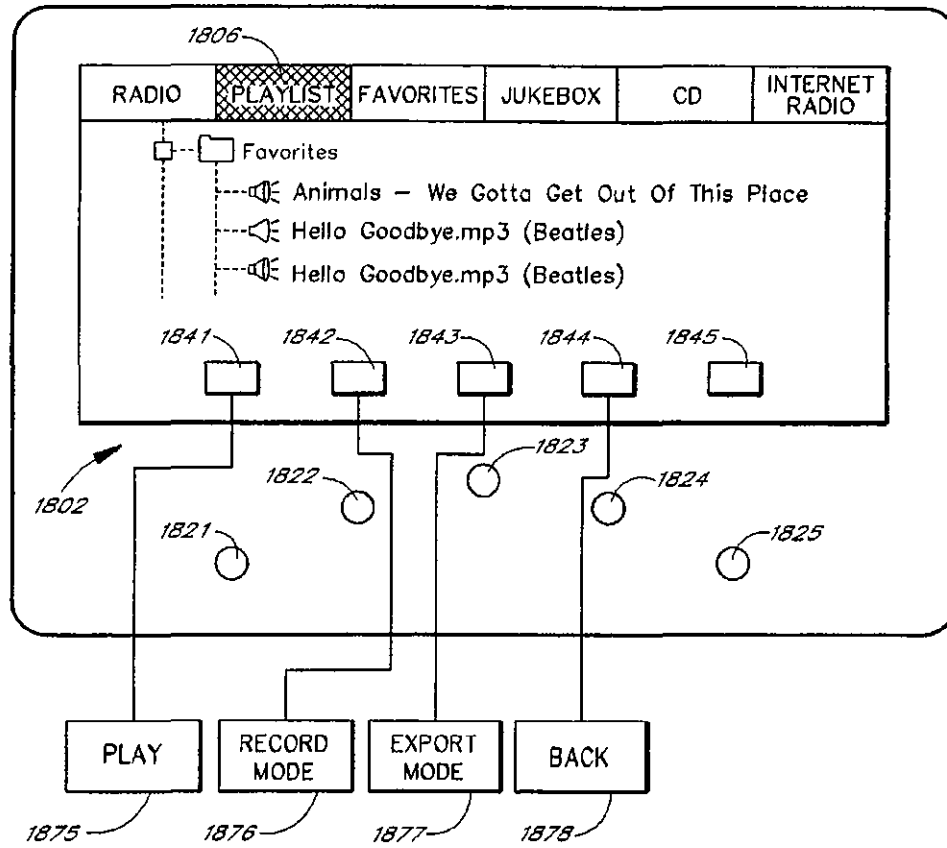


FIG. 18D

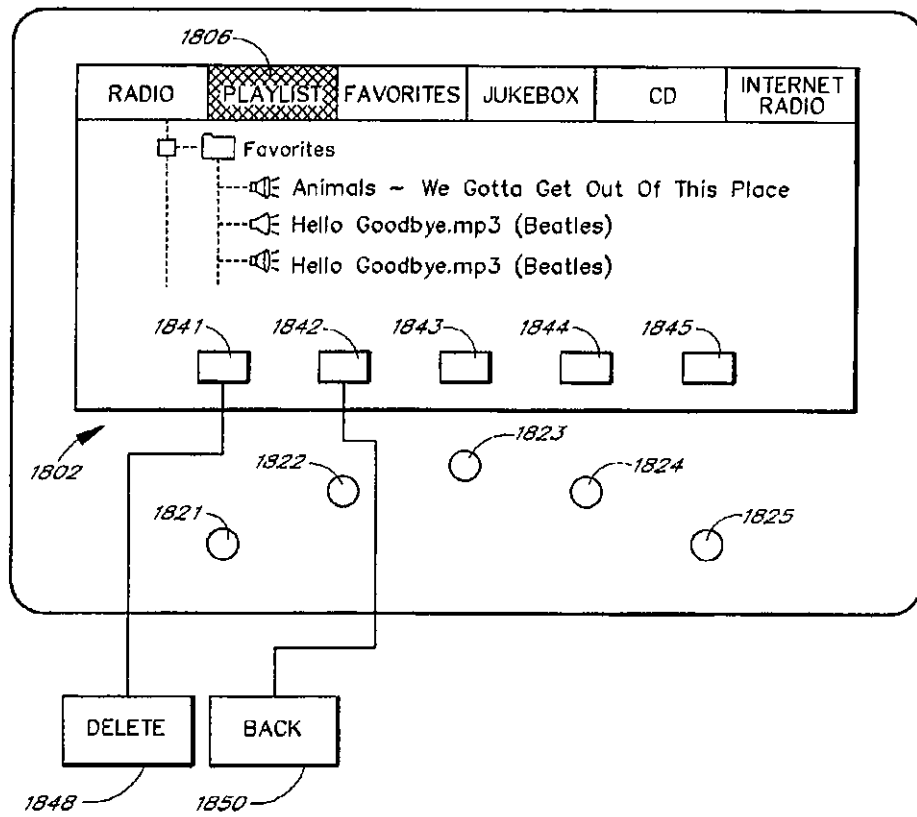


FIG. 18E

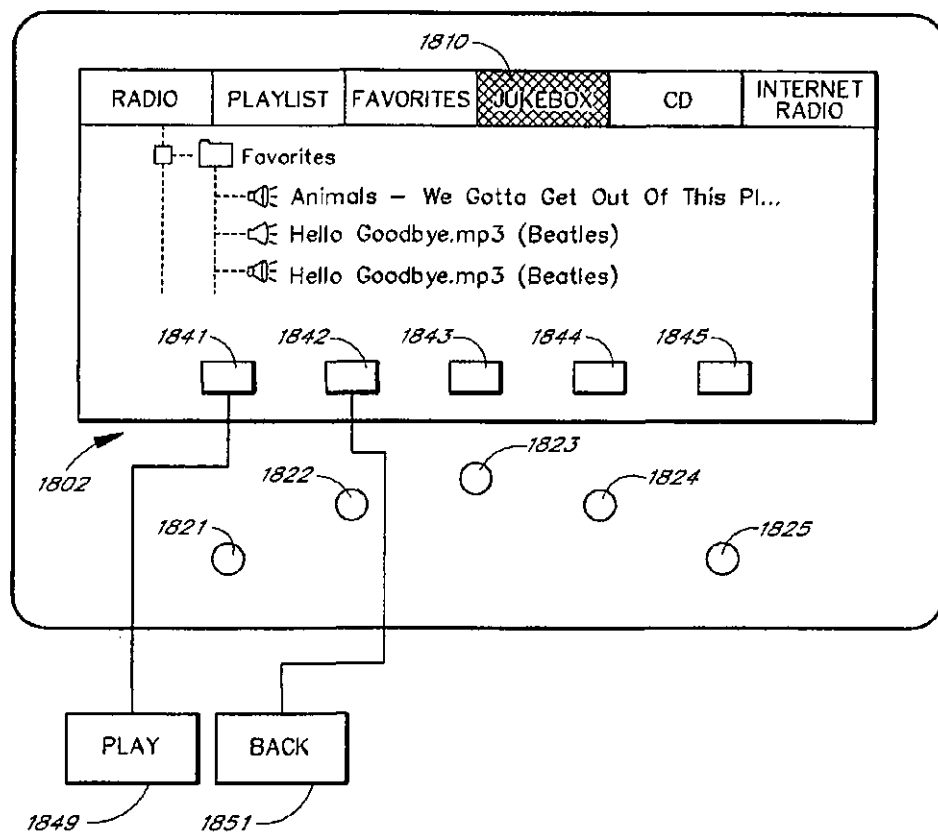


FIG. 18F

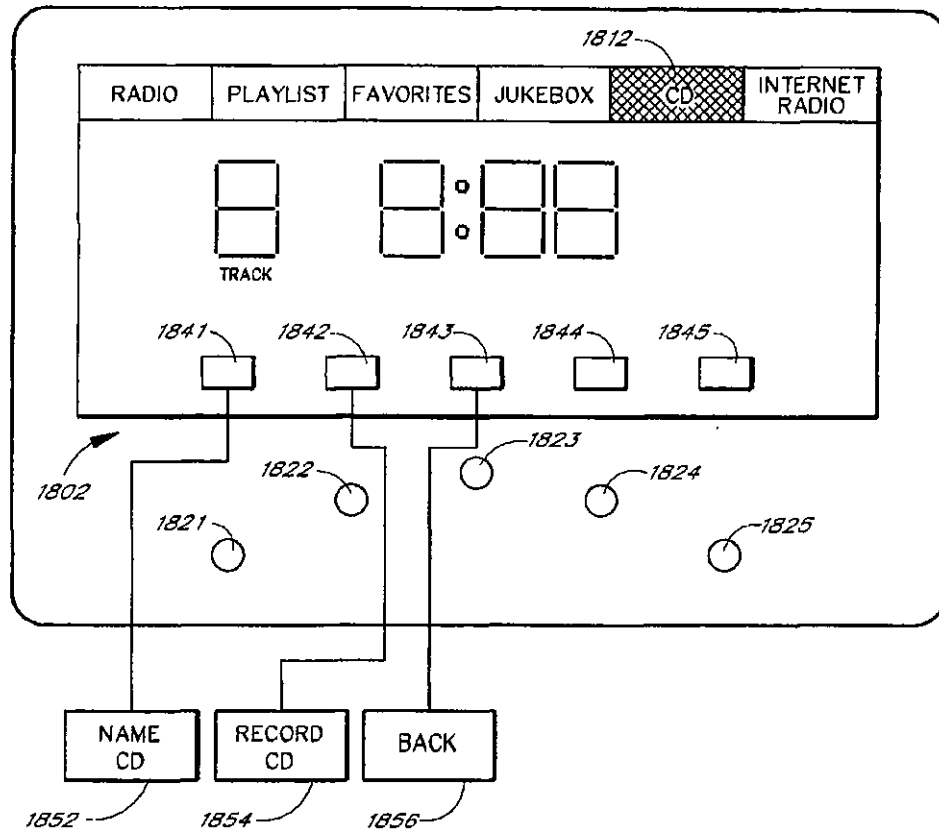


FIG. 18G

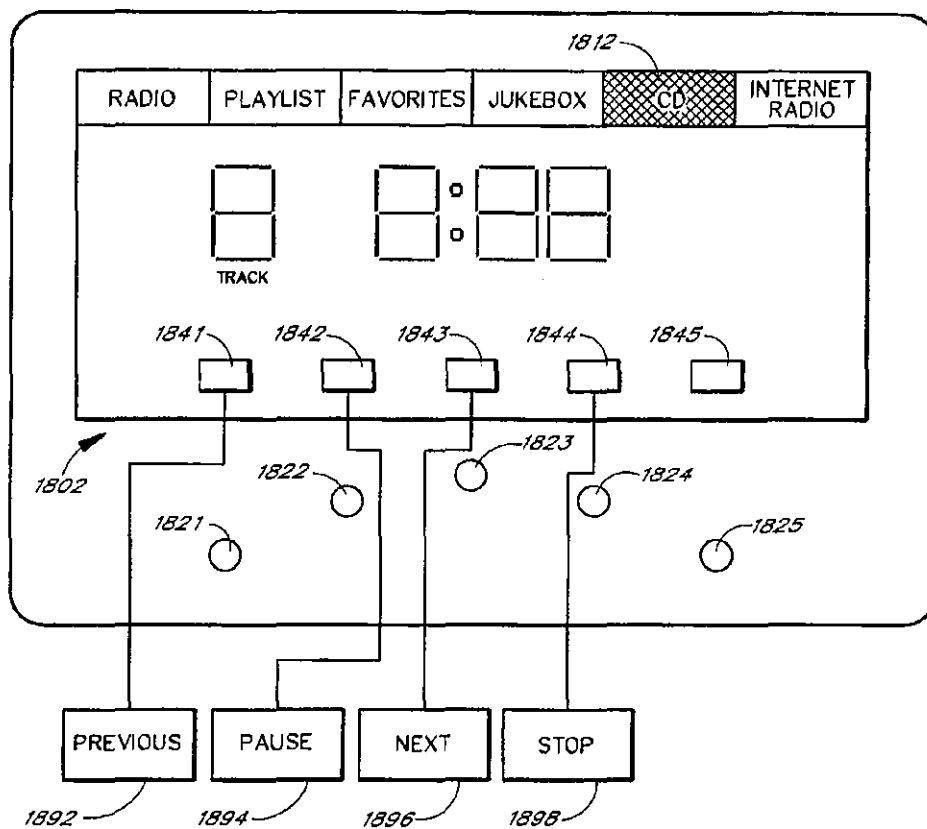


FIG. 18H



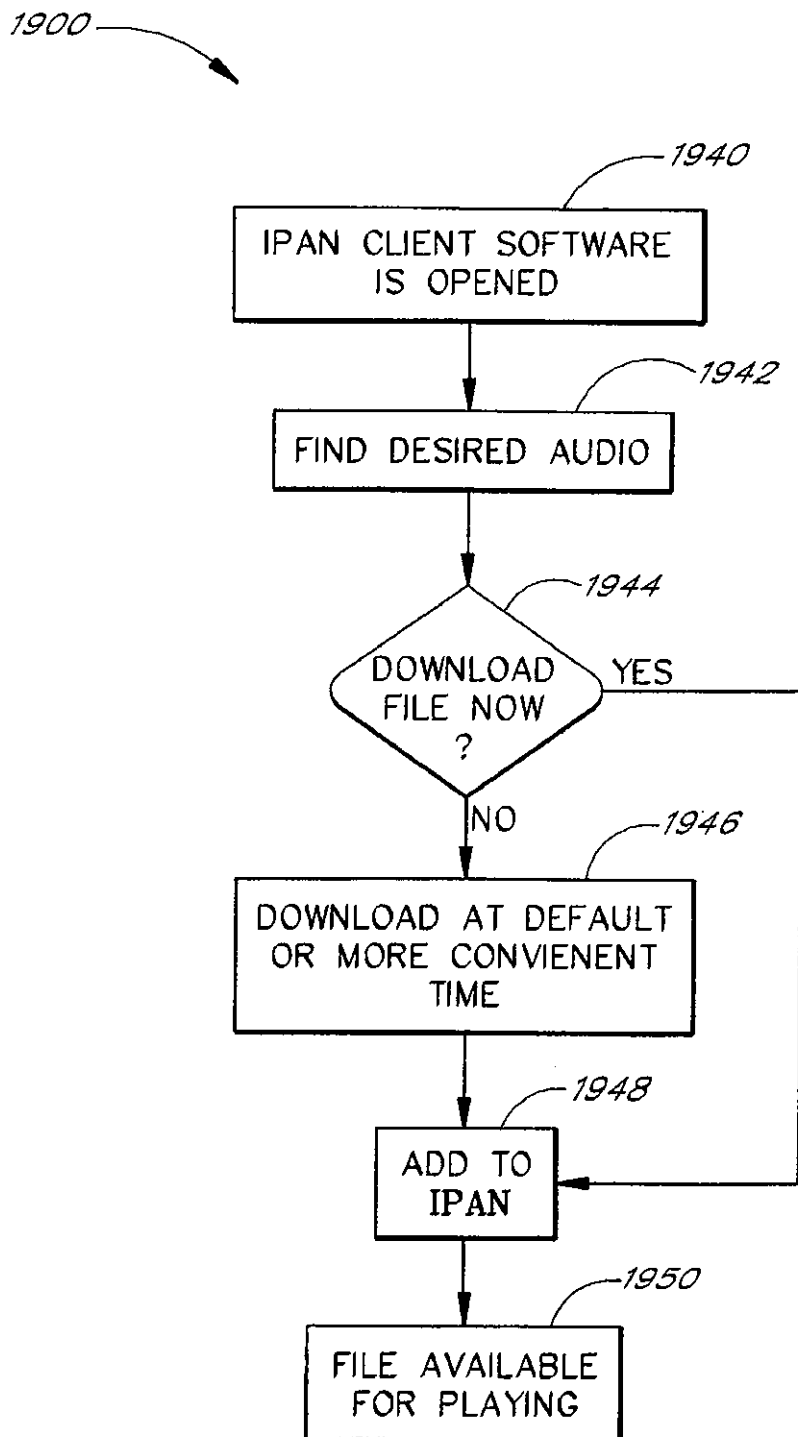


FIG. 19A

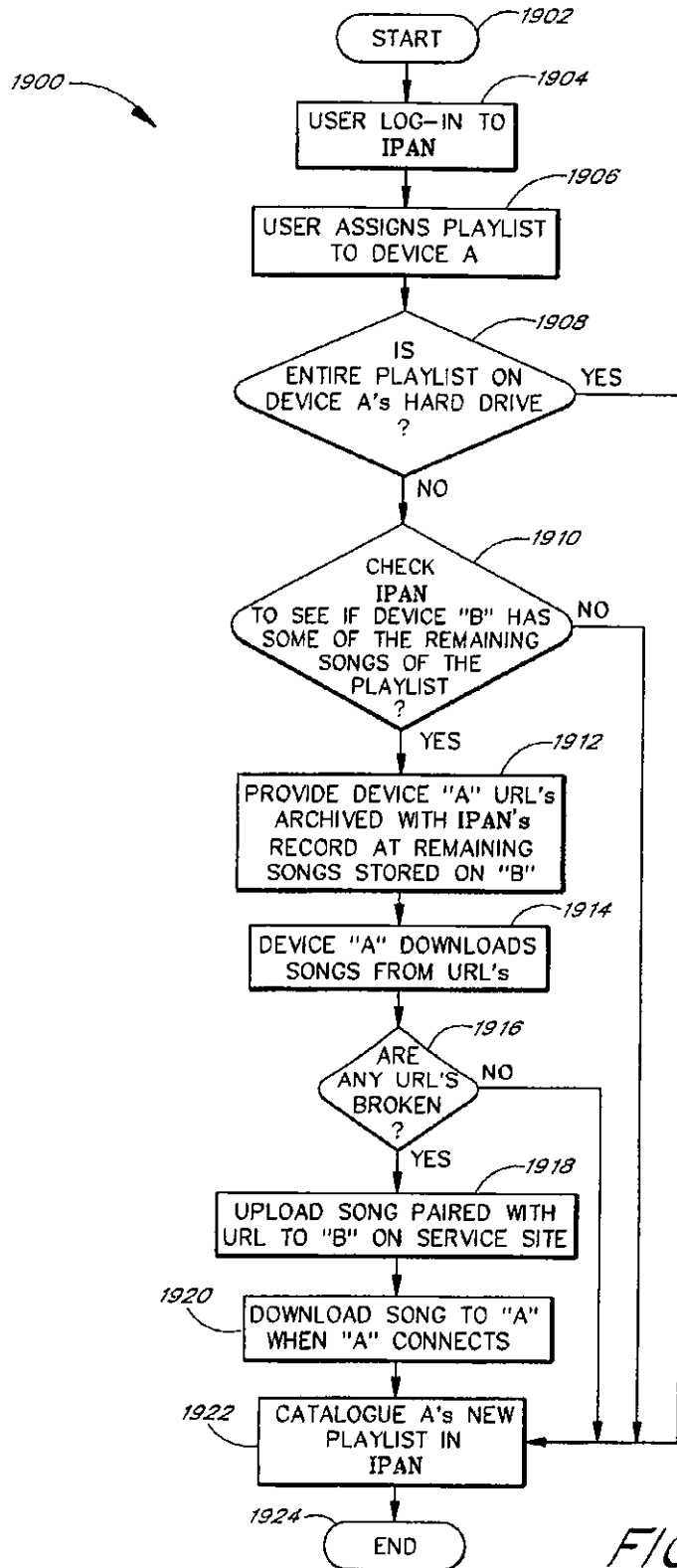
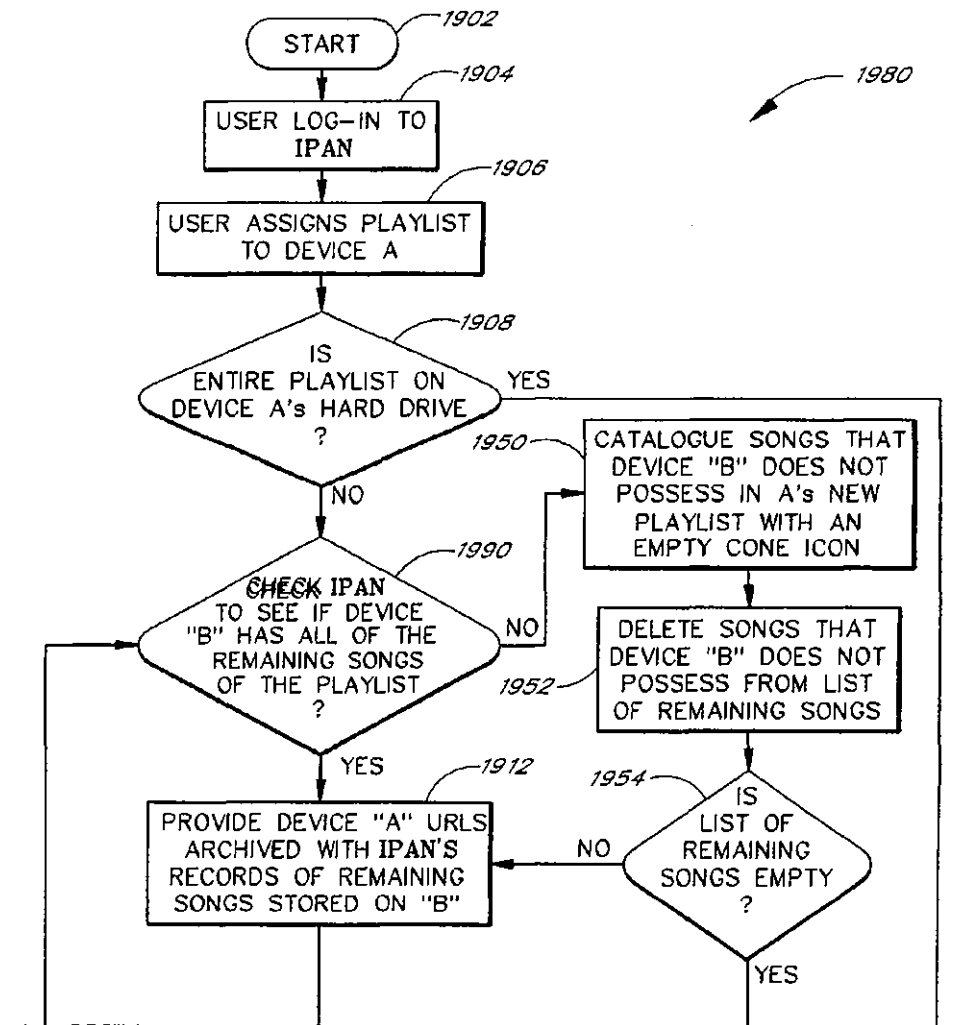


FIG. 19B



FIG. 19C

FIG. 19C<sub>1</sub>



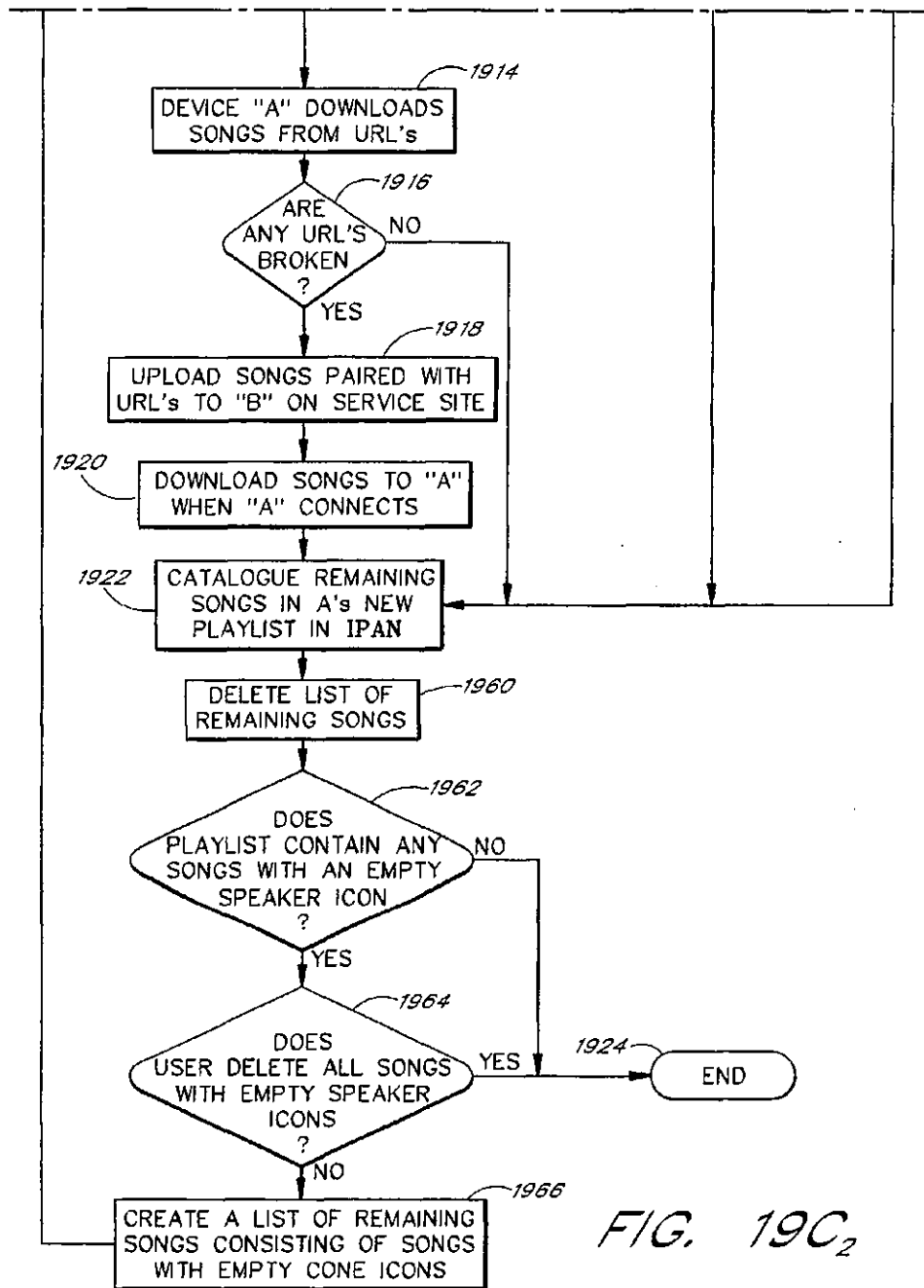


FIG. 19C<sub>2</sub>

1802

Unknown  
MP3  
02:58 / 05:43  
Pause Next Previous Add Favorites Stop



FIG. 20A

1802

Porcelain

Moby, Play

MP3

**Action**

News Music Tour Offers Done

2002

- 1821
- 1822
- 1823
- 1824
- 1825

FIG. 20B

1802

Porcelain

Moby, Play

Action<sup>2004</sup>

# Music<sup>2002</sup>

Albums   Similar   Samples   Back   Done

- 1821
- 1822
- 1823
- 1824
- 1825

FIG. 20C

1802 →

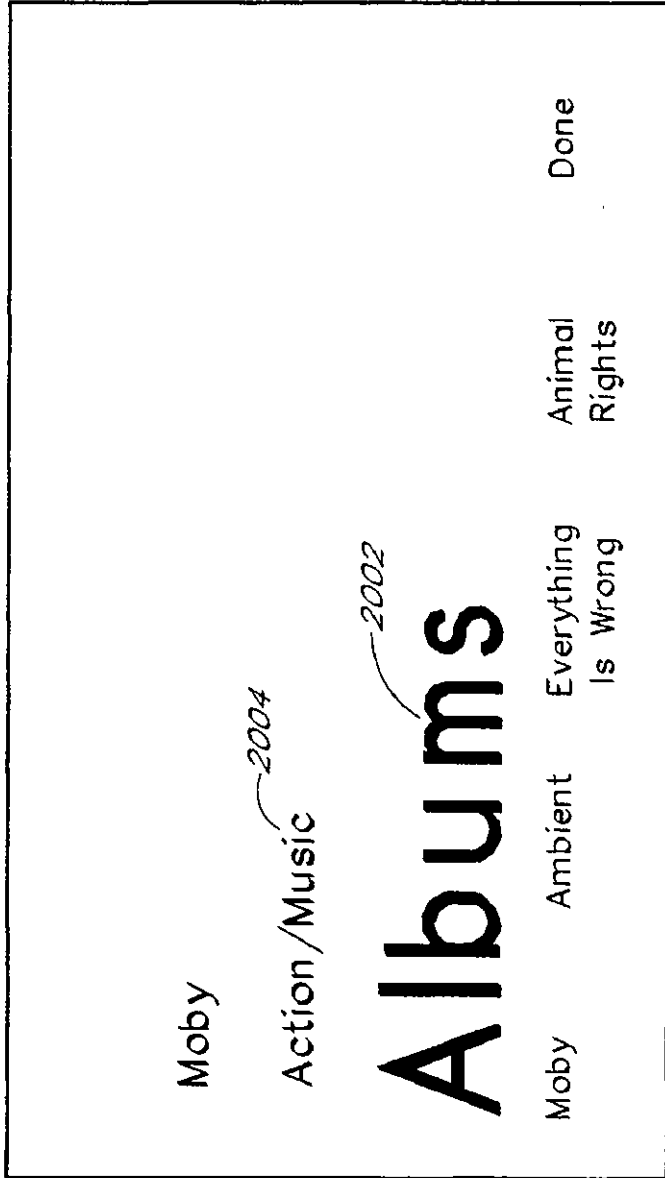


FIG. 20D



1802

Moby

Action / Music / Albums <sup>2004</sup>

**Ambient** <sup>2002</sup>

Buy    Download    Listen    Back    Done

- 1821
- 1822
- 1823
- 1824
- 1825

FIG. 20E

1802

Moby, Ambient

Action/Music/Albums/Buy <sup>2004</sup>

**Complete** <sup>2002</sup>

Buy Back Done

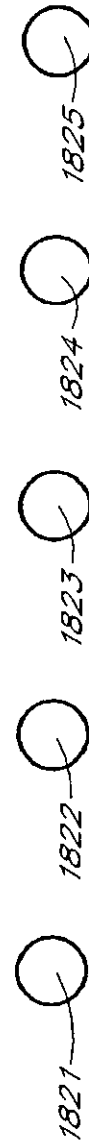


FIG. 20F

1802

Nike

Radio Free Sydney, Air Max Knukini Offer

MP3

# Action

Buy      Log to MyActions      More Info      Offers      Done

2002

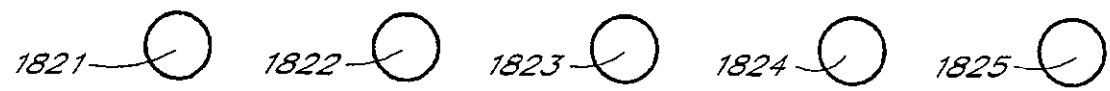


FIG. 21

1

## METHOD AND DEVICE FOR OBTAINING PLAYLIST CONTENT OVER A NETWORK

### RELATED APPLICATIONS

The present application is a continuation of U.S. patent application Ser. No. 09/805,470, filed Mar. 12, 2001, which is a continuation-in-part of U.S. patent application Ser. No. 09/096,703, filed Jun. 12, 1998, now abandoned, and which claims the benefit of U.S. Provisional Application No. 60/246,842, filed Nov. 8, 2000. U.S. patent application Ser. No. 09/096,703 also claims the benefit of U.S. Provisional Patent Application No. 60/072,127, filed Jan. 22, 1998. The disclosures of these previous applications are hereby incorporated by reference in their entireties.

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to the field of audio file transfers and, more particularly, relates to the field of management and distribution of audio files over a computer network such as the Internet.

#### 2. Description of the Related Art

The Internet is a worldwide array of interconnected computers and information servers that allow anyone with a computer and access to the Internet to get information about virtually any subject 24 hours a day. For the average consumer, an Internet Service Provider (ISP) provides access to the Internet. ISPs such as CompuServe, Prodigy, and America On-Line, currently link over ten million users to the Internet. Users typically connect to the ISP by using standard telephone lines and a telephone modem. Cable modems that allow a user to connect to the ISP over cable television lines, and satellite connections to the Internet, are also available.

The Internet provides a wealth of information from stock reports to headline news. One of the newer services provided on the Internet is a streaming audio (e.g., RealAudio and MPEG audio) service. Streaming audio services are often provided in connection with the World Wide Web (Web) and thus are often called Web radio broadcasts. With streaming audio, a user with a Personal Computer (PC), a sound card, and the necessary software can listen to audio programs from anywhere in the world. For example, Radio Prague provides daily Internet broadcasts from the Czech Republic. Listeners in the U.S. can listen to these Web radio broadcasts either in real time, or stored for later replay. Thus, unlike more traditional radio broadcasts where the listener must be within a reception area, Web radio broadcasts can be heard anywhere, so long as the listener has a connection to the Internet and the necessary computer hardware and software.

Unfortunately, even with the ever-decreasing cost of personal computers, the hardware and software needed to listen to a Web radio broadcast is beyond the financial means of many people. Even for those that can afford a personal computer, listening to a Web radio broadcast ties up the computer so that the user cannot use it for other purposes. Moreover, the use of a personal computer to receive streaming audio (e.g., Web radio broadcasts) requires a certain amount of computer literacy on the part of the user. The user must be able to install the Web Radio software, configure the Web Radio software to communicate with the ISP, and find the various Web radio broadcasts provided on the Web.

In addition to listening to Web radio broadcasts, users may wish to listen to audio files. With a group of PC's in a home and in a network, users can download songs from one PC to another or upload songs from one PC to another. However,

2

users cannot play a song on one PC by using the controls of another PC. In addition, the users must purchase multiple PC's, which can be costly. Further, the user must be able to install the network connection and the appropriate software. Moreover, even if the user can afford to purchase multiple PC's and install the proper connection, the user would have difficulty playing music in addition to performing other tasks on the PC. For example, the Web radio broadcast may be interrupted. Also, a skip over parts of a song may result if the user is using a word processing program at the same time as listening to music.

### SUMMARY OF THE INVENTION

The present invention solves these and other problems by providing a network-enabled audio device for listening to a variety of audio sources with substantially equal convenience. The network-enabled audio device has a visual display for providing audio source choices to a user. The visual display also provides functions for managing audio sources. User control buttons allow a user to choose an audio source to listen to. The menu buttons allow the user to choose functions for managing the audio sources. In one embodiment, there is also tuner circuitry for receiving radio frequency signals from radio broadcast stations. In one embodiment, a CD player allows the user to listen to CD's. In one embodiment, the network-enabled audio device also has one or more audio amplifiers and one or more loudspeakers operably connected to said audio amplifiers. In one embodiment, a modem is used for transmitting and receiving digital data over a communications network. One embodiment includes a data storage device.

A first software module is stored on the data storage device, and the software module is configured to decode compressed audio files into a playable (e.g. uncompressed) format. A second software module is also stored on the data storage device. The second software module is configured to use the modem to connect to an Internet service provider to receive assignments of playlists from a third software module. The playlists include references to audio from a variety of audio sources. The assignments provide information about the location of other web sites containing the audio sources. The second software module is configured to subsequently connect through an Internet service provider to web sites to download audio files.

A third software module is also stored on the data storage device. The third software module is configured to use the modem to connect to an Internet service provider to receive digitized audio broadcasts from the Internet service provider. The module is further configured to provide a select-broadcast display to allow the user to selectably connect a program broadcast to the input of one or more audio amplifiers either from a local AM or FM radio station or from the world wide Web so that, to the user, reception of a broadcast from the World Wide Web is no more complicated than listening to a local FM or AM radio station.

One aspect of the present invention is a network-enabled audio device that allows a user to store files, to play standard audio CD's, to play MP3 encoded CDs, to record songs from CD's, to receive digitized radio broadcasts over the World Wide Web (Web), and to receive assignments of playlists of songs from other network-enabled audio devices. The network-enabled audio device provides the hardware and software to perform those functions without the need for expensive equipment. Optionally, a Local Area Network can be configured in place of, or in addition to, the Internet connection to facilitate assignments of playlists and other features.

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Without an Internet connection or other network connection, the network-enabled audio device can play standard audio CD's, can play MP3 encoded CD's, and can record CD's.

The network-enabled audio device provides a display device, such as a Liquid Crystal Display (LCD) that allows the user to select playlists of music much like a jukebox. The user can compose playlists from disk files, CD's, Internet streaming audio broadcasts, online music sites, and other audio sources. In one embodiment, the user can also compose playlists from links to AM/FM broadcasts. The user can also select a desired Web broadcast from a list of available Web broadcasts. In addition, the user can play standard audio CD's and MP3 encoded CD's and have access to local AM/FM stations. Further, the software, the user controls, and the display in the network-enabled audio device are operably configured and connected such that the user can listen to playlists that include CD's and other audio sources just as the user would choose a playlist in a jukebox. Thus, the network-enabled audio device provides people who are or are not comfortable with computers a way of taking music from various sources and putting it into one place for listening pleasure. In one embodiment, the Personal Computer (PC) is used to compose the playlists, but the user is able to listen to playlists and other audio sources without using the PC.

In one embodiment, the network-enabled audio device is a low-cost tabletop box that connects to an AC power line and optionally to a phone line or to a local area network connection such as Ethernet. The device includes a display device, speakers, a control panel, a computer processor, stored software, a modem, an AM/FM tuner, and a CD player. Optionally, the device can include multiple computer processors or support computer processors. The user accesses the server site via a PC and the Internet. From the server site, the user obtains a list of the devices in his or her Internet Personal Audio Network (IPAN) and what songs are on those devices. The IPAN includes an IPAN server, an IPAN client, and IPAN software stored on the network-enabled audio device. In one embodiment, the IPAN client includes a standard web browser, an IPAN plug-in to the standard web browser, and an IPAN active tray software module. In one embodiment, any standard web browser may be used, but the IPAN client includes the IPAN plug-in and the IPAN active tray software module.

The IPAN client and the IPAN server store the name of the song and the associated Uniform Resource Locator (URL). The user can list multiple devices as being part of his or her IPAN. At a default time, such as for example 2 a.m., each device establishes a connection to an Internet Service Provider (ISP). The stored software module in each device connects to the server site home page, via the ISP, and inquires whether any songs or playlists have been assigned to the device. The user can bypass the default time for accessing the server and access the server by manually pressing one of the buttons.

In one embodiment, the network-enabled audio device has no disk for data storage space. Rather, a local area network (LAN) connection to a PC or other network-enabled audio device allows the use of disk space on another device. In one embodiment, the network-enabled audio device comprises speakers, an AC power line, and a network line. A home PC is connected to the network-enabled audio device through the network line. The network connection can be a Home Phone-line Networking Alliance (HPNA) network connection so that the connection may be done through existing phone lines in a home. Optionally, the network connection can be an

4

Ethernet connection. Multiple network-enabled audio devices can be connected to each other and ultimately to the PC through the network line.

In one embodiment, the network-enabled audio device does not have any storage space other than memory. This embodiment provides for a low-cost system that can play songs from playlists stored on the IPAN Manager or on the PC's storage space without having to store the audio files locally.

Another aspect of the present invention is a network-enabled component audio device system for listening to a variety of audio sources with substantially equal convenience. A visual display provides audio source choices to a user. The visual display also provides menu choices for managing audio sources to the user. The user control buttons allow the user to choose an audio source to listen to. The menu buttons allow the user to choose functions for managing the audio sources. The network-enabled component audio device has a CD player for listening to compact discs. A modem is used for transmitting and receiving digital data over a communications network. In one embodiment, a data storage device is provided.

A first software module is configured to decode compressed audio files. The first software module is stored on the data storage device. A second software module is configured to use the modem to connect to an Internet service provider to receive assignments of playlists from the second software module. The playlists include titles of audio from a variety of audio sources. The assignments provide information about the location of other web sites containing the audio sources. The software module is configured to connect through the ISP to the web sites to download the audio files.

In one embodiment, the network-enabled audio device is a component hardware device for an audio system. The network-enabled audio device provides an audio output to the audio system. The audio system provides amplifiers and loudspeakers. The network-enabled audio device includes an enclosure that connects to an AC power line, a network line, and the audio system. The network line is a computer data connection, such as, for example, a telephone line, a cable line, an Ethernet line, a Token-Ring line, a twisted pair line, an infrared link, a radio frequency link, an IEEE 1394 FireWire line, etc. The network-enabled audio device includes a display device, a control panel, at least one computer processor, a stored software module, and a modem. In one embodiment, the network-enabled audio device connects to the IPAN server site.

Another aspect of the present invention is a method for assigning playlists of music from one electronic device to another. First, a network connection is used for transmitting and receiving digital data over a communication network to an Internet service provider. Next, the process provides a first software module to manage playlists of songs. The software module allows a user to compose playlists from a variety of audio sources. The software module allows a user to assign a playlist from a first device to a second device. Next, the process checks the second device's data storage space for songs listed on the assigned playlist. Next, the process accesses a server site to obtain locations of the web sites the first device downloaded its audio files from. The process then provides a second software module to connect to various web sites to download remaining songs needed for the playlist. The second software module connects if songs needed to form the playlist are not stored on the second device's data storage space. Finally, the process uploads files to the server

from the first device and downloads files the second device if the second software module is unable to download a file from said web site.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The various novel features of the invention are illustrated in the figures listed below and described in the detailed description that follows.

FIG. 1 is a perspective view of one embodiment of a tabletop intelligent radio apparatus.

FIG. 2 is a block diagram of the functional elements of the intelligent radio apparatus.

FIG. 3A shows a default display that appears while a Web broadcast is being received.

FIG. 3B shows a menu display that allows the user to select one of the command and setup displays shown in FIGS. 3C-3E.

FIG. 3C illustrates a select language display that allows a user to specify desired languages (e.g., English, French, etc.).

FIG. 3D illustrates a display that allows a user to select a type of program material (e.g., news, sports, weather, etc.).

FIG. 3E illustrates a display that allows a user to select various program broadcasts.

FIG. 4 illustrates a data-entry display that the intelligent radio apparatus uses to allow the user to input alphanumeric text.

FIG. 5 is a flowchart that illustrates operation of the intelligent radio apparatus.

FIG. 6 is a flow graph that illustrates operation of the intelligent radio networked system.

FIG. 6A illustrates the information management and data processing functions provided by a Web radio Web site (e.g., www.webradio.com) to produce a list of Web radio broadcast stations for the user.

FIG. 6B illustrates a relationship between the Web radio Web site and other web sites that provide streaming audio programming.

FIG. 7 is a perspective view of a tabletop intelligent radio tuner.

FIG. 8 is a block diagram of the functional elements of the intelligent radio tuner shown in FIG. 7.

FIG. 9 is a block diagram of the functional elements of an embodiment of the intelligent radio that provides a remote playback capability.

FIG. 10 is a block diagram of the functional elements of an embodiment of the intelligent radio that provides a remote access capability.

FIG. 11 is a perspective view of one embodiment of the computing environment of a network-enabled audio device configuration.

FIG. 12A is a perspective front view of one embodiment of the network enabled component audio device as shown in FIG. 11 that integrates with a home stereo entertainment system.

FIG. 12B is a perspective rear view of one embodiment of the network-enabled component audio device as shown in FIG. 11 that integrates with a home stereo entertainment system.

FIG. 13A is a perspective front view of one embodiment of a stand alone network-enabled audio device as shown in FIG. 11.

FIG. 13B is a perspective rear view of one embodiment of a stand alone network-enabled audio device as shown in FIG. 11.

FIG. 14 is a block diagram of the functional elements of the network-enabled audio device as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 15 is a block diagram illustrating the configuration between several network-enabled audio devices and a stereo web site as shown in FIG. 11.

FIG. 16 illustrates a process for connecting the components and setting up the software for the network-enabled audio device as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 17A shows a default display of the current playlists when the Internet Personal Area network (IPAN) manager software is started.

FIG. 17B illustrates a display that allows the user to control the sound and perform other functions on the audio source.

FIG. 17C illustrates the menus used to assign a playlist, as shown in FIG. 17A, to another device.

FIG. 17D illustrates the songs within a playlist and links to other devices that have the songs present on their hard disk space.

FIG. 17E illustrates a schedule window that appears for a song (shown in FIG. 17D) to be played at a particular time on a specific device.

FIG. 17F illustrates the window that appears to allow the user to choose a default look and feel for the IPAN manager window, as shown in FIG. 17A.

FIG. 17G illustrates the window that appears to allow the user to choose other options and the look and feel for the IPAN manager window, as shown in FIG. 17A.

FIG. 17H illustrates the window that appears to allow the user to move audio files from one device to another device.

FIG. 17I shows a display for allowing a user to add a device to the IPAN.

FIG. 18A shows a default display of the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18B shows a display for allowing a user to operate the radio functions of the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18C shows a display for allowing a user to use preset radio stations of the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18D shows a display for allowing a user to play a playlist stored on the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18E shows a display for allowing a user to delete a song from a playlist stored on the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18F shows a display allowing a user to play the songs from all the playlists stored on the network-enabled audio device as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18G shows a display for allowing a user to collect information about a CD and copy a CD to the internal hard drive of the network-enabled audio device shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18H shows a display that allows a user to play and navigate through the audio stored on the CD.

FIG. 19A is a flowchart showing the process for downloading audio files found when navigating the Internet.

FIG. 19B is a flowchart showing the process for assigning playlists from one device to another.

FIG. 19C, which comprises FIG. 19C<sub>1</sub> and FIG. 19C<sub>2</sub>, is a flowchart of the process shown in FIG. 19B that assigns playlists with missing songs from one device to another.

FIG. 20A shows a default display of the network-enabled audio device before the action button has been pressed, as shown in FIGS. 12A, 12B, 13A, and 13B.

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FIG. 20B shows a display of the menu items on the network-enabled audio device after the action button has been pressed.

FIG. 20C shows a display of the menu items on the network-enabled audio device after the "music" menu item has been chosen.

FIG. 20D shows a display of the menu items on the network-enabled audio device after the "albums" menu item has been chosen.

FIG. 20E shows a display of the menu items on the network-enabled audio device after the menu item representing an album has been chosen.

FIG. 20F shows a display of the menu items on the network-enabled audio device after the "buy" menu item has been chosen.

FIG. 21 shows a display including an advertisement after the action button has been pressed on the network-enabled audio device.

In the figures, the first digit of any three-digit number generally indicates the number of the figure in which the element first appears. For example, an element with the reference number 502 first appears in FIG. 5. Where four-digit reference numbers are used, the first two digits indicate the figure number.

#### DETAILED DESCRIPTION

One aspect of the present invention is an intelligent radio device that allows a user to receive digitized radio broadcasts over the World Wide Web (Web). The intelligent radio provides the hardware and software necessary to receive digitized audio from the Web without the need for a personal computer or other expensive equipment. The intelligent radio provides a display device, such as a Liquid Crystal Display (LCD) that allows the user to select a desired Web broadcast from a list of available Web broadcasts. The display also allows the user to select Web broadcasts in a particular language. The software, the user controls, and the display in the intelligent radio 100 are operably configured and connected such that a user can tune into a Web radio broadcast in a manner similar to the way a user would use the controls on a conventional radio to tune into an AM or FM radio station. Thus, the intelligent radio provides people who are not comfortable with computers, or who do not own or have access to a computer, an opportunity to listen to streaming audio information from the Internet.

In one embodiment, the intelligent radio is a low-cost tabletop box that connects to an AC power line and a phone line. The device includes a display device, speakers, a control panel, a computer processor, a stored software program, and a modem. The intelligent radio uses the modem to establish a telephone connection to an Internet Service Provider (ISP). The stored software program connects to a Web Radio home page, via the ISP, and downloads a list of Web radio station addresses. Alternatively, the user can enter a web address (e.g., a Uniform Resource Locator (URL)) to connect directly to a web page that provides audio broadcasts (instead of first connecting to the Web Radio home page). The user may use buttons on the control panel to scroll through the display and select a Web radio broadcast "station" for listening. When a station is selected, the stored software program connects to the station and begins to receive digitized audio data transmitted by the station. The intelligent radio converts the received data to analog audio and plays the audio on one or more loudspeakers.

In an alternate embodiment, the intelligent radio is a tuner that connects to an audio system such as a component stereo

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system. The tuner provides an audio output to the audio system. The audio system provides amplifiers and loudspeakers. The tuner comprises an enclosure that connects to an AC power line, a network line, and the audio system. The network line may be any type of computer data connection, including, for example, a telephone line, a cable line, an Ethernet line, a Token-Ring line, a twisted pair line, an infrared link, a radio frequency link, an IEEE-1394 FireWire line, etc. The tuner includes a display device, a control panel, a computer processor, a stored software program, and a modem. The intelligent radio uses the modem to establish a telephone connection to an Internet Service Provider (ISP). The stored software program connects to a Web Radio home page, usually provided by the ISP, and downloads a list of Web radio stations. A user uses use buttons on the control panel (or remote control) to scroll through the display and select a Web radio broadcast "station" for listening. Alternatively, the user may use voice-activated commands to scroll through the display. When a station is selected, the stored software program connects to the station and begins to receive digitized audio data transmitted by the station. The intelligent radio converts the received data to analog audio, which is provided to the audio system.

FIG. 1 illustrates one embodiment of a tabletop intelligent radio 100. The intelligent radio 100 is mounted in an enclosure 101 and connects to household AC power through a power cord 104 and to a communications network by a network cable 102. The network cable 102 may be a telephone line, a network cable, a cable TV cable, a connection to a wireless (e.g., satellite) unit, etc. For example, the communications network may use Iridium satellites developed by the Motorola Corp., Globalstar satellites developed by a consortium of European manufacturers which includes Aérospatiale and Alcatel, P21 satellites developed on a project financed by Inmarsat, or the Odyssey satellite system developed by a TRW consortium associated with Teleglobe/Canada.

User controls are mounted on the front of the enclosure 101 and include a combined on-off and volume control 110, a command button 121, a cursor control 116, a select button 118, a tuning control 114, and a button bar 120. The cursor control 116 provides up, down, left, and right movements of a cursor or other entity on a display device 112. The button bar 120 provides buttons to select an audio source, including, for example, "AM" radio, "FM" radio, "Web" radio, "Cassette", and "External" input. Also mounted on the front of the enclosure 101 is the display device 112, which provides information to the user. An optional cassette player/recorder 130 provides the capability to play and record audio cassettes. The intelligent radio 100 also includes a left stereo speaker 106 and a right stereo speaker 108 that may be mounted in the enclosure 101 or in separate enclosures. A wireless remote 135 provides remote operation of the intelligent radio 100. In some embodiments, a microphone is provided as well. An output from the microphone is provided to an analog-to-digital converter to convert the analog microphone signal into digital data. The microphone may be placed in the intelligent radio 100, in the wireless remote 135, or both.

FIG. 2 is a block diagram of the functional elements of the intelligent radio 100. The intelligent radio 100 comprises a Central Processor Unit (CPU) 202 that is used to run the intelligent radio software. The CPU 202 is connected to a random access memory 204, a data storage device 210, and a modem 206. The data storage device 210 may be any type of non-volatile data storage device, including, for example, a floppy disk drive, a hard disk drive, a flash memory, a CD-ROM, a DVD-ROM, a CMOS memory with battery backup, etc. The data storage device 210 provides storage for software

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programs used by the intelligent radio 100. The software stored on the data storage device 210 may be upgraded by downloading new software from the Web. The data storage device 210 may also provide storage for digitized audio material, such as recorded Web radio broadcasts, CD-Audio, etc. The modem 206 is connected to a communications network 230, shown as a Public Switched Telephone Network (PSTN), by the network cable 102. Although the communications network 230 is shown as a PSTN network, one skilled in the art will recognize that the network 230 may also be a cable television (CATV) network, a satellite network, or any other communications network. In one embodiment, the network 230 comprises both a Direct TV/PC satellite connection that provides information to the intelligent radio 100 at high speed (e.g., 400,000 bytes per second or more), and a PSTN network connection so the intelligent radio can upload information back to the ISP 232 (because many Direct TV/PC connections are only one-way). In yet another embodiment, the satellite network is a two-way satellite network that uses the satellite for both download and upload. In one embodiment, the satellite network uses the Iridium™ system developed, in part, by the Motorola Corp.

Optionally, a telephone 229 is connected to a first port of a codec 260. A second port of the codec 260 is provided to the CPU 202. The codec 260 provides digital-to-analog conversion and analog-to-digital conversion for the telephone 229. The codec 260 also provides standard telephone interface signals, such as a ringing signal, to the telephone 229, and telephone status conditions, such as receiver up or receiver down, to the CPU 202. In some embodiments, the codec 260 and the modem 206 may be combined as a telephone modem. The telephone 229 may be connected even when the network 230 is not a telephone network.

The modem 206 provides an interface between the CPU 202 and the communications network 230 and the operational characteristics of the modem 206 are determined by the type of communications network 230. Thus, if the network 230 is a PSTN network, then a telephone modem is used; if the network 230 is a CATV network, then a cable modem is used, etc. In a preferred embodiment, the modem 206 is integral to the intelligent radio 100. In other embodiments, the modem 206 is provided in a separate enclosure. An Internet Service Provider (ISP) 232 provides the user with a connection from the communications network 230 to the Web via the Internet 234. Note that FIG. 2 shows functional elements, but not necessarily hardware configurations. Thus, for example, the modem 206 may be implemented in software on the CPU 202. The CPU 202 may be a Digital Signal Processor (DSP). The CPU 202 may comprise a single computer processor, or multiple computer processors. In one embodiment, the CPU 202 comprises two processors, a DSP and a general purpose microprocessor. In one embodiment, the modem 206 is provided in a plug-in module such that the intelligent radio can be configured for different types of computer networks by simply changing the modem plug-in to suit the type of network being used.

The CPU 202 provides data to the display device 112. The CPU 202 receives user inputs from the command button 121, the tuning control 114, the button bar 120, the select button 118, and the cursor control 116. The CPU 202 provides digitized audio samples to an input of a Digital-to-Analog Converter (DAC) 220. The analog audio output of the DAC 220 is provided to an amplifier 222. In a preferred embodiment, the DAC 220 and the amplifier 222 are each two-channel devices, providing left and right stereo channels. A left channel output of the amplifier 222 is provided to the left channel speaker 106 and a right channel output of the amplifier 222 is provided

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to the right channel speaker 108. The volume control 110 controls the gain of the amplifier 222.

As shown in the preferred embodiment in FIG. 2, the other optional audio sources such as the cassette device 130, an AM tuner 240, an FM tuner 242, and an external input 244 also provide inputs to the amplifier 222. Other optional audio sources may be provided, such as, for example, an audio CD, a DVD, a digital audio tape unit, etc. The CPU 202 controls the cassette device 130, the AM tuner 240, the FM tuner 242, and other optional audio sources. A line output from the amplifier 222 may also be provided to a record input of the cassette device 130.

As described above, the button bar 120 is used to select one of the audio sources. When the button bar 120 is set to "AM," the intelligent radio 100 operates in an AM radio mode. In the AM radio mode, an analog output from the AM tuner 240 is provided to the amplifier 222. Also in the AM radio mode, the display device 112 displays the frequency of an AM station selected by the AM tuner 240. The user may use the tuning control 114 to select a desired AM station. The AM mode is optional.

An analog output from a microphone 250 is provided to an analog input of an analog-to-digital converter 252. A digital output from the analog-to-digital converter 252 is provided to the CPU 202. The microphone 250 and converter 252 allow for voice commands to control the intelligent radio. The microphone 250 and converter 252 are optional. In some embodiments, a microphone is also placed in a wireless remote so that voice commands can be provided from the wireless remote.

When the button bar 120 is set to "FM," the intelligent radio 100 operates in an FM radio mode. In the FM radio mode, the analog audio output from the FM tuner is provided to the amplifier 222, and the display device 112 displays the frequency of the FM station selected by the FM tuner 242. The FM mode is also optional.

When the button bar 120 is set to "Cassette," the intelligent radio 100 operates in a cassette playback mode. In the cassette playback mode, analog output from the cassette player is provided to the amplifier 222, and the display device 112 displays information relating to the cassette playback. The cassette playback mode is also optional. The cassette device 130 may also optionally be configured to provide a record capability such that the cassette can be used to record audio information from any of the other modes. Thus, for example, the cassette can be used to record FM radio, AM radio, or Web radio broadcasts.

When the button bar 120 is set to "Web," the intelligent radio 100 operates in a Web Radio mode. In the Web Radio mode, the intelligent radio 100 uses the modem 206 to connect to the ISP 232. The ISP 232 provides a list of available Web broadcasts, and access to the Internet 234, so that the various Web broadcasts can be received by the intelligent radio 100. In the Web Radio mode, the display device 112 is used to select a Web broadcast and to provide information about the selected Web broadcast.

FIGS. 3A through 3E show various displays provided by the display device 112 while in the Web Radio mode. FIG. 3A shows a default display 300 that appears while a Web broadcast is being received. FIG. 3B shows a menu display that allows the user to select one of the command and setup displays shown in FIGS. 3C-3E.

The display 300, shown in FIG. 3A, includes information about the Web broadcast including the type of broadcast (e.g., "Newscast"), the Web address (URL) of the source for the broadcast (e.g., <http://www.npr.org>), a description of the



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broadcast (e.g., "National Public Radio 1997"), a broadcast format (e.g., "Streaming RealAudio"), etc.

FIG. 3B shows a menu display 320 that allows the user to access the various setup and control displays shown in FIGS. 3D-3E. The user activates the menu display 320 by pressing the command button 121. The display 320 provides a menu list 322 that lists the various other command displays. The list 322 may provide: a "Tune Station" command for activating a tune-station display 340, shown in FIG. 3E; a "Select Language" command for activating a select-language display 310, shown in FIG. 3C; and a "Select List" command for activating a select-list display 322, shown in FIG. 3D. The list 322 may also provide commands to activate other displays (not shown) such as "Setup," to initialize the intelligent radio, "Scan Stations," to get a new list of Web broadcast stations from the Internet 234, and "Define Station," to manually define a Web broadcast station not listed. The list 322 may also provide commands to activate other displays such as "Set Clock," and "Set Alarm," to provide optional clock and alarm clock modes for the display device 112.

The display 320 also provides a scroll bar 321 to allow the user to scroll through the list 322 and select an item (command) from the list. Scrolling may be accomplished by using either the cursor control 116 or the tuning control 114. The user uses the cursor control 116 or the tuning control 114 to highlight a desired menu item in the list 322, and then the user presses the select button 118 to select the highlighted menu item.

The select-language display 310, shown in FIG. 3B, allows the user to elect to receive Web broadcasts in one or more selected languages. The display 310 provides a list of available languages 312 and a scroll bar 314 for scrolling through the list 312. Each item in the list 312 corresponds to a language (e.g., English, French, etc.) and each item is provided with a checkbox 313. If a checkbox 313 is checked, then the corresponding language is enabled. The display 310 also provides an OK button 315, a Cancel button 316, a Clear-All button 317, and a Select-All button 318. The Clear-All button 317 clears all of the checkboxes 313, and the Select-All button 318 checks all of the checkboxes 313. The user "presses" one of the buttons 315-318 by using the cursor control 116 to highlight a desired button and then pressing the select button 118 to "press" the highlighted button.

The select-list display 330, shown in FIG. 3D, allows the user to select a preferred type of program material (e.g., Sports, Weather, News, All, etc.). The display 330 includes a list 332 of program types and a scroll bar 331. The user uses the cursor control 116 or the tuning control 114 to highlight a desired program type from the list 332, and then the user presses the select button 118 to select the highlighted program type.

The select-broadcast display 340, shown in FIG. 3E, allows the user to select a Web broadcast. The display 330 includes a list 342 of the available Web broadcasts having the proper language (as selected in the select language display 310) and the desired program type (as selected in the select-list display 331). The user uses the cursor control 116 or the tuning control 114 to highlight a desired broadcast from the list 342, and then the user presses the select button 118 to select the highlighted program type. Each item in the list 342 is provided with a checkbox 343. If the checkbox 343 is checked, then the corresponding broadcast is a preferred (or "fast-tune") broadcast. The user may scroll through the fast-tune broadcasts by using the tuning control 114 from the default display 300 shown in FIG. 3A, without having to activate the select-broadcast display 340. This provides a

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convenient shortcut feature to allow the user to quickly tune to stations that the user regularly listens to.

FIG. 4 illustrates a data-entry display 450 that allows the user to input alphanumeric text (e.g., the telephone number of the ISP 232 or a URL). The display 450 includes a text prompt 451 to prompt the user for the desired data. The display also includes an on-screen keyboard 452, a text display 453, an OK button 454 and a Cancel button 455. The user enters text by using the cursor control 118 to highlight a desired character on the on-screen keyboard 452 and then pressing the select button 118 to enter the highlighted character into the text display 453. The OK button 454 and the Cancel button 455 are "pressed" in the same fashion.

FIG. 5 is a flowchart 500 that begins at a start block 501 and illustrates the Web Radio mode process. The process advances from the start block 501 to a decision block 502, where the process checks a status flag to determine whether or not the intelligent radio software needs to be initialized (setup). If setup is needed, then the process advances to a process block 504; otherwise, the process jumps over the setup steps to a process block 514. In the process block 504, the process obtains a phone number for the desired ISP 232. The phone number may be obtained from a default phone number stored in the intelligent radio software, or by prompting the user through the data-entry display 450. Once the phone number has been obtained, the process advances to a process block 506, where the modem 206 dials the telephone number and establishes a modem connection with the ISP 232. Once the connection is established, the process advances to a process block 508 where the user establishes an account with the ISP 232.

In one embodiment, the user is prompted for a password that is stored on the data storage device 210 or entered using the data-entry display 450. Establishing an account may include other actions, such as creating a username for the user, changing the phone number used to access the ISP 232, and entering information about the user and the user's account. Once an account is established, the process advances to a process block 510 where a list of available Web radio broadcast stations is downloaded to the intelligent radio 100 from the ISP 232 and stored on the storage device 210. Lists of available languages and program types are also downloaded and stored on the storage device 210. Once the lists are downloaded, the process advances to a hang-up block 512 wherein the modem 206 terminates the network connection (e.g., hangs-up the phone). Upon hang-up, the setup process is complete, and the process advances to the process block 514.

In the process block 514, the modem dials the ISP 232 and then advances to a process block 516 where the intelligent radio 100 logs on to the user's account at the ISP 232. The hang-up, redial, and logon (blocks 512, 514, and 516, respectively) is desirable when using a PSTN, because the initial telephone call, placed in the block 506, is typically a long-distance call or a toll-free (e.g., a 1-800) call. By contrast, the telephone call placed in the block 514 is typically a local call. When using a non-PSTN network (e.g., a cable modem, a satellite network, etc.) then the hang-up, redial, and logon (blocks 512, 514, and 516, respectively) is typically omitted.

Once the user is logged on, the process advances to a process block 518 where the user selects (tunes) a Web radio broadcast station. Once a Web broadcast has been selected, the process advances to a process block 520 where the intelligent radio 100 receives the Web broadcast. The CPU 202 decodes and decompresses the received data as necessary and then sends the decompressed data to the DAC 220 where it is converted to an analog signal that is subsequently played on

the speakers 106, 108. The process remains in the process block 520 while the user listens to the Web broadcast.

If the user tunes to a new Web broadcast station (e.g., by turning the tuning control 114 or by activating the select-broadcast display 340) then the process loops back to the process block 518, selects the new station, and returns to the process block 520.

FIG. 6A illustrates the information management and data processing functions 600 provided by a Web Radio site 602 (e.g., www.webradio.com). Access to the Internet site 602 is made possible by the Internet access provided by the ISP 232. The Internet site 602 provides a list of Web radio broadcast stations for the user and optionally other value-added services that enhance the operation of the intelligent radio 100. For example, the Internet site 602 may provide a list of available program sources and streaming audio programming. The site 602 may also maintain user profile comprising a list of preferred Internet "broadcast stations." The site 602 also provides special download capabilities such that the user can download information and software into the intelligent radio. The site 602 also provides upload capabilities such that the user can upload information, such as preferences, etc., from the intelligent radio 100 to the site 602. For example, the site 602 can provide a customized list of stations for each user and voicemail capability. The site 602 may provide reformatting of streaming audio data into a format better suited for the intelligent radio.

In one embodiment, the site 602 also provides Web telephone capabilities to the intelligent radio 100, such that the user can use the intelligent radio as a telephone to talk to other users that are connected to the Internet. In one embodiment of the Web telephone, the codec 260 is used to digitize speech from a microphone in the handset of the telephone 229. The digitized speech is sent over the network 230 to the ISP. The ISP forwards the digitized speech to a remote user. Similarly, the ISP provides digitized speech from the remote user to the intelligent radio. The intelligent radio uses the codec 260 to convert the digitized speech into analog signals that are played on the speakers 106 and 108 or a speaker in the handset of the telephone 229.

In yet another embodiment, the intelligent radio provides voice email in connection with the site 602. To receive email, text-to-voice software in the site 602 is used to convert email text into digitized voice data as words spoken in the user's desired language. The digitized voice data is provided to the intelligent radio where it is converted to an analog signal and played on the speakers 106 and 108 or a speaker in the handset of the telephone 229. To receive email, the user speaks into the microphone 250 or the microphone in the handset of the telephone 229 and the spoken words are converted into digitized speech by the intelligent radio. The intelligent radio sends the digitized speech to the site 602 where it is converted into email text and then emailed to the recipient. The software to convert speech to text and text to speech is provided in the site 602 in order to minimize the cost and complexity of the intelligent radio. Alternatively, the software to convert speech to text and text to speech is provided in the intelligent radio.

In one embodiment, the site 602 also provides special formatting and markup protocols that are tailored to the intelligent radio display 112. Most existing Internet sites are geared towards a computer or television and assume that a user has a large, high resolution, color monitor. Most existing Internet sites also assume that a user is accessing the site by using a Web browser such as Netscape Navigator™ or Microsoft Internet Explorer™. These browsers support high level protocols such as HyperText Markup Language (HTML). The display 112 may be relatively smaller, and

relatively less capable than a traditional computer monitor. In some embodiments, the display 112 does not necessarily need all of the capabilities and complexity of HTML and is thus better served by information that is formatted for the display 112 and that is expressed in a markup language that is suited to the needs of the intelligent radio 100, without the overhead and complexity of HTML.

When the user connects to the Internet site, information is passed along a first data stream to an account management block 604. The block 604 provides account management functions relating to the user's account with the ISP 232. The account management block passes data to a user preference block 606, which retrieves user profile information and user preferences specified by the user. Information regarding the user preferences may be stored by the ISP 232, or downloaded from the intelligent radio 100 as needed.

Information is also passed from the process block 602 along a second data stream to a program management block 608. The program management block 608 accesses a language variety database 610 to determine which languages are available, and a program variety database 612 to determine which types of programs are available. The program management block 608 also accesses program sources such as live broadcasts 620, archived broadcasts 624, stored music 626, and other streaming audio sources 622.

User profile information from the user preference block 606 and program data from the program management block 608 are provided to a program list block 616, which constructs a list of available Web programs (broadcasts) that fit the user's preferences. The list constructed in the block 616 is passed to the intelligent radio 100.

FIG. 6B shows the conceptual relationship between the site 602 and other Web sites that supply streaming audio information, such as a site 630, a site 631, and a site 632. The Internet provides the ability to transfer data between any two of the sites 602, 630-632. The user connects, through the ISP 232, to the site 602. The site 602 provides links to the sites 630-632 through the programming lists provided by the site 602. If the user selects a streaming audio program from one of the sites 630-632, then the site 602 provides the necessary link to the selected site. In some embodiments, the site 602 provides the link information to the intelligent radio 100, and the intelligent radio 100 makes a "direct" connection to the selected site. In other embodiments, the site 602 links to the selected site, receives the streaming audio data, reformats the data if desired, and then sends the streaming audio data to the intelligent radio 100.

FIG. 7 illustrates an embodiment of an intelligent radio tuner 700. The tuner 700 is mounted in an enclosure 701 and connects to household AC power through a power cord 104, to a network through a network cable 102, and to an audio system through an audio line 702. User controls are mounted on the front of the enclosure 701 and include an on-off switch 704, a command button 121, a cursor control 116, a select button 118, and a tuning control 114. The cursor control 116 provides up, down, left, and right movements of a cursor or other entity on a display device 112. Also mounted on the front of the enclosure 701 is the display device 112, which provides information to the user.

FIG. 8 is a block diagram of the functional elements of the intelligent radio configured as a tuner 700. The tuner 700 comprises the Central Processor Unit (CPU) 202 that is used to run the intelligent radio software. The CPU 202 is connected to the random access memory 204, the data storage device 210, the modem 206, and the codec 260. The data storage device 210 may be any type of non-volatile data storage device, including, for example, a floppy disk drive, a

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hard disk drive, a flash memory, a CD-ROM, a DVD-ROM, a CMOS memory with battery backup, etc. The modem 206 is connected to a communications network 230, shown as a Public Switched Telephone Network (PSTN). Although the communications network 230 is shown as a PSTN network, one skilled in the art will recognize that the network 230 may also be a cable television (CATV) network, a satellite network, or any other communications network. The modem 206 provides an interface between the CPU 202 and the communications network 230 and the operational characteristics of the modem 206 are determined by the type of communications network 203. Thus, if the network 230 is a PSTN network, then a telephone modem is used; and if the network 230 is a CATV network, then a cable modem is used, etc. An Internet Service Provider (ISP) 232 provides the user with a connection from the network 230 to the Web via the Internet 234.

The CPU 202 provides data to the display device 112. The CPU 202 receives user inputs from the command button 121, the tuning control 114, the select button 118, and the cursor control 116. The CPU 202 provides digitized audio samples to an input of a Digital-to-Analog Converter (DAC) 220. The analog audio output of the DAC 220 is provided to the audio output 702. In a preferred embodiment, the DAC 220 is a two-channel device, providing left and right stereo channels.

FIG. 9 is a block diagram of the functional elements of an embodiment of an intelligent radio that provides for remote playback. FIG. 9 shows a base unit 900 that is connected to the communications network 230. The base unit 900 receives streaming audio from the Web and transmits the audio information to a remote playback unit 902.

The base unit 900 is similar in most respects to the intelligent radio except that the amplifier 222, the loudspeakers 106 and 108, and the volume control 110 are not located in the base unit 900, but rather are located in the remote playback unit 902. In the base unit, the DAC 220, the cassette device 130, the AM tuner 240, the FM tuner 242, and the external input 244 are connected to a transmitter 904 rather than the amplifier 222. The transmitter 904 provides a transmitted signal to a receiver 906 in the remote unit 902. The receiver 906 provides an audio output to the amplifier 222.

The base unit 900 receives the streaming audio information from the Internet 234 and uses a transmission carrier to retransmit the audio information to one or more remote units 902. The transmitter 904 and the receiver 906 may use any form of communication for the transmission carrier, including radio frequency communication, infrared communication, ultrasonic communication, etc. In one embodiment, the transmitter 904 may be a low power FM (Frequency Modulation) transmitter compatible with standard FM broadcast bands, such that the remote playback unit 902 can be a standard FM transistor radio or a stereo receiver. In yet another embodiment, the transmitter 904 may be a low power AM (Amplitude Modulation) transmitter compatible with standard AM broadcast bands, such that the remote playback unit 902 can be a standard AM transistor radio or a stereo receiver.

In other embodiments, the base unit 900 may also include an amplifier 222, loudspeakers 106 and 108, and a volume control 110 such that the base unit 900 can provide both playback of the audio information and transmission of the audio information to the remote unit 902.

FIG. 10 is a block diagram of the functional elements of an embodiment of an intelligent radio that provides for remote access, comprising a base unit 1002 and an intelligent radio 1000. The base unit 1002 comprises a transceiver 1012 coupled to a modem 1011. The modem 1011 is connected to the communications network 230. The modem 1011 receives

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data from the ISP and provides the data to the transceiver 1012, which then transmits the data to a transceiver 1010 in the intelligent radio 1000. The transceiver 1010 transmits data from the intelligent radio 1000 to the transceiver 1012. The transceiver 1012 provides the data from the intelligent radio 1000 to the modem 1011, which sends the data to the ISP 232.

The intelligent radio 1000 is similar in most respects to the intelligent radio 100 shown in FIG. 2, with the addition of the transceiver 1010. A data input/output port of the transceiver 1010 is provided to the processor 202 and a Radio Frequency (RF) input/output port of the transceiver 1010 is provided to an antenna. Also, in the intelligent radio 1000, the modem 206 is optional (because network communications are handled by the transceiver 1010 rather than the modem 206).

The transceivers 1010 and 1012 use any suitable means for communication, including, for example, optical communication, radio communication, etc. In a preferred embodiment, the transceivers 1010 and 1012 are radio transceivers that use spread-spectrum communication techniques at a frequency of approximately 2.4 GHz. The combination of the base unit 1002 and the intelligent radio 1000 provides a capability similar to that provided by a cordless telephone. The base unit 1002 can be located near a network connection point (e.g., a telephone outlet), and the intelligent radio 1000 can be conveniently placed anywhere within the range of the base unit 1002. The two-way communication link between the transceiver 1010 and the transceiver 1012 provides a cordless connection to the network 230.

In one embodiment, the intelligent radio, as shown in FIG. 1, is a network-enabled audio device. FIG. 11 illustrates one embodiment of the network-enabled audio device configured for use with other electronic devices. In one embodiment, the network-enabled audio device works in conjunction with a PC. With a network connection, software on a PC can be used to assign playlists of songs to the network-enabled audio device. Further, the network-enabled audio devices can be set to turn on at a certain time and play a playlist of music. In one embodiment, songs encompass a variety of audio sources including, but not limited to, audio files containing music and/or advertisements. Optionally, the network-enabled audio devices can turn on through an Internet connection as well. The front panel, including the user controls, can be disabled in order to prevent users from turning the device off when a playlist is scheduled.

In one embodiment, the network-enabled audio device records user activity and provides that information to a server for data mining purposes. For instance, a user's composition of a playlist including songs from The Beatles can be recorded by the network-enabled audio device and sent to a server tracking the number of users composing playlists including songs from The Beatles. Tracking information can then be provided to record companies interested in selling more Beatles MP3's to gauge consumer demand. In one embodiment, a button is provided for allowing the user to turn the logging feature on or off.

In FIG. 11, an IPAN 1100 includes an IPAN server 1104, a PC IPAN client 1106, a network 1102, a device B 1108, a device A 1110, and user controls 1112. The PC IPAN client 1106 connects to the IPAN Server 1104 through the network 1102 (such as the Internet). The Device 1110 represents a network-enabled audio device, which connects at a default time to the IPAN server 1104. The user can optionally change the default time or can connect to the IPAN server 1104 at a desired time independent of the default time. The user can use the user controls 1112 on the Device 1110 to bypass the default time and connect to the server 1104 immediately. When the Device 1110 connects, the IPAN server 1104 may

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have a playlist for the Device 1110. The IPAN server 1104 downloads the playlist to the device 1110. The IPAN server 1104 checks to see what devices have the audio files listed in the playlist. The IPAN server 1104 maintains a list of URL's from which the device 1110 received audio files listed in the playlists. In one embodiment, the list of URL's is stored in a catalog. In one embodiment, the catalog also includes other information such as, for example, a list of available audio playback devices and their settings, scheduled audio playback, and/or commands for system synchronization. The Device 1110 attempts to connect to the URL's listed as the location from which the songs located on the Device's 1108 hard drive were retrieved from. If the URL's do not work and the song exists in the IPAN 1100, then the audio files are transferred from the Device 1108 to the Device 1110 by uploading the files from the Device 1108 the next time the Device 1108 connects. The next time the Device 1110 connects, it will download the list of files from the server. If the song does not exist in the IPAN, the Device 1110 attempts to download the song at intervals until the user deletes the song from the playlist or the song is added to the Device 1108. In one embodiment, for example, an empty cone will appear beside the song in the playlist that could not be downloaded. The user can delete the song in order to request a cease in the attempts to download, or the user can refrain from deleting the song from the playlist in order to request that further attempts be made to download the song. A request for further attempts in downloading the song results in further iterations of Device 1110 attempting to download the song from the broken URL followed by attempts to upload the song from Device 1108 when Device 1108 connects.

FIGS. 12A and 12B illustrate one embodiment of a network-enabled component audio device 1200. The device 1200 represents one embodiment of the intelligent radio 700. FIG. 12A illustrates a front view of the network-enabled audio device 1200. The network-enabled audio device 1200 has user controls which are mounted on the front of an enclosure 1202 and include a power button 1204, a shuttle control 1214, an enter button 1216, menu buttons 1212, an action button 1210, and a CD-eject button 1222. On the shuttle control 1214, there is a right button 1264, a left button 1260, an up button 1262, and a down button 1266 for navigating through menus on the display 1230. An infrared port 1208 is mounted on the front of the enclosure 1202 to read signals from a remote control 1250. In one embodiment, the remote control includes buttons for volume, enter, navigation shuttle, action, power, CD eject, and five pre-set menu buttons. A CD player 1220 is also mounted on the front of the enclosure 1202 to play standard audio CD's or MP3 encoded CD's.

In one embodiment, the display 1230 has a menu bar to provide the user with options for listening to playlists, listening to the CD player, or listening to streaming audio. The shuttle control 1214 is used to scroll through the selections in a playlist. Each selection is highlighted as the shuttle control 1214 is pressed right 1264 or left 1260. When the user makes a choice, the enter button 1216 is pressed to signify that choice being made. If the user chooses the playlist option, a drop down menu is displayed in the display 1230 showing the available playlists. The user then uses the shuttle control 1214 to scroll through the playlists by pressing the up button 1262 or the down button 1266. Once the user chooses an audio source with the shuttle control 1214, the user can navigate and play the audio with the group of menu buttons 1212.

The group of menu buttons 1212 is context sensitive and will change function depending on the audio source. For example, in one embodiment, if the user selects the CD player 1220 as the audio source, then the first menu button in the

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group of menu buttons 1212 is used to play the CD while the second menu button is used to stop. In one embodiment, the bottom of the display 1230 changes according to the audio source determined by the user. If the user chooses to play CDs, a "play" icon appears above the first button in the group of menu buttons. In one embodiment, if the user chooses to listen to the AM/FM radio, a scan icon appears above the first button in the group of menu buttons 1212.

In addition to allowing the user to play files, the network-enabled audio device allows the user to play audio CD's on the CD player 1220. Further, the user can copy and encode songs off CD's in digital formats (known as "ripping") and compose playlists with those songs and other files and streaming audio.

The action button 1210 allows the user to request the latest news, albums, concerts and other information on artists. For example, if the user is listening to a streaming audio broadcast and does not know who the artist is, he or she can press the action button 1210 and receive information on the display 1230 identifying the artists, the name of the songs, interesting facts about the artist, etc. Optionally, the user can acquire similar information by pressing the action button when listening to a CD or a playlist. In one embodiment, the network-enabled audio device 1200 acquires this information by accessing the IPAN server 1104. The IPAN server 1104 then accesses its own database to search for the requested information. Optionally, the database is located on at least one different server than the IPAN server 1104. In one embodiment, if the information is not found, a sample of the song will be sent to another server to analyze the sample and report back to the IPAN server 1104 with the correct information.

FIG. 12B illustrates a rear view of the network-enabled component audio device 1200. The network-enabled audio device 1200 connects to household AC power through a power cord 1268. The network-enabled audio device 1200 includes a phone jack 1250, an Ethernet port 1252, a line-in connector 1264 having left and right channels, a line-out connector 1262 having left and right channels, a microphone jack 1258, a headphone jack 1260, a TOS link 1256, and a USB port 1254.

In one embodiment, the phone jack 1250 can be used to either establish a modem connection to an ISP and/or to establish a LAN connection (e.g. Home Phone Network Alliance network connection). The Ethernet port 1252 can be used with an Ethernet cable to provide access to an Ethernet LAN. Optionally, the Ethernet port 1252 can be replaced or supplemented with other types of connections to communications networks. A network cable provided to the Ethernet port 1252 can be a network cable, a cable TV cable, a connection to a wireless (e.g., satellite) unit, a power line, etc. For example, the communications network uses satellites developed by the Motorola Corp., Global Star satellites developed by a consortium of European manufacturers which includes Aérospatiale and Alcatel, P21 satellites developed on a project financed by Inmarsat, or the Odyssey satellite system developed by a TRW consortium associated with Teleglobe/Canada.

In one embodiment, the network-enabled audio device 1200 provides an audio output to an associated audio system. For high-speed interaction with other audio components, the digital out TOS link 1256 (also known as "Optic S/PDIF") is used for an optical connection to provide for the transfer of raw digital streams. Files can be transferred from the network-enabled audio device 1200 without a conversion from digital to analog signals. When the audio file reaches the associated audio system, such as for example a portable MP3 player, the digital audio stream is then converted to an analog

stream within the associated audio system to enhance audio quality. The associated audio system provides for amplifiers and loudspeakers.

The line in connector 1264 is an analog line in from another device. The line out connector 1262 is an analog line out to standard left and right RCA-style connectors. The standard USB host connector 1254 allows downloading of music to portable MP3 players (in a host downloading to a slave relationship) and/or USB networking with a PC or other network-enabled audio device 1200 or 1300.

FIGS. 13A and 13B illustrate one embodiment of a tabletop network-enabled audio device 1300. FIG. 13A illustrates a front view of the tabletop version of the network-enabled audio device 1300. As described in more detail below, the network-enabled audio device 1300 is similar to the network-enabled audio device 1200 with the addition of extra features such as a radio, amplifier, and speakers. The network-enabled audio device 1300 has user controls which are mounted on the front of the enclosure 1302 and includes the power button 1204, the shuttle control 1214, the enter button 1216, the menu buttons 1212, the action button 1210, the volume control 1316, and a CD eject button 1222. The shuttle control 1214 includes the right button 1264, the left button 1260, the up button 1262, and the down button 1266 for navigating through menus on the display 1230. The infrared port 1208 is mounted on the front of the enclosure 1302 to read signals from the remote control 1250. In one embodiment, the remote control includes buttons for volume, enter, navigation shuttle, action, power, CD eject, and five pre-set menu buttons. The CD player 1220 is also provided on the device 1300 to play standard audio CD's or MP3 encoded CD's. A right speaker 1303 and a left speaker 1303 are operably connected to the network-enabled audio device 1300.

In one embodiment, the group of menu buttons 1212 perform the same or similar functions as the group of menu buttons 1212 in the network-enabled component audio device 1200 illustrated in FIG. 12 except that the display 1230 will illustrate an additional option of playing an AM/FM radio. Therefore, when the shuttle control 1214 is used to select the AM/FM radio audio source and the user presses the enter button 1216, the icons that reflect functions such as tuning, scanning, and other buttons used to navigate and manage an AM/FM audio source appear. If the user chooses to listen to the AM/FM radio, a scan icon appears above the first menu button 1212.

FIG. 13B illustrates a rear view of the tabletop network-enabled audio device 1300. The network-enabled audio device 1300 connects to household AC power through the power cord 1268. The network-enabled audio device includes the phone jack 1250, the Ethernet port 1252, the line-in connector 1264 having left and right channels, the line-out connector 1262 having right and left channels, the microphone jack 1258, the headphone jack 1260, an AM/FM antenna port 1390, left and right speaker outputs 1392, and the USB port 1254.

In one embodiment, the network-enabled audio device 1300 has an AM/FM antenna port for connecting to an AM/FM antenna. The network enabled audio device 1300 includes an amplifier and loudspeakers 1303 (as will be described in FIG. 14) which connect to the left and right speaker outputs 1350.

FIG. 14 is a block diagram of the functional elements of the network-enabled audio devices 1200 and 1300. The network-enabled audio device 1300 typically includes the functional elements of the network-enabled audio device 1200. The network-enabled component audio device system 1300 includes an AM Tuner 1418, an FM tuner 1420, an amplifier

1422, and the speakers 1303. In one embodiment, the network-enabled audio device 1200 does not include the AM tuner 1418, the FM tuner 1420, the amplifier 1422, or the speakers 1303. A Central Processing Unit (CPU) 1402 and a CPU Support Chip 1406 are used to run the software on the network-enabled audio devices 1200 and 1300. In one embodiment, the CPU 1402 is a StrongARM SA-1110 manufactured by Intel, and the CPU Support Chip 1406 is a StrongARM SA-1111 manufactured by Intel. The network-enabled audio device 1200 includes a display 1408, a modem 1410, a memory card 1412, a data storage device 1414, a codec 1416, a CD player, a DAC 1470, a microphone 1480, a line-in port 1482, and a line out 1484. Further, the network-enabled audio device 1200 includes user controls, including a shuttle control 1214, a group of menu buttons 1212, an enter button 1204, and an action button 1210. The network-enabled audio device 1200 connects externally to a network 1428. The network 1428 is shown as a Public Switched Telephone Network (PSTN) 1428 that connects to an ISP 1429 which gives access to the Internet 1102. Through the Internet 1102, a user can access the server site 1104 and thereby access the server site IPAN software 1433.

In one embodiment the CPU 1402 communicates with the random access memory 1412, the telephone modem 1410, and the display 1408. The memory 1412 can be flash memory or a combination of flash memory and other types of memory. The memory 1412 can be volatile or non-volatile or a combination of volatile and non-volatile. The modem 1410 is connected to a communications network 1428, shown as a PSTN 1428. In one embodiment, the modem 1410 is also connected to an IPNA network. Although the communications network 1428 is shown as a PSTN network, one skilled in the art will recognize that the network 1428 can also be a cable television (CATV) network, a satellite network, or any other communications network. In one embodiment, the network 1428 comprises both a Direct TV/PC satellite connection that provides information to the network-enabled audio device at high speed (e.g., 400,000 bytes per second or more), and a PSTN 1428 network connection so the intelligent radio can upload information back to the ISP 1429 (because many Direct TV/PC connections are only one-way). In yet another embodiment, the satellite network is a two-way satellite network that uses the satellite for both download and upload.

A part of the codec 1416 is provided to the CPU Support Chip 1406. In one embodiment, the codec is a Cirrus CS4299 audio codec. The codec 1416 provides analog-to-digital conversion for the microphone 1480 and for the line in 1482, and digital-to-analog conversion for the line out 1484. In some embodiments, the codec 1416 and the modem 1430 are combined as a telephone modem.

The modem 1410 provides an interface between the CPU 1402 and the communications network 1428 and the operational characteristics of the modem 1410 are determined by the type of communications network 1428. Thus, if the network 1428 is a PSTN network, then a telephone modem is used; if the network 1428 is a CATV network, then a cable modem is used, etc. In a preferred embodiment, the modem 1430 is integral to the network-enabled audio device. An Internet Service Provider (ISP) 1429 provides the user with a connection from the communications network 1428 to the Web via the Internet 1430. The server site 1104 can then be accessed, and the server site IPAN software 1433 can be used by the user to manage audio sources and devices. Note that FIG. 14 shows functional elements, but not necessarily hardware configurations. Thus, for example, the modem 1410 can be implemented in software on the CPU 1402 or even on the CPU Support Chip 1406. The CPU 1402 is a single computer

processor, or multiple computer processors. In one embodiment, the CPU 1402 comprises two processors, a Digital Signal Processor (DSP) and a general purpose microprocessor. In one embodiment, the modem 1410 is provided in a plug-in module such that the intelligent radio can be configured for different types of computer networks by simply changing the modem plug-in to suit the type of network being used.

Optionally, the microphone 1480 is connected to a second port of the codec 1416. An analog output from the microphone 1480 is provided to the codec 1416. A digital output from the codec 1416 is provided to the CPU 1402. The microphone 1480 allows for voice commands to control the network-enabled audio device. The microphone 1416 is optional. In one embodiment, a microphone (not shown) is also placed in a wireless remote so that voice commands can be provided from the wireless remote. Optionally, headphones can also be used.

The CPU 1402 provides data to the display device 1408. The CPU 1402 receives user inputs from the shuttle control 1214, the group of menu buttons 1212, the enter button 1202, and the action button 1210.

A system bus interface interconnects the CPU 1402 to the CPU Support Chip 1406. In one embodiment, the CPU Support Chip provides digitized audio samples to an input of the Digital-to-Analog Converter (DAC) 1470. The analog audio output of the DAC 1470 is provided to the amplifier 1422. In one embodiment, the DAC 1470 and the amplifier 1422 are each two-channel devices, providing left and right stereo channels. Channel outputs of the amplifier 1422 are provided to the speakers 1303. The volume control controls the gain of the amplifier 1422. In one embodiment, the amplifier and speakers are part of an external stereo system.

The CPU support chip 1406 is also operably connected to a CD player 1426 which outputs audio to the amplifier 1422 or an external amplification system. The CPU Support Chip 1406 or optionally the CPU 1402 also maintains software for managing the transfer of audio files from CD's to the network-enabled audio device's hard drive.

FIG. 15 illustrates a configuration for assigning playlists and audio sources to a network-enabled audio device 1510 or other devices such as a PC 1508 from a network-enabled audio device 1520 or another device. Each network-enabled audio device 1510 has a storage space 1512 for network-enabled audio device IPAN software 1526, a playlist 1528, and associated URL's and songs within the playlist. Similarly, each network-enabled audio device 1520 has a storage space 1522 for network-enabled audio device IPAN software 1526, a playlist 1528, and associated URL's and songs within the playlist. Each client PC 1508 has a storage space 1524 for client IPAN software 1532, a playlist 1534, and associated URL's and songs within the playlist. The server site 1104 includes server site IPAN software 1433, the playlist 1528 stored on the storage space 1522 of device 1510, the playlist 1530 stored on the storage space 1524 of the client PC 1508, and the playlist 1530 stored on the storage space 1522 of the device 1520. A storage space 1506 is provided to the server site 1104 for use in uploading and downloading audio files when URL's are broken. Storage space 1506 for the server site IPAN 1104 and other software programs can be stored externally or locally at the site.

Each network enabled audio device 1510 has storage space 1512 for a playlist 1528, which is a list of audio files and associated URL's of where the audio files were retrieved from. Optionally, the associated URL's can be archived for only file formats that are streaming audio or MP3. Multiple playlists can be stored on the storage space 1512. In addition

to the playlist 1528, the actual audio files listed in the playlist are also stored in the storage space 1512. The audio files can be streaming audio, Windows Media Audio (WMA), and other audio formats. The network enabled audio device 1520 performs the same functions as the network enabled audio device 1510 with the storage space 1522, the playlist 1530, the network-enabled audio device IPAN software 1526, and songs and associated URL's.

The PC client 1508 has a storage space 1524 for a playlist 1534 and associated URL's and songs in the playlist. PC IPAN client software 1532 is also stored on the storage space 1524. The PC client 1508 includes a web browser (e.g., Microsoft Explorer, Netscape Navigator, etc.), an IPAN plug-in to the web browser, and an IPAN active tray software module.

The IPAN plug-in opens as soon as the web browser is opened. The IPAN plug-in affects the handling of links to MP3 files, streaming audio, and any other audio file type designated. Whenever a user selects, saves, or opens a file in the web browser, the IPAN plug-in intercepts the normal processing of the web browser and will check to see if the file is an audio file. If the file is an audio file, the IPAN plug-in will allow the user to download the audio file to the IPAN 1100 now or to schedule the file for download at a later time. In either case, the URL can be added to the playlist. Further, the IPAN plug-in will periodically connect to the server site IPAN software 1433 to receive software upgrades or to upload updates of the audio files present on the client PC 1433.

The web browser can be used to connect to the server site 1104 and provide access to the server site IPAN software 1433. The IPAN active tray software module runs in the background when the PC client 1508 is turned on. Without the web browser being opened, the IPAN active tray software module can play audio files in playlists.

At the server site 1104, the user can access the server site IPAN software 1433 through a network connection to the server site IPAN 1104 and from the server site IPAN software 1433 the user can assign playlists to different devices such as the network-enabled audio device 1510, the network-enabled audio device 1520, or the client PC 1508. The user composes the playlists from the server site IPAN software 1433, but typically only stores the title of the song and the URL from which the song came. The playlists stored throughout the IPAN 1100 are also stored in the server site IPAN 1433. The user then has a master list of where all playlists are located. When the device 1510 connects to the server site IPAN 1104, a playlist is assigned to it. Within the playlist, the URL's indicate the location from which the audio files associated with the song titles in the playlist can be downloaded. The network-enabled audio device 1510 then proceeds to download the song from the given site specified by the URL to the disk space 1512 on the device 1510. If the site at the URL is not working, the server site IPAN software 1433 will upload the playlist from the disk space 1522 of another device 1520 the next time the second device 1520 connects to the network. The next time the original device 1510 calls in, it will download the playlist from the server site 1104.

Further, the server downloads software upgrades, if necessary, when the device accesses the IPAN 1433. For example, if the disk space in a device that was supposed to have a playlist was accidentally erased, then the server site 1104 provides the URL's for sites to download the lost playlists. In addition, the server site 1104 downloads any other software used to enhance the communications between the server and the device. Software can also be downloaded to be used by the CPU 1402 or the Support Chip CPU 1406.

In one embodiment, there is no server site 1104. The PC IPAN client software 1532 stores the playlists that are located throughout the IPAN 1100. Through a network connection, the PC IPAN client software assigns playlists to devices 1510 and 1520.

FIG. 16 illustrates the connection steps used when the user first sets up the network-enabled audio device. A user begins at process block 1601 by connecting the speakers and radio antennas to the back of the unit. The user also takes other preparatory measures such as plugging in the AC power cord and connecting a phone cable to a telephone jack. At the next process block 1602, the user can choose to begin listening to preloaded music without setting up any of the software by pressing the power button 1204 on the machine and pressing the "Listen Now/Setup Later" button on the first screen. The user can thus listen to preloaded music before even setting up the software for the network-enabled audio device. The process then advances to the next process block 1603 where the user can scroll through the playlists of preloaded music by using the shuttle control 1214 and the enter button 1216. At the next process block 1605, the user begins to set up the network-enabled audio device 1200 by inserting a setup CD into the CD player 1220. The process advances to process block 1606 where the user returns to the first screen and selects "Setup Now" in order to begin loading the PC IPAN client software 1532 on the network-enabled audio device 1200.

FIGS. 17A through 17I show various displays provided by the PC IPAN client software 1532 and the server site IPAN software 1433. In one embodiment, these displays are produced by web pages provided by the server and display on the user's PC in a web browser. FIG. 17A illustrates a Playlist Manager window 1700 that appears when a user runs the PC IPAN client software 1532 and the server site IPAN software 1433. The user-control buttons in the Playlist Manager window include a client feature control button 1702, an audio player window button 1704, a create new playlist button 1706, a delete button 1708, a schedule button 1710, a play button 1712, a scan hard drive button 1714, an add device button 1716, and a synchronize button 1718. Personal Audio Information Tabs 1726 allow the user to view classifications for audio such as by artist or playlist. The display playlist and song button 1740 provides access to audio and devices such as PC's, network-enabled audio devices 1200 and 1300, portable audio devices, etc. Access is provided as a tree control in the playlist window 1780. The playlist window 1780 displays playlists, the title window 1720 displays songs in the playlist, an arrow button 1760 provides for addition of songs to playlists, and an arrow button 1799 provides for deletion of songs from playlists.

The Client Feature control button 1702 allows the user to select a desired playlist or other audio source to listen to. The client feature control button also allows the user to control the look and feel of the window such as color and background designs ("skins") etc. The user clicks the play button 1712 to play a selection. To control the volume, shuffle, repeat, and other playback functions, the user clicks the audio player window button 1704. A new popup window appears with buttons for each of those functions. In addition to choosing a playlist, the user can compose a new playlist. The user clicks the new playlist button 1706 to create a new playlist by artist, album, or genre. The user can scan the PC's hard drive for music to incorporate into a playlist by clicking the scan button 1714. The user can also add a device to the IPAN 1433 by clicking the add device button 1716.

To help manage playlists and devices, the Playlist Manager 1700 provides personal audio information tabs 1726. The

devices that can be managed include network-enabled audio devices 1200 and 1300, PC's, portable MP3 players, cell phones, etc. With the personal audio information tabs 1726, the user can view and manage the devices, playlists, and audio classifications by "All," "Playlist," "Album," "Artist," "Genre," "Books," or "Clips." The playlist window 1780 lists the playlists selected by the personal audio information tabs 1726. The title window 1720 lists the songs in a playlist selected in the playlist window 1780. Songs are added to a playlist listed in the playlist window 1780 using the arrow button 1760 and removed from a playlist listed in the playlist window 1780 using the arrow button 1799. The user deletes audio files from the IPAN 1100 by selecting the file and pressing the delete button 1708. Further, the user can schedule playlists or streams to be heard at designated devices and at designated times by using the schedule button 1710. The user can synchronize with the server site IPAN 1433 by clicking the synchronize button 1718. Playlists are stored on the server site IPAN 1433 in addition to the PC IPAN client 1508 or device 1510. In other words, a playlist may have been updated at the server site IPAN 1433 by adding or deleting some songs in the playlist. The user can choose to have the same playlist with two different songs at the server site 1104 and on the device 1200 or 1300. But, if the user made the playlist at the server site IPAN 1433, the user presses the synchronize button 1718 so that the next time the device 1200 or 1300 connects, an updated playlist will be downloaded. To access a playlist or the playlists on a particular device, the user clicks the display button 1740.

FIG. 17B illustrates the display of an audio player window 1792 that includes a previous track button 1782, a play button 1784, a stop button 1786, and a next track button 1790. The audio player window 1792 is invoked by pressing the audio player window button 1704. A volume indicator 1794 displays the current volume. The user can click on the volume indicator 1794 to drag it higher or lower to a different volume. The user can click the shuffle button 1796 to "randomize" the playlist as opposed to playing the playlist in the same order. Further, the user can press the repeat button 1798 in order to have continuous play as opposed to the playlist stopping when it runs out of songs to play. The playlists will typically start from the beginning.

FIG. 17C illustrates the display of the audio player window 1700 showing popup menus that appear when the user attempts to assign a highlighted playlist to another device. After the user highlights a song, the user can right-click on the song in order to have a popup menu 1761 appear with a variety of options such as "Load," "Play," "Blast To," "Copy To," "Make Available On," and "Delete." The user can choose the menu option of "Make Available On" to assign the playlist from one device to another, (e.g. from device 1510 to device 1520). The addition of the device 1510, the device 1520, a portable player, a PC, etc. to the IPAN 1100 will be discussed with reference to FIG. 17I. Once the "Make Available On" option is chosen, another window 1762 appears with options of devices for the playlist to be assigned to. In FIG. 17C, the playlist is assigned to "Living Room iRad-S" instead of "Office Desktop computer," "Portable Player," or "Home Desktop Computer."

FIG. 17D illustrates one embodiment of how the list of songs in a playlist is displayed. A speaker icon 1762 is used to indicate a local audio file. In other words, the audio file is located on some storage space within one of the devices (e.g., a network enabled audio device 1200 or 1300, a PC, a portable player, etc.). A speaker outline icon 1763 indicates a link to an audio file located elsewhere on another device within the

IPAN 1100. The link can be clicked in order to see what other devices, if any, the file is located on.

FIG. 17E illustrates a scheduling window 1763 that opens in response to the pressing the schedule button 1710. The user can schedule playlists to be played at a particular time and on a particular device. The network-enabled audio device will automatically turn on at the scheduled time and play the given playlist. The user controls can be disabled in order to prevent a user at a remote location from changing the music scheduled to be played at the given time. Optionally, the user controls can be disabled in order to prevent the network-enabled audio device from being turned off. The scheduling window 1763 allows a user to highlight dates on a calendar and choose devices from menus to be played at a specific time. The user can also choose to interactively play the selected playlist on a day of the week at a particular time. For example, the user can choose to have a selected playlist played every Monday, Tuesday, Wednesday, Thursday, and Friday at 6 p.m.

FIG. 17F illustrates a popup menu for selecting the default look and feel ("skin") of the IPAN client 1508. The user accesses the "skin" option by pressing the client feature control button 1702 and the client feature control menu 1764 appears. After the user selects "skin" from the client feature control menu 1764, a "skin" menu 1765 appears to provide different "skin" options such as, for example, "Default," "Executive," "Space," "Sixties," and "Post Industrial." FIG. 17G shows that the "skin" menu 1765 also provides a "Get More Skins" option to allow the user to see other "skins" besides the ones listed in the "skin" window 1765.

FIG. 17H shows how the user can choose to "blast" a playlist of the existing audio files from a device, such as a portable player, and replace them with a new playlist in one easy process. In other words, the user can delete the existing audio files from a playlist without deleting the playlist name and substitute new audio files for the old audio files. After the user selects a song, the user right-clicks on the song to open a window 1766 with the option "Blast to." When the "Blast to" menu item is selected, a popup menu 1767 appears to provide the user with a list of devices that the music can be "Blasted" to. Devices such as the network-enabled audio devices 1200 and 1300, PC's, portable players, etc. can be "Blasted" to.

FIG. 17I illustrates a pop up window 1779 for adding a device to the IPAN. A plurality of fields 1771-1774 and a plurality of fields 1775-1778 are provided to allow the user to enter information concerning the new device to be added. The user enters the name of the new device to be added in the field 1771; the serial number of the device in the field 1772; the device type of the new device in the field 1773, the connection point in the field 1774; the time to automatically download to the new device in the field 1775; the maximum time for download duration in the field 1776, and a folder for receiving files in the field 1778. In addition an OK button 1791 and a Cancel button 1792 are provided. Finally, there is a download box 1793 that is checked to have new files and updates automatically downloaded to the device when it is connected to the IPAN 1100. A device can become a dedicated MP3 server by downloading files to the device every time an audio file is downloaded to any other device.

The user selects the type of device in the field 1773 from a list of devices supported by the IPAN 1100. The user may have more than one type of device in the IPAN 1100. Therefore, the user can enter a name in the field 1771 and the serial number in the field 1772 to distinguish similar devices. If the user designates a portable device, the device which the portable device will be connected to is entered in the field 1774 to provide the IPAN with information about how to access the portable device. The download time is entered in the field

1775 to provide the IPAN with the time when the user would like the device to automatically download. The default time is set to early morning (e.g. between midnight and 5 a.m.) because that is the time when the least amount of people are on the telephone and the Internet. The download duration is entered into the field 1776 to provide a maximum time limit for download duration if desired. The default is unlimited, but the user can set a maximum time so that if the download is not finished within the time limit, the device signs off. Before signing off, the current task will be completed. In other words, if the maximum time is exceeded in the middle of downloading the third song in a download of ten songs, the task of downloading the third song will be completed. The download will continue where it left off upon initiation of the next download command. In the previous example, the download will continue at the fourth song. Finally, the server site IPAN software 1433 will automatically install downloaded files in a designated folder unless the user specifies a different location in the field 1778.

FIGS. 18A through 18H illustrate the use of the display 1800 on the network-enabled audio device. In FIG. 18A, the screen display 1802 includes a "Radio" menu item 1804, a "Playlist" menu item 1806, a "Favorites" menu item 1808, a "Jukebox" menu item 1810, a "CD" menu item 1812, and an "Internet Radio" menu item 1814. Residing in the lower portion of the display 1800, the menu buttons 1821-1825 are in the group of menu buttons 1212 and are provided to correspond to icons 1841-1845 residing in the lower portion of the display 1800. Each one of the icons 1841-1845 represents a different function to be performed with respect to a selected audio source.

The user selects items from the screen display 1802 by using the shuttle control 1214 and the enter button 1216. For example, to select the "CD" audio source, the user presses right shuttle control 1264 until the "CD" menu item is highlighted. The user then presses the enter button 1216. Once an audio source is selected, context sensitive icons 1841-1845 appear above the corresponding menu buttons 1821-1825. Depending on the chosen audio source, the icons 1841-1845 represent different functions.

FIG. 18B illustrates the screen display 1802 when the audio source is an AM/FM radio, such as the AM/FM "Radio" menu item 1804. The menu item 1804 is highlighted to indicate that the AM/FM "Radio" audio source has been chosen. The menu buttons 1821-1825 change context to correspond to icons that represent functions related to the audio source selected. Because the AM/FM "Radio" audio source was selected, the menu buttons 1821-1825 change context to correspond to the icons for an AM/FM tuner. The icons 1841-1845 shown as, respectively, a play icon 1841 corresponding to a play function 1830, a scan next icon 1842 corresponding to a scan next function 1832, a scan previous icon 1843 corresponding to a scan previous function 1834, a radio presets icon 1844 corresponding to a radio presets function 1836, and a stop icon 1845 corresponding to a stop function 1838. As further illustrated in FIG. 18C, if the menu button 1823 corresponding to the icon 1844 representing the radio presets function 1836 is pressed, the menu buttons 1821-1825 change context to correspond to icons 1841-1845 which represent the choice of preset stations with each of the functions 1870-1874 corresponding to a different radio station. In one embodiment, the radio source menu option 1804 is omitted.

FIG. 18D shows the screen display 1802 after the user has selected the Playlist menu item 1806. The menu buttons 1821-1825 are used to select from various playlist icons 1841-1845. The icons 1841-1845 shown as, respectively, a play icon 1841 corresponding to a play function 1875, a



record icon 1842 corresponding to a record function 1876, an export icon 1843 corresponding to an export function 1877, and back to previous menu icon 1845 corresponding to a back to previous menu function 1878. The shuttle control 1214 and the enter button 1216 are used to select a song from the playlist in order to play. The record function 1876 will record a playlist to the network-enabled audio device's storage device 1510. The export mode downloads the playlist to a portable player. After a song is chosen from a playlist in FIG. 18D, FIG. 18E shows the menu buttons 1821 and 1822 changing context to correspond to icons 1840 and 1841. The icons 1841 and 1842 are shown as, respectively, a delete icon 1841 corresponding to a delete function 1848 and a back to previous menu icon 1850 corresponding to a back to previous menu function 1850.

FIG. 18F illustrates the Jukebox audio source 1810, which provides a listing of all the audio files stored on the hard drive 1512 of the network enabled audio device 1510 by Title, Artist, Album or Genre. The menu buttons 1821 and 1822 change contexts to correspond go icons 1840 and 1841. The icons 1841 and 1842 are shown as, respectively, a play icon 1849 corresponding to a play function 1849 and a back to previous menu icon 1851 corresponding to a back to previous menu function 1851.

FIG. 18G illustrates the CD audio source 1812 being selected. The menu buttons 1821-1823 change context to correspond to icons 1841-1843. The icons 1841-1843 are shown as, respectively, a Name CD icon 1841 corresponding to a Name CD function 1852, a Record CD icon 1842 corresponding to a Record CD function 1854, and a back to previous menu icon 1843 corresponding to a back to previous menu function 1856. The Record CD function 1854 can be used to copy tracks from a CD to the hard drive 1512 for future use in playlists. The Name CD function 1852 is used to retrieve a title name for a track and other information via the Internet from a CD database site after the Record CD function 1854 has been used to copy the CD to the hard drive. In one embodiment, an online database is checked via the Internet.

In FIG. 18H, when the CD player is being played, menu buttons 1821-1825 change context to correspond to icons 1841-1844. The icons 1841-1844 are shown as, respectively, a previous track icon 1841 corresponding to a previous track function 1892, a pause icon 1842 corresponding to a pause function 1894, a next track icon 1843 corresponding to a next track function 1896, and a stop icon 1844 corresponding to a stop play function 1898.

FIG. 19A is a flowchart that illustrates an audio query process 1900 of the IPAN 1100. The audio query process 1900 begins at start block 1940 where the PC IPAN client software 1532 is opened. In one embodiment, a portion of the PC IPAN client software 1532 is part of the "active tray" so that when a user turns the PC 1508 on, the PC IPAN client software 1532 is opened. Further, a portion of the PC IPAN client software 1532 is part of the IPAN plug-in so that when an Internet or other network connection is established, the PC IPAN client software 1532 runs in the background to query whether to add an audio file found on the Internet to the server site IPAN 1104. The process advances to a process block 1942 where the user finds a desired audio file as addressed by a URL. The user can search the Internet for audio without having to access the web site associated with the server site 1502. In a decision block 1944, the user is asked, through a menu, if the file is to be downloaded. If the process advances to a process block 1948, the user has decided to download the file now and the playlist is added to the IPAN 1100. At a process block 1950, the file has been downloaded and is available for playing. If the user decides "NO" (i.e. to down-

load the file at a later time or at the default time) the process advances to a process block 1946 to download the file at that default or more convenient time. The process then advances to a process block 1948 when the file is added to the IPAN 1100. The web site associated with the server site 1104 does not have to be opened. The PC IPAN client software 1532 will download the software to the hard drive of the PC 1508 and connect to the web site associated with the server site 1508 to upload the audio files. At the final process block 1950, the audio files will be available for playing.

FIG. 19B is a flowchart 1900 that begins at start block 1902 and illustrates the assignment of playlists to devices. The process advances from the start block 1902 to a process block 1904 where the user logs into the server site IPAN 1433. The process advances to the next process block 1908 where the user assigns a playlist to a first device 1510. In one embodiment, the playlist is stored in an SQL database and accessed via active server pages. After the active server pages access the SQL database, the playlist is downloaded to the first device 1510. The process then advances to a decision block 1908 where the process checks to see if all the songs in the playlist are stored in the first device's hard drive 1512. If all the songs in the playlist are already on the first device 1510, the songs on device 1510 are catalogued as being present. If songs need to be downloaded, the server site IPAN 1433 forms a list of remaining songs. In the next process block 1910, the server site IPAN 1433 compares the list of remaining songs to its records of the songs present on the device 1520 to see if the device 1520 has some of the necessary songs to complete the playlist formation. If the second device 1520 does have some of the remaining songs, the URLs of those songs, which are stored on the Server site IPAN, are provided to the first device 1510. The remaining songs which the second device 1520 does not have are deleted from the list of remaining songs and do not become part of the playlist. In the next process block 1914, the first device 1510 will download the songs from the URLs provided to it by server site IPAN 1433. The first device 1510 downloads all of the remaining songs needed for the playlist from the second device's 1520 URL's, but if all the songs are not on the second device's 1520 playlist, the first device 1510 will either get them from another device or in the worst case compose a playlist from only the songs that could be retrieved.

In the decision block 1916, the process determines if any URLs are broken. If A is unable to download the files from the URLs, the server site IPAN 1433 will upload the files to the server site in process block 1920, store the files in the interim, and download the files to the first device 1510 in process block 1922 the next time the first device 1510 calls in. For instance, the first device 1510 can be located on the east coast, and the second device 1520 can be located on the west coast. The first device 1510 may be assigned a playlist that is stored on the disk drive 1522 of the second device 1520. When the first device connects (e.g., at 2 a.m.) to the server site IPAN 1433, the first device will receive the URL's for the location where the second device 1520 downloaded the audio files and now the first device 1510 can download the audio files. If the URLs are broken, the first device 1510 will disconnect. When the second device 1520 calls in three hours later at 2 a.m. Pacific Time, the server site IPAN 1433 will upload the audio files to the server site 1104 and store the files on the disk space 1506. When the first device 1510 connects at 2 a.m. the following evening, the audio files will be ready to download from the server site 1104 to the first device 1510. The audio files will finally be stored on the disk space 1512.

At process block 1922, the songs that are present on the device 1510's storage space, the songs that have been down-

loaded from URL's to the device 1510, and the songs that have been uploaded to the device 1520 are catalogued in the IPAN 1100. In one embodiment, the songs are catalogued in the IPAN 1100 at the time that they are found. For instance, the songs that are on the device 1510's hard drive found at the process block 1908 can be catalogued in the IPAN 1100 at that time rather than at process block 1922. Further, the songs downloaded from URL's can be catalogued at process block 1916 or decision block 1916. Finally, the songs uploaded from the device 1520 can be catalogued at the time of uploading at process block 1918 or at the time of downloading at process block 1920. Optionally, delays in cataloguing can be used. In one embodiment, for example, the uploaded songs and the downloaded songs are all catalogued at process block 1920 whereas the songs present on the device 1510's storage space are catalogued at the decision block 1908.

FIG. 19C is a flowchart 1980 that illustrates another embodiment of the process of flowchart 1900. In one embodiment, the flowchart 1980 has process and decision blocks that handle an assignment of a playlist that includes songs not present on the device 1510. The process advances from the start block 1902 through 1908 in the same fashion as the process in flowchart 1900. In contrast to the process in flowchart 1900, the process then advances to decision block 1990 rather than 1910. At decision block 1990, if songs need to be downloaded, the server site IPAN 1433 checks its records to see if the device 1520 has all the necessary songs on the list of remaining songs to complete the playlist formation. If the device 1520 has none or some but not all of the necessary songs, the process advances to a process block 1950. At the process block 1950, the necessary songs that are not present on the device 1520 are catalogued in the new playlist with empty cone icons next to those songs. Optionally, the icon can be a symbol other than an empty cone. The playlist is not yet completely formed and will have additions of songs that are present on the device 1520 at a later point in the process. The process then advances to a process block 1952 and deletes songs that the device 1520 does not have from the list of remaining songs. The process then advances to decision block 1954 to determine if the list of remaining songs is empty. If the list of remaining songs is empty, then the process advances to process block 1922 where the songs present on the device 1510's storage space 1512 are catalogued in addition to the missing songs that are catalogued. In one embodiment, cataloguing does not include multiple entries for songs determined to be present at an earlier time. For instance, if a song is present on a device and is catalogued once as being present on the device, a multiple entry for the song being present on the device will not be made at a subsequent iteration of the process. If the list of remaining songs is not empty, the process advances to the process block 1912. At the process block 1912, the process in the flowchart 1980 proceeds in the same fashion as the process in flowchart 1900 until the process advances to the process block 1922. After all the songs (including the missing songs) are catalogued at the process block 1922, the process advances to the process block 1960 where the list of remaining songs is deleted. At the process block 1962, if the playlist does not contain any songs with an empty cone icon, the playlist is complete and the process advances to the end process block 1924. If the playlist contains any songs with an empty cone icon, the process advances to the decision block 1964 to allow the user to delete the missing songs. If the user deletes the missing songs, the playlist is complete, and the process advances to the end process block 1924. If the user decides not to delete the missing songs, a new list of remaining songs is created con-

sisting of the missing songs not deleted by the user. The process then advances to the decision block 1990.

At the decision block 1990, if the device 1520 initially had all the remaining songs on the playlist, the process 1980 proceeds in the same fashion as the process 1900. In one embodiment, if the process advanced from the process block 1966 rather than 1908, the missing songs have been added to the storage space 1522 of the device 1520 so that the playlist can now be complete. The process advances through iterations until all the songs present on the playlist are present on the storage space 1512 of the device 1510 or until the user deletes songs from playlist so that no missing songs are present. In one embodiment, the process advances from the process block 1966 to the decision block 1908 in order to check whether the missing songs have been added to the storage space 1512 of the device 1510 or the storage space 1522 of the device 1520 so that the playlist can now be complete.

In one embodiment, the IPAN 1100 includes a network connection so that the first device 1510 and the second device 1520 can have audio files downloaded from the first device 1510 to the second device 1520 almost instantaneously after the assignment of an audio file to the device 1510. For example, in a home network, the device 1510 does not need to connect to the Internet and can retrieve the necessary file through the network connection.

FIGS. 20A-20F illustrate the use of the action button 1210 on the network-enabled audio devices 1200 or 1300. FIG. 20A illustrates the screen display 1802 before the action button 1210 has been pressed. In one embodiment, the action button 1210 can be pressed when an audio source (e.g. an audio source in MP3 file format) with an unidentified artist is playing. Optionally, the action button 1210 can be pressed when an audio source in MP3 file format with an identified artist is playing. Optionally, the action button 1210 can be pressed for audio sources such as, for example, streaming audio, files in WMA file format, CDs, etc. The menu buttons 1821-1825 represent the functions that can be performed on the given audio source before the action button 1210 is pressed. For an MP3 file, for example, the menu buttons 1821-1825 correspond to a "pause" function, a "next" function, a "previous" function, an "add favorites" function, and a "stop" function. After the action button 1210 is pressed, the menu buttons 1821-1825 change context to perform functions that provide additional information on the given audio source and artist. Further, after the action button 1210 is pressed, the artist will no longer be shown as "unknown" because the audio source will be uploaded to a server for analysis to determine the identification of the artist. The server will download the identity of the artist in addition to other information concerning the audio source.

FIG. 20B illustrates the screen display 1802 after the action button 1210 has been pressed. The "unknown" artist in FIG. 20A has been determined to be "Moby," and the unidentified MP3 file has been identified as "Porcelain." The menu buttons 1821-1825 correspond to menu items that provide information on, or related to, the audio source. A title menu 2002 is provided to indicate the location in the directory of action button options that the user has chosen. If the user is at the beginning of the action button directory structure, the screen display 1802 illustrates the text "action" in the title menu 2002.

The menu buttons 1821-1825 correspond to the menu items "news," "music," "tour," "offers," and "done." By choosing the menu item "news," information will be presented to the user of current events regarding the artist and/or the given audio source. For instance, the "news" function can

display Billboard top 40 information, clothing lines introduced by the artist, new albums, etc. The menu button 1822 corresponding to the "music" menu item provides the user access to other audio sources from a given artist. The menu button 1823 corresponding to the "tour" menu item allows the user to get up-to-date information on tours that the artist is going on. The menu 1824 corresponds to the "offers" menu item which allows the user to receive information on merchandise, promotional items, etc. for the given artist. The menu button 1825 corresponding to the "done" menu item allows a user to turn off the action button 1210.

FIG. 20C illustrates the screen display 1802 after the menu item "music" has been chosen. The menu path 2204 lists "action" to indicate to the user that the menu title "music" 2202 was a menu item chosen from the menu items illustrated in the screen shot denoted by the menu title "action." The menu buttons 1821-1825 correspond to the menu items "albums," "similar," "samples," "back," and "done." If the user selects the "albums" menu item the user will be able to view a list of other albums by the artist of the audio source. In one embodiment, the server downloads the albums listing when the action button 1210 is pressed for the first time. Optionally, the server downloads additional information after the user selects one of the menu buttons 1821-1825. When the user presses the menu button 1822, the "similar" menu item is chosen and a listing of albums that are from a genre of music similar to that of the audio source or from artists that are in some way similar to the artist of the audio source is presented. If the "similar" menu item is performed on Moby and "Porcelain," a list of techno songs from Moby and/or techno songs from other artists can be presented. If the user presses the menu button 1823 corresponding to the "samples" menu item, audio samples from the artist will be presented. If the user presses the menu button 1824 corresponding to the "back" menu item, the location illustrated in the menu title is returned to. If the user presses the menu button 1825 corresponding to the "done" menu item, the action button 1210 is turned off.

FIG. 20D illustrates the screen display 1802 after the menu item "albums" has been chosen. The menu path 2204 lists "action/music" to indicate to the user that the menu title "albums" 2202 was a menu item chosen from the menu items illustrated in the screen shot denoted by the menu title "music." The menu buttons 1821-1824 correspond to different albums for the given artist. FIG. 20D illustrates four of Moby's albums: "Moby," "Ambience," "Everything is Wrong," and "Animal Rights." The menu button 1825 corresponds to the "done" function which allows the user to turn the action button 1210 off.

FIG. 20E illustrates the screen display 1802 after the menu item "Ambient" is chosen on the screen display 1802 illustrated in FIG. 20D. The menu path 2204 action/music/albums shows that "Ambient" was chosen from the menu title "albums" 2202. The menu item "buy" is chosen to purchase the album "Ambient." The menu item "download" is chosen to download the "Ambient" album. The menu item "listen" is pressed to allow the user to listen to the album. The menu item "back" allows the user to access the previous menu title. To reach the screen shot with the menu title "albums" from the menu title "Ambient," the user chooses the "back" menu item. The user can turn the action button off by pressing the "done" menu item.

FIG. 20F illustrates the screen display 1802 after the user determines to buy the album illustrated in FIG. 20E. The menu path action/music/albums/buy indicates that the user chose the "buy" menu item in FIG. 20E. The title menu 2202 "complete" is used at the end of the transaction. The menu

item "buy" can be chosen to allow the user to complete the transaction. To reach the screen shot with the menu title "Ambient" from the menu title "Complete," the user chooses the "back" menu item. The menu button 1825 corresponds to the menu item "done" which allows the user to turn the action button 1210 off.

In FIG. 20B, if the menu item "news" is chosen by the user, the subsequent screen will display the menu path "action," the menu title "news," and the menu items: "listen," "read," "log to myactions," "back," and "done." If the user chooses the menu item "read," a subsequent screen displays the menu path "action/news," the menu title "read," and the menu items "log to myactions," "back," and "done." If the user chooses the menu item "log to myactions," information about a particular artist or a particular audio source will be stored in a log for future reference. The displayed menu path will be "action/news/to myactions," the menu title will be "complete," and the menu items will be "back" and "done."

If instead of reading the news, the user would like to listen to the "news," the "listen" menu item can be chosen in the screen displaying the "action" menu path and the "news" menu title. The next screen will display the "action/news" menu path and the "listen" menu title. The screen will also alert the user as to the status of the retrieval of the news. The menu items include "log to myactions," "back" and "done."

In FIG. 20C, the user can choose the menu item "samples" so that the next screen displays the menu path "action/music," the menu title "samples," and the menu items which include different audio source samples. After the user chooses a sample from the menu items of samples, a screen displays the menu path "action/music/samples," the title menu "Ambient," and the menu items "buy," "download," "listen," "back," and "done." If the user chooses to select the "buy" menu item, the next screen displays the menu path "action/music/samples/buy," the menu title "complete," and the menu items "back," and "done."

In FIG. 20B, if the user decides to select the menu item "tour," the next screen will display the menu path "action," the menu title "tour," and the menu items "appearing," "log to myactions," "back," and "done." If the user selects the menu item "appearing," the next screen will display a location or locations of tours for the given artist. For example, when the user presses "tour" for "Moby," the screen can display "Dec. 13, 2000 Verizon Amphitheater Irvine Calif." The screen will also display the menu title "appearing" and the menu items "log to myactions," "back," and "done." If the user selects the "log to myactions" menu item, the next screen displays the menu path "action/tour/appearing," the menu title "complete" and the menu items "log to myactions," "back," and "done."

In FIG. 20B, if the user selects the "offers" menu item, the next screen displays the menu path "action," the menu title "offers," and the menu items "merch," "special," "back," and "done." If the user selects the menu item "merch," the next screen displays the menu path "action/offers," the menu title "merchandise," and the menu items "item one," "item two," "item three," "back," and "done." If the user selects the menu item "item one," the next screen displays the menu path "action/offers/merchandise," "item one," and the menu items "buy," "log to myactions," "back," and "done." If the user selects "buy," the next screen displays the menu path "action/offers/merchandise/buy," the menu title "complete," and the menu items "buy," "back," and "done." The screen also displays the artist and the item selected. For example, the screen displaying "Moby, Item 1" indicates that the user bought Item 1 by Moby. If instead of buying Item 1, the user wishes to keep a log of Item 1 for future reference, the user can upload that

future reference to a server. For instance, in the next screen, the menu path can be "action/offers/merchandise/to myaudioreamp." The menu title is "complete," and the menu items are "back" and "done."

In FIG. 20C, if the user decides to choose "similar" music, the next screen displays the menu path "action/music," the menu title "similar," and the menu items that include audio sources similar to that of the artist with the given audio source. Menu items that can appear on the screen for "Moby," for example, are "808 state," "air," "aphex," "back," and "done." If the user decides to select the menu item "808 state," the next screen displays the menu path "action/music/similar," the menu title "808 state," the menu items "buy," "download," "listen," "back," and "done." If the user decides to buy "808 state," the next screen displays the menu path "action/music/similar/buy," the menu title "complete," and the menu items "back" and "done."

In FIG. 20C, if the user decides to select the menu item "samples," the next screen displays the menu path "action/music," the menu title "samples," and the menu items that include audio source samples of the given album. The menu items for "Moby" can include "Moby," "Ambient," "Everything is Wrong," "Animal Rights," and "done."

In FIG. 20C, if the user selects the menu item "similar," the next screen displays the menu path "action/music/similar," the menu title "listen," and the menu items "back" and "done." The user can also choose to download the similar music. The next screen displays the menu path "action/music/similar," the menu title "download," and the menu items "back" and "done."

In FIG. 21, after the action button 1210 is pressed, the audio-enabled device 1200 or 1300 can at times play advertisements. For a Nike advertisement, the text "Nike" would be displayed on the first line of the screen. The text of the advertisement, such as "radio free Sydney, air max knukini offer," can be displayed underneath the "Nike" text. The menu title "action" 2002 is displayed and the menu items "buy," "log to myactions," "more info," "offers," and "done" are displayed. If the user decides to buy the products offered in the advertisement, the next screen displays the menu path "action/buy," the menu title "complete," the menu items "back" and "done," and the advertisements are displayed. If the user decides instead to store the offer for a future reference, the menu path "action/to myaudioreamp" is displayed in addition to the menu title "complete," and the menu items "back" and "done" are displayed. If the user wishes to receive more information, the "more info" menu item can be chosen. The menu path "action/more info," the menu title "more info," and the menu items "buy," "log to myactions," "offers," and "done" are displayed.

While the above description contains many specifics, these should not be construed as limitations on the scope of the invention, but rather as an exemplification of preferred embodiments thereof. The various user controls and buttons can be relocated, combined, reconfigured, etc. Most of the user controls and buttons can even be omitted entirely in favor of voice-activated commands. One skilled in the art will recognize that many of the various features, and capabilities described in connection with the intelligent radio 100, are also applicable to other embodiments as well, including the embodiments described in connection with FIGS. 7-10 and the network-enabled audio device in FIGS. 13A-21. One skilled in the art will also recognize that other embodiments are contemplated, including, for example, handheld intelligent radios, and intelligent radios for boats, cars, trucks, planes, and other vehicles, etc.

One skilled in the art will recognize that these features, and thus the scope of the present invention, should be interpreted in light of the following claims and any equivalents thereto.

The invention claimed is:

1. A method comprising:
  - assigning a playlist to an electronic device, the playlist identifying a plurality of songs;
  - identifying ones of the plurality of songs in the playlist that are not stored on the electronic device;
  - providing the playlist to the electronic device; and
  - providing information to the electronic device enabling the electronic device to obtain the ones of the plurality of songs that are not stored on the electronic device from at least one remote source.
2. The method of claim 1 wherein the electronic device is one of a plurality of associated electronic devices, and providing the information to the electronic device comprises:
  - identifying at least one other of the plurality of associated electronic devices hosting the ones of the plurality of songs, wherein the at least one other of the plurality of associated electronic devices is the at least one remote source; and
  - providing information to the electronic device enabling the electronic device to obtain the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices.
3. The method of claim 1 wherein the electronic device is one of a plurality of associated electronic devices and the at least one remote source is at least one other of the plurality of associated electronic devices, and the method further comprises:
  - receiving a request for the ones of the plurality of songs from the electronic device;
  - obtaining the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and
  - providing the ones of the plurality of songs to the electronic device.
4. The method of claim 1 wherein the electronic device is one of a plurality of associated electronic devices and the at least one remote source is at least one other of the plurality of associated electronic devices, the method further comprising:
  - receiving a request for the ones of the plurality of songs from the electronic device if the electronic device is unable to connect to the at least one other of the plurality of associated electronic devices to obtain the ones of the plurality of songs;
  - obtaining the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and
  - providing the ones of the plurality of songs to the electronic device.
5. The method of claim 1 wherein the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained, and providing the information to the electronic device comprises providing information to the electronic device enabling the electronic device to obtain the ones of the plurality of songs from at least one web site.
6. The method of claim 1 wherein the electronic device is one of a plurality of electronic devices associated with a user, and assigning the playlist to the electronic device comprises:
  - enabling the user to compose the playlist; and
  - enabling the user to assign the playlist to the electronic device selected from the plurality of electronic devices.
7. The method of claim 1 wherein the electronic device is one of a plurality of electronic devices associated with a

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personal audio network comprising the plurality of electronic devices, a personal audio network client, and a personal audio network server, and assigning the playlist to the electronic device comprises:

enabling a user to interact with the personal audio network server via the personal audio network client to compose the playlist; and

enabling the user to interact with the personal audio network via the personal audio network client to assign the playlist to the electronic device selected from the plurality of electronic devices.

8. The method of claim 7 wherein the personal audio network server stores the playlist, and:

providing the playlist to the electronic device comprises transferring the playlist from the personal audio network server to the electronic device; and

providing the information to the electronic device comprises providing information from the personal audio network server to the electronic device enabling the electronic device to obtain the ones of the plurality of songs that are not stored on the electronic device from the at least one remote source.

9. A method comprising:

receiving, at an electronic device, a playlist assigned to the electronic device, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;

receiving, at the electronic device, information enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source; and

obtaining the ones of the plurality of songs from the at least one remote source.

10. The method of claim 9 wherein the electronic device is one of a plurality of associated electronic devices and the at least one remote source is at least one other of the plurality of associated electronic devices, and obtaining the ones of the plurality of songs comprises:

requesting the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and

receiving the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices.

11. The method of claim 9 wherein the electronic device is one of a plurality of associated electronic devices and the at least one remote source is at least one other of the plurality of associated electronic devices, and obtaining the ones of the plurality of songs comprises:

providing a request for the ones of the plurality of songs to a central server, wherein in response to the request, the central server uploads the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and

receiving the ones of the plurality of songs from the central server.

12. The method of claim 9 wherein the electronic device is one of a plurality of associated electronic devices and the at least one remote source is at least one other of the plurality of associated electronic devices, and obtaining the ones of the plurality of songs comprises:

determining whether the electronic device is unable to connect to the at least one other of the plurality of associated electronic devices to obtain the ones of the plurality of songs;

if the electronic device is unable to connect to the at least one other of the plurality of associated electronic devices:

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providing a request for the ones of the plurality of songs to a central server, wherein in response to the request, the central server uploads the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and

receiving the ones of the plurality of songs from the central server; and

if the electronic device is able to connect to the at least one other of the plurality of associated electronic devices:

requesting the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices; and

receiving the ones of the plurality of songs from the at least one other of the plurality of associated electronic devices.

13. The method of claim 9 wherein the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained, and obtaining the ones of the plurality of songs comprises:

requesting the ones of the plurality of songs from the at least one web site; and

receiving the ones of the plurality of songs from the at least one web site.

14. The method of claim 9 wherein the electronic device is one of a plurality of electronic devices associated with a personal audio network comprising the plurality of electronic devices and a personal audio network server, and

receiving the playlist assigned to the electronic device comprises receiving the playlist from the personal audio network, wherein the personal audio network server enables a user to assign the playlist to the electronic device; and

receiving the information comprises receiving information from the personal audio network server enabling the electronic device to obtain the ones of the plurality of songs from the at least one remote source.

15. A system comprising:

a) a plurality of electronic devices; and

b) a central system communicatively coupled to the plurality of electronic devices via a network, and adapted to:

i) assign a playlist to one of the plurality of electronic devices, the playlist identifying a plurality of songs;

ii) identify ones of the plurality of songs in the playlist that are not stored on the one of the plurality of electronic devices;

iii) provide the playlist to the one of the plurality of electronic devices; and

iv) provide information to the one of the plurality of electronic devices enabling the one of the plurality of electronic devices to obtain the ones of the plurality of songs from at least one remote source.

16. The system of claim 15 wherein the central system is further adapted to:

identify at least one other of the plurality of electronic devices hosting the ones of the plurality of songs, wherein the at least one remote source is the at least one other of the plurality of electronic devices; and

provide information to the one of the plurality of electronic devices enabling the one of the plurality of electronic devices to obtain the ones of the plurality of songs from the at least one other of the plurality of electronic devices.

17. The system of claim 15 wherein the at least one remote source is at least one other of the plurality of electronic devices, and the central system is further adapted to:

receive a request from the one of the plurality of electronic devices for the ones of the plurality of songs;

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obtain the ones of the plurality of songs from the at least one other of the plurality of electronic devices; and provide the ones of the plurality of songs to the one of the plurality of electronic devices.

18. The system of claim 15 wherein the at least one remote source is at least one other of the plurality of electronic devices, and the central system is further adapted to:

receive a request from the one of the plurality of electronic devices for the ones of the plurality of songs if the one of the plurality of electronic devices is unable to connect to the at least one other of the plurality of electronic devices to obtain the ones of the plurality of songs;

obtain the ones of the plurality of songs from the at least one other of the plurality of electronic devices in response to the request; and

provide the ones of the plurality of songs to the one of the plurality of electronic devices.

19. The system of claim 15 wherein the at least one remote source is at least one web site from which the ones of the plurality of songs had previously been obtained.

20. The system of claim 15 wherein the plurality of electronic devices are associated with a user, and the control system is further adapted to enable the user to assign the playlist to the one of the plurality of electronic devices.

21. The system of claim 20 wherein the central system is further adapted to enable the user to compose the playlist.

22. The system of claim 15 wherein the one of the plurality of electronic devices is further adapted to:

receive the playlist assigned to the one of the plurality of electronic devices from the central system;

receive the information from the central system enabling the one of the plurality of electronic devices to obtain the ones of the plurality of songs from the at least one remote source; and

obtain the ones of the plurality of songs from the at least one remote source.

23. The system of claim 22 wherein the at least one remote source is at least one other of the plurality of electronic devices, and in order to obtain the ones of the plurality of songs, the one of the plurality of electronic devices is further adapted to:

request the ones of the plurality of songs from the at least one other of the plurality of electronic devices; and

receive the ones of the plurality of songs from the at least one other of the plurality of electronic devices.

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24. The system of claim 22 wherein the at least one remote source is at least one other of the plurality of electronic devices, and in order to obtain the ones of the plurality of songs, the one of the plurality of electronic devices is further adapted to:

provide a request for the ones of the plurality of songs to the central system, wherein in response to the request, the central system uploads the ones of the plurality of songs from the at least one other of the plurality of electronic devices; and

receive the ones of the plurality of songs from the central system.

25. The system of claim 22 wherein the at least one remote source is at least one other of the plurality of electronic devices, and in order to obtain the ones of the plurality of songs, the one of the plurality of electronic devices is further adapted to:

determine whether the one of the plurality of electronic devices is unable to connect to the at least one other of the plurality of electronic devices to obtain the ones of the plurality of songs;

if the one of the plurality of electronic devices is unable to connect to the at least one other of the plurality of electronic devices:

provide a request for the ones of the plurality of songs to the central system, wherein in response to the request, the central system uploads the ones of the plurality of songs from the at least one other of the plurality of electronic devices; and

receive the ones of the plurality of songs from the central system; and

if the electronic device is able to connect to the at least one other of the plurality of electronic devices:

request the ones of the plurality of songs from the at least one other of the plurality of electronic devices; and

receive the ones of the plurality of songs from the at least one other of the plurality of electronic devices.

26. The system of claim 15 further comprising a personal audio network client, wherein the central system is a personal audio network server communicatively coupled to the personal audio network client and the plurality of electronic devices, and the personal audio network server is further adapted to enable the user to compose the playlist and assign the playlist to the one of the plurality of electronic devices via the personal audio network client.

\* \* \* \* \*

# **EXHIBIT 6**

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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YAMAHA CORPORATION OF AMERICA  
Petitioner

v.

BLACK HILLS MEDIA, LLC  
Patent Owner

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Case IPR2013-00594  
Patent 8,050,652 B2

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**NOTICE OF DEPOSITION OF  
V. MICHAEL BOVE, JR.**

***Mail Stop "PATENT BOARD"***  
Patent Trial and Appeal Board  
U.S. Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450





*NOTICE OF DEPOSITION OF V. MICHAEL BOVE, JR.*

In accordance with 37 C.F.R. § 42.53, Patent Owner Black Hills Media, LLC provides notice to Petitioner Yamaha Corporation of America that the deposition of V. Michael Bove, Jr. will be held Friday, May 30, 2014, commencing at 9:00am in the offices of Pepper Hamilton LLP, 125 High Street, 19<sup>th</sup> Floor – High Street Tower, Boston, MA 02110-2736. The deposition will be recorded by stenographic and audiovisual (videotape) means before an officer duly authorized by law to administer oaths under 35 U.S.C. § 23.

Pursuant to 37 C.F.R. § 42.53(d)(1), the parties have conferred and have agreed on this date and location for the deposition.

Respectfully submitted,

/Thomas Engellenner/

Thomas Engellenner (Reg. No. 28,711)  
Lead Attorney for Patent Owner Black Hills  
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Date: April 25, 2014  
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(617) 204-5100

**CERTIFICATE OF SERVICE**

The undersigned hereby certifies that the above-captioned "Notice of Deposition of V. Michael Bove, Jr." was served in its entirety on April 25, 2014, via email upon the following counsel of record for the Patent Owner:

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Respectfully submitted,

/Thomas Engellenner/

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# **EXHIBIT 7**

Patent No. 8,050,652  
Petition For *Inter Partes* Review

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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Yamaha Corporation of America  
Petitioner

v.

Black Hills Media, LLC  
Patent Owner

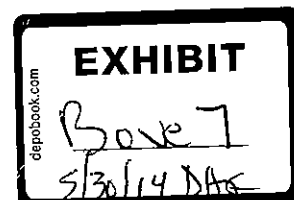
Patent No. 8,050,652  
Issue Date: November 1, 2011  
Title: METHOD AND DEVICE FOR AN  
INTERNET RADIO CAPABLE OF OBTAINING  
PLAYLIST CONTENT FROM A CONTENT SERVER

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*Inter Partes* Review No. \_\_\_\_\_

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**DECLARATION OF V. MICHAEL BOVE, JR.**



I, V. Michael Bove, Jr., make this declaration in connection with the proceeding identified above.

## **I. INTRODUCTION**

1. I have been retained by counsel for Yamaha Corporation of America (“Yamaha”) as a technical expert in connection with the proceeding identified above. I submit this declaration in support of Yamaha’s Petition for *Inter Partes* Review of United States Patent No. 8,050,652 (“the ‘652 patent”).

2. I am being paid at an hourly rate for my work on this matter. I have no personal or financial stake or interest in the outcome of the present proceeding.

## **II. QUALIFICATIONS**

3. I am employed as a Principal Research Scientist at the Massachusetts Institute of Technology, where I am also currently head of the Object-Based Media group at the Media Laboratory, co-director of the Center for Future Storytelling, and co-director of the consumer electronics working group CE2.0. I was also co-founder of and technical advisor to WatchPoint Media, Inc., an interactive television products and services company with offices in Lexington, Massachusetts and London, England, which is now part of Ericsson. I currently serve as technical advisor to One Laptop Per Child, creators of an inexpensive laptop computer for children in developing nations.

4. I hold an S.B. in Electrical Engineering, an S.M. in Visual Studies, and a Ph.D. in Media Technology, all from the Massachusetts Institute of Technology. I have authored over ninety journal and conference papers on distributed media, interactive media, and digital media. I have supervised over fifty graduate theses, and since 1990 have taught a graduate subject at MIT called Signals, Systems, and Information for Media Technology. I am a Fellow of the Society of Photo-Instrumentation Engineers, a member of the Board of Editors of the Journal of the Society of Motion Picture and Television Engineers, and a member of a number of other professional organizations including the Optical Society of America, the Association for Computing Machinery, and the Institute of Electrical and Electronic Engineers. I am a named inventor on seventeen U.S. patents. I served as General Chair of the 1996 ACM Multimedia Conference and of the 2006 IEEE Consumer Communications and Networking Conference (CCNC'06). Attached as Appendix A is a copy of my curriculum vitae.

### **III. MATERIALS CONSIDERED**

5. In preparing this declaration, I have reviewed, among other things, the following materials: (a) the '652 patent and its prosecution history; (b) U.S. Patent No. 6,587,127 ("Leeke"); (c) PCT Application No. PCT/US99/01001 ("Qureshey"); (d) U.S. Patent No. 6,502,194 ("Berman"); (e)

reference material relating to the Lansonic DAS-750 (“Lansonic”); and (f) the Petition for *Inter Partes* Review of the '652 patent to which my declaration relates.

#### **IV. DEFINITIONS AND STANDARDS**

6. I have been informed and understand that claims are construed from the perspective of one of ordinary skill in the art at the time of the claimed invention, and that during *inter partes* review, claims are to be given their broadest reasonable construction consistent with the specification.

7. I have also been informed and understand that the subject matter of a patent claim is obvious if the differences between the subject matter of the claim 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 to which the subject matter pertains. I have also been informed that the framework for determining obviousness involves considering the following factors: (i) the scope and content of the prior art; (ii) the differences between the prior art and the claimed subject matter; (iii) the level of ordinary skill in the art; and (iv) any objective evidence of non-obviousness. I understand that the claimed subject matter would have been obvious to one of ordinary skill in the art if, for example, it results from the combination of known elements according to known methods to yield predictable results, the simple substitution of one known element for another to obtain predictable results, use of a known technique to improve

similar devices in the same way or applying a known technique to a known device ready for improvement to yield predictable results. I have also been informed that the analysis of obviousness may include recourse to logic, judgment and common sense available to the person of ordinary skill in the art that does not necessarily require explication in any reference.

8. In my opinion, a person of ordinary skill in the art pertaining to the '652 patent would have at least a bachelor's degree in computer science or electrical engineering, and at least one year of practical experience with networked multimedia.

9. I have been informed that the relevant date for considering the patentability of the claims of the '652 patent is November of 2000. Based on my education and experience in the fields of networked digital media and consumer electronics, I believe I am qualified to provide opinions about how one of ordinary skill in the art in 2000 would have interpreted and understood the '652 patent and the prior art discussed below.

## **V. THE '652 PATENT**

10. The claims of the '652 patent are directed to a system and method for a networked electronic device that receives and plays digital audio from sources including Internet radio and a content source with a playlist. The device



receives information enabling the device to obtain the songs in the playlist from a remote source and then plays the songs.

## VI. CLAIM CONSTRUCTION

11. I have been asked to provide my opinion on two claim terms: “playlist assigned to the electronic device” and “wherein ones of the plurality of songs are not stored on the electronic device,” by discussing what one of ordinary skill in the art at the time of the patent filing would regard as their broadest reasonable interpretation consistent with the specification. In each case my opinion agrees with the position taken in Yamaha’s Petition for *Inter Partes* Review.

### A. “playlist assigned to the electronic device”

12. The term “playlist assigned to the electronic device” appears in independent claims 1, 21, and 42.

13. My opinion is that one of ordinary skill in the art would understand “playlist assigned to the electronic device” to be a list of songs that is to be transferred to a particular device selected by the user.

14. First, the normal grammatical reading of “assigned to” in my opinion refers to a designation of something to a particular entity, such as for example assignment of a project to a particular person. This normal understanding is consistent with the written description contained in the '652 patent. Discussion

of the assignment of playlists to devices occurs in a number of places, including, but not limited to, 4:50-5:3, 21:40-23:5, 24:44-60, and 28:11-30:26. The process is also illustrated in FIG. 17C (specifically, elements 1761 and 1762), and FIGS. 19B and 19C1 (element 1906). In each of these places, the assignment is initiated by the user, and is made to a specific user-selected device. It is notable that the menu selection in FIG. 17C and discussed in 24:50-53 is “Make Available On,” designating a particular device to which the playlist will become available, rather than simply “Make Available,” “Export,” or some equivalent non-directed language.

**B. “wherein ones of the plurality of songs are not stored on the electronic device”**

15. Independent claims 1, 21, and 42 contain the term “wherein ones of the plurality of songs are not stored on the electronic device.”

16. It is my opinion that this claim limitation simply describes a situation in which the storage in the electronic device does not already contain all the songs in the playlist at the time that the playlist is received. It implies by its language that the device contains memory that can store songs and excludes a situation in which the device does not contain local storage for songs. Otherwise, the statement that ones of the songs are not stored on the device becomes a tautology. If the device has no memory for storing songs it is of course a fact that

not only “ones,” but rather *all* songs in every instance will not be stored on the device. In my opinion such reading does not make sense, when considered in connection with the '652 specification.

17. While the “Summary of the Invention” section beginning at 3:57 briefly describes two possible implementations that do not contain enough song storage to hold all the songs on the playlist, in my opinion these are not relevant to any assignment of a playlist to a device, as recited in claims 1, 21, and 42. More specifically, one implementation is storage-less: “the network-enabled audio device comprises speakers, an AC power line, and a network line,” (3:61-62) which one of ordinary skill in the art would understand as a networked remote output for another music player, not itself a device to which a playlist could be assigned. The other implementation in that discussion (two sentences beginning at 4:4-9) has a limited amount of memory: “In one embodiment, the network-enabled audio device does not have any storage space other than memory. This embodiment provides for a low-cost system that can play songs from playlists stored on the IPAN Manager or on the PC’s storage space without having to store the audio files locally.” I understand this implementation to be a variation of the previous one with the addition of a small amount of buffer memory; again, the playlist is not “assigned” to the device but instead resides on another device which

simply uses this device for output. Therefore, I believe that these isolated statements have nothing to do with assigning playlists.

18. In contrast, other parts of the '652 patent specification include extensive discussion of assignment of playlists and, in those discussions, the devices to which playlists are assigned need to have enough memory to store the playlists and songs. Discussion in the specification of assigning playlists to “network-enabled audio devices” (21:40-22:15) describes devices to which playlists can be assigned as, “[e]ach network-enabled audio device 1510 has a storage space 1512 for network-enabled audio device IPAN software 1526, a playlist 1528, and associated URL’s and songs within the playlist. Similarly, each network-enabled audio device 1520 has a storage space 1522 for network-enabled audio device IPAN software 1526, a playlist 1528, and associated URL’s and songs within the playlist.” The detailed discussion at 22:36-58, 24:44-25:2 and 28:11-30:26 is similar. Thus devices to which playlists are assigned need to have enough memory to store the playlists and songs.

## **VII. ANALYSIS OF PRIOR ART**

### **A. Leeke**

19. I have been asked as to my opinion as to whether claims 1, 2, 4, 6, 7, 10, 11, 13, 14, 21, 22, 24, 25, 28, 31, 32, 34, 35, 42, 43, 45, 47, 48, 52, 53, 55, and 56 of the '652 patent would have been obvious to one of skill in the art in light

of the Leeke reference, if the claim term “playlist assigned to the electronic device” is construed as requiring user selection of a specific device (as discussed in Section VI above). Initially, it is my opinion that each of the elements of these claims are disclosed in Leeke as set forth in the claim chart contained in the '652 petition under a broad construction of this term and the claims are anticipated under such construction. Under the narrower construction, it is my opinion that the claims would have been obvious in view of Leeke.

20. In conjunction with this issue, I note that the Leeke reference states at 20:35-42 that playlists can be transferred between users and to plural access points of one user. In my opinion, in view of this disclosure it would have been obvious that a playlist can be assigned to a device by making a selection of a specific device. This is especially so in view of the disclosure of virtual smart cards and the statement that playlists can reside on the storage device of the server as indicated at 17:23-33.

**B. Qureshey In Combination With Berman**

21. I have been asked as to my opinion regarding whether it would have been obvious to one of ordinary skill in the art to combine the audio-on-demand aspect of the Berman reference with the system disclosed in the Qureshey reference. I do so find.

22. Both these references relate to the field of consumer electronics products, and both describe networked home audio devices that obtain audio from remote sources via the Internet. One of ordinary skill in the art would have understood that the same network interface could be used for connecting to audio-on-demand as well as Internet radio services (this would indeed be the case around the time of the alleged invention whereby a PC could access both services through a Web browser) and that the changes needed to add audio-on-demand to an Internet radio receiver (or Internet radio functionality to an audio-on-demand player) would, for the most part, only involve modifying the user interface software to allow selecting between the functions, and programming additional server addresses into the system.

23. I have reviewed the claim charts in the '652 petition and it is my opinion that each of the elements of the claims are disclosed in Qureshey and Berman as set forth in the charts. In view of this and my opinion in paragraph 21 regarding the obviousness of combining the features of Qureshey and Berman, it is my opinion that claims 1-4, 6-8, 10, 13, 21, 22, 24-29, 31, 42-45, 47-50, and 52 would have been obvious.

**C. Qureshey In Combination With Berman And Leeke**

24. I have reviewed the claim charts in the '652 petition with respect to claims 11, 32, and 53 and it is my opinion that each of the elements of the

claims are disclosed in Qureshey and Berman as set forth in the charts. In view of this and my opinion in paragraph 21 regarding the obviousness of combining the features of Qureshey and Berman, it is my opinion that claims 11, 32, and 53 would have been obvious in view Qureshey and Berman in view of Leeke. Leeke discloses the provision of supplemental information in response to a request. In my opinion it would have been obvious to one of ordinary skill in the art to provide supplemental information in Berman in response to a request, as such is simply applying a known technique to a known device.

**D. Lansonie**

25. I have been asked as to my opinion on whether claims 1, 2, 3, 4, 6, 7, 10, 21, 22, 24, 25, 27, 28, 29, 31, 42, 43, 44, 45, 47, 48, and 52 of the '652 patent would have been obvious to one of ordinary skill in the art in view of Lansonie if each Web page constitutes a single reference. As a preliminary matter, it is my opinion that all of the elements of the claims are disclosed in the Web pages as set forth in the claim charts in the '652 petition. If the multiple Web pages making up the Lansonie disclosure do not constitute a single reference, it is my opinion that one of ordinary skill in the art would have immediately understood that all the pages were describing features of a single device, and would have found it obvious to consider the multiple disclosed features as part of a single device that would

render claims 1, 2, 3, 4, 6, 7, 10, 21, 22, 24, 25, 27, 28, 29, 31, 42, 43, 44, 45, 47, 48, and 52 obvious.

26. I note that claims 1, 21, and 42 recite “receiv[ing] information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source.” I have been asked as to my opinion as to Lansonic on whether, when playing songs stored on a remote device by selecting a playlist, the selected playlist contains information enabling the device to obtain the songs from the remote source. It is my opinion that in order for the device to play songs on a playlist that are stored on a remote device, the playlist necessarily has information enabling the device to obtain the songs from the remote source. If such information were not there, the device would not be able to obtain the remotely stored songs. Therefore, one of ordinary skill in the art would have recognized that such information would be present in Lansonic.

27. I have further been asked to address the wireless remote control of claims 8, 26, and 49. Claims 8 and 26 depend from claims 1 and 21, respectively, and require that the networked audio device “receive input from a wireless remote control having a navigation shuttle,” while claim 49 depends from claim 42 and requires “receiving input from a wireless remote control that enables navigating the playlist.” I note first that the idea of using a remote control to navigate through a list of songs was well-known at the time of the alleged invention, having been in



use for many years in compact disc players. Moreover, it would be logical that the remote control would provide the same operability as the QuickSpin dial that is on the unit itself. Such operability includes navigation of playlists. It is therefore my opinion that claims 8, 26, and 49 would have been obvious to one of ordinary skill in the art at the time of the claimed invention.

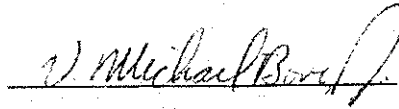
**E. White**

28. I have been asked to provide my opinion as to whether claims 1-4, 6, 7, 13, 21, 22, 24, 25, 27, 28, 34, 42-45, 47, and 48 would have been obvious to one of ordinary skill in the art in view of U.S. Patent No. 7,187,947 to White *et al.* ("White"). White discloses numerous embodiments that include various features. It is my opinion that each of the elements of the claims is disclosed in White as set forth in the claim chart contained in the '652 Petition. It is also my opinion that it would have been obvious to one of ordinary skill in the art that the features of the various embodiments could be implemented in a single device, as it is apparent that such features could be combined as deemed necessary or desirable. In view of this, it is my opinion that the above-identified claims would have been obvious in view of White.

\* \* \*

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and that 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: September 18, 2013



V. Michael Bove, Jr.

Last updated June 2013

Massachusetts Institute of Technology  
School of Architecture and Planning Personnel Record  
Victor Michael Bove, Jr.  
Media Arts and Sciences Program

*Date of Birth*  
23 December 1960

*Citizenship*  
United States of America

*Education*  
M.I.T., S.B. Electrical Engineering, June 1983  
M.I.T., S.M. Visual Studies, September 1985  
M.I.T., Ph.D. Media Technology, June 1989

*Title of Thesis for Most Advanced Degree*  
V. M. Bove, Jr., *Synthetic Movies Derived from Multi-Dimensional Image Sensors*, Ph.D. thesis, M.I.T., June 1989.

*Principal Fields of Interest*  
Applications of machine analysis to media-related applications (adding intelligence to live interpersonal communications and authored content), advanced user interfaces for consumer electronics, novel imaging hardware (in particular holographic television)

*Non-M.I.T. Experience*  
R.C.A. Microcomputer Products Division, Summer Student Employee, May 1980-Aug. 1980  
Co-Founder and Technical Advisor, WatchPoint Media, Inc., 1999-2003

*History of M.I.T. Appointments*  
Technical Assistant, May 1983-Sept. 1983  
Graduate Research Assistant, Sept. 1983-April 1989  
Postdoctoral Research Associate, April 1989-July 1989  
Assistant Professor of Media Technology, July 1989-July 1993  
Associate Professor of Media Technology, July 1993-July 1997

Principal Research Scientist, MIT Media Laboratory, July 1997-present

*Consulting Record*

Aware, Inc., July-Sept. 1991

Bell Northern Research, August 1991, August-Sept. 1995

Plaza Investment Managers, Inc., July-August 1992

World Book Publishing (encyclopedia revisions), March 1993

Van Nostrand Reinhold (book manuscript reviewing), April 1994-present

Analog Devices, Inc., July-August 1994

Blackside Productions, Inc. (consultant for the TV series "Breakthrough: People of Color in American Science"), October-December 1994

Axiom Venture Partners, Nov. 1995-March 1996

Data Translation Inc./Kenyon and Kenyon (consultant on patent case), March 1996

Naval Undersea Warfare Center, June 1996

Copyright Clearance Center, Inc., Sept. 1996-Sept. 1997

Artech House Publishers (book manuscript reviewing), 1996-2002

Research Grants Council of Hong Kong (proposal evaluator), Feb. 1997-present

Hughes Electronics (expert witness before International Trade Commission), Feb. 1997-July 1997

Mercury Computer, May 1997

Thomson Consumer Electronics (expert witness before International Trade Commission), June 1997-August 1998

Swedish Research Council for Engineering Sciences (proposal evaluator), August 1997

Texas Instruments, 1998-2003

Cirrus Logic, Inc., Dec. 1998-Jan. 2000

Ezenial, Inc., Jan. 1999-Aug. 2000

Thomson Consumer Electronics (expert witness), Nov. 2000-Feb. 2002; 2007-2008.

Intel, Jan. 2001-April 2001

Bain and Co., Jan. 2001-April 2001

DirecTV, Inc. (expert witness), 2002-2009

DRTV Systems Ltd., April 2002

Pause Technology (expert witness), 2003

Polycom (expert witness), 2003

Forney Corporation (expert witness), 2003-2005

IPIX Corp. (expert witness), 2005  
Motorola, Inc. (expert witness), 2006-2008, 2011-present  
Scientific Atlanta (expert witness), 2006-2008  
Technical Advisor, One Laptop Per Child, 2006-present  
Technical Advisor, TDVision Systems, 2006-present  
Eastman Kodak (expert witness), February 2007-January 2008  
EchoStar (expert witness), 2007-2008  
Funai (expert witness), 2007-2010  
Kyocera Sanyo Telecom and Palm, Inc. (expert witness) 2009-2010  
Thomson Licensing, 2010  
Research in Motion, Ltd. (expert witness), 2011-present  
Twentieth Century Fox Home Entertainment (expert witness), 2011-2012  
HTC, (expert witness), 2011-present

*Department and Institute Committees, Other Assigned Duties*  
School of Architecture and Planning Committee on Academic Computing Needs,  
1989-1990  
Freshman advisor and seminar leader, 1990-present  
*The Tech* advisory board, 1991-present  
Independent Activities Period Policy Committee, 1991-1994, 1995-1997  
Media Arts & Sciences Program IAP Coordinator, 1992-present  
Media Arts & Sciences Departmental Committee on Graduate Students, 1994-  
1997, 2005-2006 (acting head, spring semester 1996)  
Committee on the Undergraduate Program Subcommittee on Freshman Advis-  
ing, 1998-1999  
Media Arts & Sciences Undergraduate Officer, 1996-present  
Founder and Director, Media Arts & Sciences Freshman Program, 1999-present

*Government and Other Committees, Service, etc.*  
Committee on Open High-Resolution Systems, 1990-1991  
Federal Communications Commission Advisory Committee on Advanced Tele-  
vision Service, Planning Subcommittee Working Party 4, 1992  
Local Arrangements Chair, IEEE International Conference on Multimedia Com-  
puting and Systems, 1994  
Conference Co-Chair, SPIE Conference on Integration Issues in Large Commer-  
cial Media Delivery Systems, 1995, 1996  
Board of Editors, SMPTE Journal, 1995-present

Conference Co-Chair, SPIE Conference on Reconfigurable Technology for Rapid Product Development and Computing, 1996  
General Chair, ACM Multimedia Conference, 1996  
Organizer, Objects of Communication Symposium, 1996  
Conference Co-Chair, SPIE Conference on Multimedia Networks and Applications, 1997, 1998, 1999, 2000  
Conference Co-Chair, SPIE Conference on Media Processors, 1999, 2000, 2001, 2002, 2003, 2004, 2005  
Manuscript reviewer for six journals and three book publishers  
Associate Editor, *Optical Engineering*, 2004-present  
ARDA Exploratory Program Executive Committee member, 2004-2006  
Technical Advisory Panel, Council for Research Excellence, 2005-present  
General Chair, IEEE Consumer Communications and Networking Conference 2006  
Emmy Advanced Media Committee, National Academy of Television Arts and Sciences, 2006-present  
Board of Governors, National Academy of Media Arts and Sciences, 2007-present  
Conference co-chair, SPIE Practical Holography conference, 2011, 2012, 2013  
Conference co-chair, International Symposium on Display Holography, 2012  
Co-Chair, Optical Society of America 3D Display Technology, Perception, and Application Incubator Meeting, 2012

#### *Awards Received*

I.B.M. Communications Doctoral Fellowship, 1986 and 1987  
Sony Corporation Career Development Professorship, 1991-1995  
IEEE ASIC '93 (Conference on Application Specific Integrated Circuits) Speaker's Award, 1993  
IEEE Computer Society Certificate of Appreciation, 1994  
Alex W. Dreyfoos, Jr. Career Development Professorship, 1995-1997  
Marquis Who's Who in Science and Engineering, 1996-1997; Who's Who in the East, 1997, 1998; Who's Who in Entertainment, 1997; Who's Who in America, 2001  
ACM Recognition of Service Award, 1997  
Distinguished Alumnus Award, John Piersol McCaskey High School, Lancaster PA, 1997  
Fellow, IC<sup>2</sup> Institute, University of Texas at Austin, 2001  
Fellow, SPIE, 2002

INDEX: Design to Improve Life Award (as member of team that designed OLPC XO laptop), 2007

Effic Award (bronze) for work on Sprite Slam Dunk Competition, 2013

### *Current Organization Membership*

American Institute of Physics

Association for Computing Machinery (ACM)

Institute of Electrical and Electronic Engineers (IEEE)

Optical Society of America (OSA)

Society of Photo-Instrumentation Engineers (SPIE) (Fellow, 2002-present; Associate Editor, *Optical Engineering*, 2004-2011)

Society of Motion Picture and Television Engineers (SMPTE) (Manager, New England Section, 1993-1995; Board of Editors, 1995-present)

### *Patents*

1. U.S. Patent 4,673,981, "Unrecordable Video Signals," (co-inventors Andrew Lippman and Jerome Wiesner)
2. U.S. Patent 5,185,852, "Antialiasing Apparatus and Method for Computer Printers," (co-inventor Christopher Mayer)
3. U.S. Patent 5,946,425, "Method and Apparatus for Automatic Alignment of Volumetric Images Containing Common Subject Matter," (co-inventor Tamas Sandor)
4. U.S. Patent 6,022,648, "Bistable, Thermochromic Recording Materials for Rendering Color and Gray Scale," (co-inventor Joseph Jacobson).
5. U.S. Patent 6,642,940, "Management of Properties for Hyperlinked Video," (co-inventors Edmond Chalom, Jonathan Dakss, and Nuno Vasconcelos).
6. U.S. Patent 6,816,628, "Methods for Outlining and Filling Regions in Multi-Dimensional Arrays," (co-inventors Karen Sarachik, Jonathan Dakss, and Joshua Wachman).
7. U.S. Patent 6,879,720, "Methods for Outlining and Filling Regions in Multi-Dimensional Arrays," (co-inventors Karen Sarachik, Jonathan Dakss, and Joshua Wachman).
8. U.S. Patent 6,944,228, "Method and Apparatus for Encoding Video Hyperlinks," (co-inventors Jonathan Dakss and Daniel Katcher).
9. U.S. Patent 6,978,053, "Single-Pass Multilevel Methods for Applying Morphological Operators in Multiple Dimensions," (2 co-inventors).
10. U.S. Patent 7,117,517, "Method and Apparatus for Generating Data Structures for a Hyperlinked Television Broadcast," (4 co-inventors).
11. U.S. Patent 7,120,924, "Method and Apparatus for Receiving a Hyperlinked

- Television Broadcast," (5 co-inventors).
12. U.S. Patent 7,249,367, "Method and Apparatus for Switching Between Multiple Programs by Interacting with a Hyperlinked Television Broadcast," (3 co-inventors).
  13. U.S. Patent 7,367,042, "Method and Apparatus for Hyperlinking in a Television Broadcast," (6 co-inventors).
  14. U.S. Patent 7,636,365, "Smart Digital Modules and Smart Digital Wall Surfaces Combining the Same," (3 co-inventors).
  15. U.S. Patent 8,010,986, "Synchronization and Automation in an ITV Environment," (4 co-inventors).
  16. U.S. Patent 8,149,265, "Holographic Video Display System," (3 co-inventors).
  17. U.S. Patent 8,356,329, "Method and Apparatus for Interaction with Hyperlinks in a Television Broadcast," (8 co-inventors).
  18. U.S. Patent applied for 2001, "Program Stream Switching in a Hyperlinked Video Broadcast," (2 co-inventors).
  19. U.S. Patent applied for 2007, "Self-Refreshing Display Controller for a Display Device in a Computational Unit," (3 co-inventors).
  20. U.S. Patent applied for 2009, "Tangible Social Network," (1 co-inventor).
  21. U.S. Patent applied for 2010, "Methods and Apparatus for Holographic Animation," (2 co-inventors).
  22. U.S. Patent applied for 2012, "Methods and Apparatus for Accessing Peripheral Content," (2 co-inventors).
  23. U.S. Patent applied for 2013, "Force-Sensing Net," (3 co-inventors).
  24. U.S. Patent applied for 2013, "Context-Aware Omnidirectional Projector," (4 co-inventors).



*Teaching Experience of V. Michael Bove, Jr.*

FT89, 4.994, Media Arts and Sciences Doctoral Proseminar, taught unit on signals and systems (3 weeks), 10 students  
ST90, 4.998, Digital Image Processing for Hard Copy, 12 students  
FT90, 4.890, Signals and Systems for Media Technology, one of four instructors, 12 students  
FT90, 4A05 (freshman advising seminar), Case Studies in Visual Communications, 9 students  
ST91, 4.964, Digital Image Processing for Hard Copy, 6 students  
FT91, 4.890, Signals and Systems for Media Technology, one of four instructors, 12 students  
FT91, 4A05 (freshman advising seminar), Case Studies in Visual Communications, 9 students  
ST92, 4.964, Digital Image Processing for Hard Copy, 9 students  
FT92, 4.890, Signals and Systems for Media Technology, one of two instructors, 13 students  
FT92, 4A05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
IAP93, "Ernie Kovacs"  
ST93, 4.964, Digital Image Processing for Hard Copy, 8 students  
FT93, MAS101/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 20 students  
FT93, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
IAP94, "A Look Back at Colorization"  
ST94, MAS814, Digital Image Processing for Hard Copy, 8 students  
FT94, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
FT94, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 16 students  
IAP95, "Dimensional Transcendence," one of three instructors  
ST95, MAS814, Digital Image Processing for Hard Copy, 5 students  
FT95, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 7 students  
FT95, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 15 students  
ST96, MAS961, On Being Meta, one of three instructors, 14 students  
FT96, MASA05 (freshman advising seminar), Case Studies in Visual Commu-

nications, 8 students  
 FT96, MAS160/MAS510, Signals, Systems, and Information for Media Technology, sole instructor, 19 students  
 ST97, MAS814, Digital Image Processing for Hard Copy, 7 students  
 ST97, MAS961, On Being Meta, one of three instructors  
 FT97, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
 FT97, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 10 students  
 ST98, MAS816, On Being Meta, one of three instructors  
 FT98, MASA05 (freshman advising seminar), Case Studies in Visual Communications, 8 students  
 ST99, MAS814, Digital Image Processing for Hard Copy, 12 students  
 ST99, MAS111, Introduction to Doing Research in Media Arts and Sciences, 12 students  
 FT99, MASA09 (freshman advising seminar), Television, Inside and Out, 8 students  
 ST00, MAS111, Introduction to Doing Research in Media Arts and Sciences, 15 students  
 ST00, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 24 students  
 FT00, MASA09 (freshman advising seminar), Television, Inside and Out, 8 students  
 ST01, MAS111, Introduction to Doing Research in Media Arts and Sciences, 25 students  
 ST01, MAS814, Digital Hard Copy, 6 students  
 FT01, MASA09 (freshman advising seminar), Television, Inside and Out, 9 students  
 FT01, MAS160/MAS510, Signals, Systems, and Information for Media Technology, one of two instructors, 14 students  
 ST02, MAS111, Introduction to Doing Research in Media Arts and Sciences, 25 students  
 ST02, MAS890, Workshop in Community-Maintainable Online Collaborative Spaces, 20 students  
 FT02, MASA09 (freshman advising seminar), Television, Inside and Out, 9 students  
 ST03, MAS111, Introduction to Doing Research in Media Arts and Sciences, 15 students  
 FT03, MASA18 (freshman advising seminar), Engineering: the Good, the Bad,

and the Ugly, 10 students

FT03, MAS160/MAS510/MAS511, Signals, Systems, and Information for Media Technology, one of two instructors, 24 students

ST04, MAS111, Introduction to Doing Research in Media Arts and Sciences, 15 students

FT04, MASA18 (freshman advising seminar), Engineering: the Good, the Bad, and the Ugly, 7 students

ST05, MAS111, Introduction to Doing Research in Media Arts and Sciences, 15 students

FT05, MAS160/MAS510/MAS511, Signals, Systems, and Information for Media Technology, 14 students

ST06, MAS111, Introduction to Doing Research in Media Arts and Sciences, 10 students

FT06, MASA18 (freshman advising seminar), Engineering: the Good, the Bad, and the Ugly, 11 students

ST07, MAS111, Introduction to Doing Research in Media Arts and Sciences, 10 students

FT07, MASA18 (freshman advising seminar), Engineering: the Good, the Bad, and the Ugly, 10 students

FT07, MAS160/MAS510/MAS511, Signals, Systems, and Information for Media Technology, 12 students

FT07, MAS110, Fundamentals of Computational Media Design, 25 students

ST08, MAS111, Introduction to Doing Research in Media Arts and Sciences, 18 students

FT08, MAS110, Fundamentals of Computational Media Design, 25 students

ST09, MAS111, Introduction to Doing Research in Media Arts and Sciences, 9 students

ST09, MAS963, New Media Storytelling, 10 students

FT09, MAS110, Fundamentals of Computational Media Design, 25 students

FT09, MASA19 (freshman advising seminar), Designing Consumer Electronics, 9 students

ST10, MAS111, Introduction to Doing Research in Media Arts and Sciences, 21 students

ST10, MAS963, New Media Storytelling, 9 students

FT10, MAS110, Fundamentals of Computational Media Design, 28 students

FT10, MASA19 (freshman advising seminar), Designing Consumer Electronics, 10 students

ST11, MAS111, Introduction to Doing Research in Media Arts and Sciences, 12

students

FT11, MAS110, Fundamentals of Computational Media Design, 30 students

FT11, MASA19 (freshman advising seminar), Designing Consumer Electronics,  
10 students

ST12, MAS111, Introduction to Doing Research in Media Arts and Sciences, 20  
students

ST12, MAS160/MAS510/MAS511, Signals, Systems, and Information for Me-  
dia Technology, 6 students

FT12, MAS110, Fundamentals of Computational Media Design, 30 students

FT12, MASA19 (freshman advising seminar), Designing Consumer Electronics,  
10 students

ST13, MAS111, Introduction to Doing Research in Media Arts and Sciences, 20  
students

## Publications of V. Michael Bove, Jr.

### Books

(for book chapters see Other Major Publications)

1. S. A. Benton and V. M. Bove, Jr., *Holographic Imaging*, Wiley, 2008.

### Papers in Refereed Journals

1. V. M. Bove, Jr., "A Probabilistic Method for Integrating Multiple Sources of Range Data," *Journal of the Optical Society of America A*, 7, Dec. 1990, pp. 2193-2198.
2. V. M. Bove, Jr. and A. B. Lippman, "Scalable Open Architecture Television," *SMPTE (Society of Motion Picture and Television Engineers) Journal*, 101, Jan. 1992, pp. 2-5.
- <sup>o</sup> 3. A. Singh and V. M. Bove, Jr., "Multidimensional Quantizers for Scalable Video Compression," *IEEE Journal on Selected Areas in Communications*, 11, Jan. 1993, pp. 36-45.
4. V. M. Bove, Jr., "Entropy-Based Depth from Focus," *Journal of the Optical Society of America A*, 10, Apr. 1993, pp. 561-566.
- <sup>o</sup> 5. K. Tsunashima, J. B. Stampleman, and V. M. Bove, Jr., "A Scalable Motion-Compensated Subband Image Coder," *IEEE Transactions on Communications*, 42, Apr. 1994, pp. 1894-1901.
6. V. M. Bove, Jr. and J. A. Watlington, "Chcops: A Reconfigurable Data-Flow System for Video Processing," *IEEE Transactions on Circuits and Systems for Video Technology*, 5, Apr. 1995, pp. 140-149.
7. V. M. Bove, Jr., "Object-Oriented Television," *SMPTE Journal*, 104, Dec. 1995, pp. 803-807.
8. V. M. Bove, Jr., "Multimedia Based on Object Models: Some Whys and Hows," *IBM Systems Journal*, 35, 1996, pp. 337-348.
9. V. M. Bove, Jr., "Beyond Images," *Convergence: The Journal of Research into New Media Technologies*, 2, Autumn 1996, pp. 30-46.
- <sup>o</sup> 10. J. A. Watlington and V. M. Bove, Jr., "Stream-Based Computing and Future Television," *SMPTE Journal*, 106, April 1997, pp. 217-224.
- <sup>o</sup> 11. J. A. Watlington and V. M. Bove, Jr., "A System for Parallel Media Processing," *Parallel Computing*, 23:12 December 1997, pp. 1793-1809.
- <sup>o</sup> 12. S. Agamanolis and V. M. Bove, Jr., "Multilevel Scripting for Responsive Multimedia," *IEEE Multimedia*, 4:4 October-December 1997, pp. 40-50.
- <sup>o</sup> 13. V. M. Bove, Jr., J. Dakss, S. Agamanolis, E. Chalom, "Adding Hyperlinks to Digital Television," *SMPTE Journal*, 108, November 1999, pp. 795-801.
14. V. M. Bove, Jr. and W. Butera, "The Coding Ecology: Image Coding Via

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<sup>o</sup>Outgrowths of supervised theses or research projects.

Competition among Experts," *IEEE Transactions on Circuits and Systems for Video Technology*, 10, October 2000, pp. 1049-1058.

<sup>o</sup> 15. V. M. Bove, Jr., J. Dakss, E. Chalom, and S. Agamanolis, "Hyperlinked Television Research at the MIT Media Laboratory," *IBM Systems Journal*, 39, 2000, pp. 470-478.

<sup>o</sup> 16. S. Agamanolis and V. M. Bove, Jr., "Viper: a Framework for Responsive Television," *IEEE Multimedia*, 10:3, July-Sept. 2003, pp. 88-98.

<sup>o</sup> 17. V. M. Bove, Jr. and Wilfrido Sierra, "Personal Projection," *SMPTE Motion Imaging Journal*, 113, Jan. 2004, pp. 17-21.

<sup>o</sup> 18. V. M. Bove, Jr. and J. Mallett, "Collaborative Knowledge Building by Smart Sensors," *BT Technology Journal*, 22:4, Oct. 2004, pp. 45-51.

<sup>o</sup> 19. D. Butler, V. M. Bove, Jr., and S. Sridharan, "Real-Time Adaptive Foreground/Background Segmentation," *EURASIP Journal on Applied Signal Processing*, 14:11, Aug. 2005, 2292-2304.

<sup>o</sup> 20. W. Plesniak, M. Halle, V. M. Bove, Jr., J. Barabas, and R. Pappu, "Reconfigurable Image Projection (RIP) Holograms," *Optical Engineering*, 45:11, Nov. 2006.

21. V. M. Bove, Jr., "Holographic Television: What and When?" *SMPTE Motion Imaging Journal*, 120:4, May/June 2011, pp. 36-40.

22. V. M. Bove, Jr., "Engineering for Live Holographic TV" *SMPTE Motion Imaging Journal*, 120:8, November/December 2011, pp. 56-60.

23. V. M. Bove, Jr., "Display Holography's Digital Second Act," *Proceedings of the IEEE*, 100:4, April 2012, pp. 918-928.

<sup>o</sup> 24. S. Jolly, D. E. Smalley, J. Barabas, and V. M. Bove, Jr., "Direct Fringe Writing Architecture for Photorefractive Polymer-Based Holographic Displays: Analysis and Implementation," *Opt. Eng.* 52:5, 055801, 2013, doi: 10.1117/1.OE.52.5.055801

<sup>o</sup> 25. D. E. Smalley, Q. Y. J. Smithwick, V. M. Bove, J. Barabas and S. Jolly, Anisotropic leaky-mode modulator for holographic video displays, *Nature*, 498, 20 June 2013, pp. 313 - 317.

#### *Papers in Refereed Conference Journals*

1. V. M. Bove, Jr., "Pictorial Applications for Range Sensing Cameras," in *SPIE Vol. 901: Image Processing, Analysis, Measurement, and Quality*, Society of Photo-Optical Instrumentation Engineers, Bellingham WA, 1988, pp. 10-17.

2. B. Girod, V. M. Bove, Jr., A. B. Lippman, "Automatic 3-D Scene Modeling from Range and Motion," *Proc. Second International Workshop on 64kbit/s Coding of Moving Video*, Hannover Germany, 1989.

3. V. M. Bove, Jr., "Discrete Fourier Transform Based Depth-from-Focus," *OSA Technical Digest Series Vol. 14: Image Understanding and Machine Vision*, Optical Society of America, Washington DC, 1989, pp. 118-121.

4. V. M. Bove, Jr. and A. B. Lippman, "Open Architecture Television Receivers and Extensible/Intercompatible Digital Video Representations," *Proc. IEEE ISCAS (International Symposium on Circuits and Systems)*, New Orleans LA, 1990, pp. 1294-1297.
5. V. M. Bove, Jr., "Scalable, Spatiotemporal Resolution-Independent Digital Image Format," *Proc. Picture Coding Symposium*, Cambridge MA, 1990, pp. 4.6.1-4.6.4.
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- <sup>o</sup> 16. J. A. Watlington, M. Lucente, C. J. Sparrell, V. M. Bove, Jr., and I. Tamitani, "A Hardware Architecture for Rapid Generation of Electro-Holographic Fringe Patterns," *Proc. SPIE Practical Holography IX, 2406*, 1995, pp. 172-183.

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23. V. M. Bove, Jr., "Algorithms and Systems for Modeling Moving Scenes," *Proc. EUSIPCO-96 (European Signal Processing Conference)*, Trieste, 1996, pp. 1685-1688.
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<sup>051</sup>. B. C. Dalton and V. M. Bove, Jr., "Audio-Based Self-Localization for Ubiquitous Sensor Networks," *Proc. 118th Audio Engineering Society Convention*, 2005.

<sup>052</sup>. D. E. Smalley, Q. Y. J. Smithwick, and V. M. Bove, Jr., "Holographic Video Display Based on Guided-Wave Acousto-Optical Devices," *Proc. SPIE Practical Holography XXI*, 6488, 2007.

<sup>053</sup>. V. M. Bove, Jr., D. E. Smalley, and Q. Y. J. Smithwick, "Making Holographic Television a Consumer Product," (invited paper) *Proc. OSA Topical Meeting on Digital Holography and Three-Dimensional Imaging*, 2007.

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<sup>055</sup>. B. T. Taylor and V. M. Bove, Jr., "The Bar of Soap: A Grasp Recognition System Implemented in a Multi-Functional Handheld Device," *Proc. ACM CHI*, 2008.

<sup>056</sup>. J. J. Kalanithi and V. M. Bove, Jr., "Connectibles: Tangible Social Networks," *Proc. 2nd Intl. Conf. on Tangible and Embedded Interaction (TEI'08)*, 2008.

<sup>056</sup>. Q. Y. J. Smithwick, J. Barabas, D. E. Smalley, and V. M. Bove, Jr., "Real-Time Shader Rendering of Holographic Stereograms," *Proc. SPIE Practical Holography XXIII*, 7233, 2009.

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<sup>058</sup>. V. M. Bove, Jr., Q. Y. J. Smithwick, J. Barabas, and D. E. Smalley, "Is 3-D TV Preparing the way for Holographic TV?" *Proc. 8th International Symposium on Display Holography*, 2009.

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<sup>61</sup>. V. M. Bove, Jr., "What is Holographic Television, and Will it Ever be in My Living Room?" *Proc. 2010 SMPTE International Conference on Stereoscopic*

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<sup>0</sup>62. J. Barabas, S. Jolly, D. E. Smalley, and V. M. Bove, Jr., "Diffraction Specific Coherent Panoramagrams of Real Scenes," *Proc. SPIE Practical Holography XXV*, 7957, 2011.

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<sup>0</sup>65. D. Cranor, A. Peyton, A. Persaud, R. Bhatia, S. Kim, and V. M. Bove, Jr., "ShakeOnIt: An Exploration Into Leveraging Social Rituals for Information Access," *Proc. TEI '11*, 2011.

<sup>0</sup>66. J. Barabas, S. Jolly, D. E. Smalley, and V. M. Bove, Jr., "Depth Perception and User Interface in Digital Holographic Television," *Proc. SPIE Practical Holography XXVI*, 8281, 2012.

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<sup>0</sup>68. D. Smalley, Q. Smithwick, J. Barabas, V. M. Bove, Jr., S. Jolly, and C. Della Silva, "Holovideo for Everyone: a Low-Cost Holovideo Monitor," *J. Phys.: Conf. Ser.* 415, 012055, 2013.

<sup>0</sup>69. J. Barabas and V. M. Bove, Jr., "Visual Perception and Holographic Displays," *J. Phys.: Conf. Ser.* 415, 012056, 2013.

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#### *Other Major Publications*

1. W. Bender, V. M. Bove, Jr., A. Lippman, L. Liu, J. Watlington, "High Definition Systems in the 1990s: Open Architecture and Computational Video," *HDTV World Review*, 1:3, Summer 1990, pp. 11-15.

2. V. M. Bove, Jr., "Advanced TV should be Open Architecture" (opinion column), *TV Technology*, August 1992, p. 7.

3. A. Lippman and V. M. Bove, Jr., "ATV Profile: Contribution to the Requirements Discussion," ISO/IEC JTC1/SC29/WG11 MPEG92/759, 1992.

4. V. M. Bove, Jr., "Scalable (Extensible, Interoperable) Digital Video Representations" (book chapter), A. B. Watson, ed., *Digital Images and Human*

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5. V. M. Bove, Jr., "What's Wrong with Today's Video Coding?" (opinion column), *TV Technology*, February 1995, p. 7.
6. V. M. Bove, Jr. and A. B. Lippman, "Television," *World Book Encyclopedia*, Vol. 19, World Book, Chicago IL, 1995, pp. 124-128.
7. N. Negroponte and V. M. Bove, Jr., "Object Oriented Television," *Wired*, July 1996, p. 188.
8. V. M. Bove, Jr., *et al.*, Comment on FCC 96-207, Fifth Further Notice of Proposed Rule Making in the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, 1996.
9. V. M. Bove, Jr., N. Miyaho, and D. A. Harris, introductory chapter, *Multimedia Communication Networks: Technologies and Services*, M. Tatipamula and B. Khasnabish, eds., Artech House, Norwood MA, 1997.
10. V. M. Bove, Jr., "Online to the Future" (opinion column), *The Sunday Times* (London), October 4, 1998.
11. V. M. Bove, Jr., "Communication," *The New Book of Knowledge*, Grolier, Bethel CT, 2000, pp. 462-471.
12. V. M. Bove, Jr., "Astronauts and Mosquitos" (opinion column), *Communications of the ACM*, March 2001, p. 48.
13. V. M. Bove, Jr., "Connected by Media" (opinion column), *IEEE Multimedia*, Oct. 2001.

#### *Invited Lectures and Seminars*

1. "Model Building Cameras," National Computer Graphics Association, Philadelphia PA, April 18, 1989.
2. "Extensible/Intercompatible Digital Video Representations," EIA Digital Advanced Television Workshop, Washington DC, November 7, 1989.
3. "Television of Tomorrow," ILP Symposium on Telecommunications Technology and Policy for the 21st Century, M.I.T., April 24, 1990.
4. "Open Architecture Television," Symposium on the Media Laboratory 5th Anniversary, M.I.T., October 2, 1990.
5. "Open Architecture Television," EIA/IEEE Second International Workshop on Digital Video Communications, Cambridge MA, November 26, 1990.
6. "Scalable Video Representations for Visual Information Services," National Engineering Consortium Information Networking ComForum, Orlando FL, December 14, 1990.
7. "Scalable (Extensible, Interoperable) Video Coding," National Research Council Visual Factors in Electronic Image Communications Conference, Woods Hole MA, July 22, 1991.
8. "Scalability and Open Architecture," Digital Television Symposium, M.I.T.,

May 21, 1992.

9. "A Future Model for HDTV," Production '93, Montreal, May 26, 1993.
10. "Hardware and Software Implications of Representing Scenes as Data," (banquet address) IEEE Conference on Application Specific Integrated Circuits '93, Rochester NY, September 29, 1993.
11. "Some Thoughts on Image Representations, Scene Representations, and Hardware/Software Architectures," IEEE International Conference on Computer Design '93, Cambridge MA, October 4, 1993.
12. "Image and Scene Representations and System Architectures," EIA Digital Advanced Television Workshop, Cambridge MA, October 14, 1993.
13. "Machines Behind the Scenes: Computation and Structured Video," Perspectives Lecture Series, M.I.T., April 26, 1994.
14. "Object-Oriented Television," Joint New England SIGGRAPH/New England SMPTE Meeting, Cambridge MA, October 27, 1994.
15. "Object-Oriented Television," Symposium on The Digital Revolution and its Effect on Japanese Industry (sponsored by Kodansha Publishing), Tokyo, March 15, 1995.
16. "Multimedia Computing: Parallelism without Pain," IEEE Workshop on Multimedia Processors (part of ICMCS '95), Washington DC, May 19, 1995.
17. "Stream-Based Computing and Future Television," EIA/IEEE-CES Digital Television Workshop, Philadelphia, October 5, 1995.
18. "Eyes, Cameras, Objects," Symposium on the Media Laboratory 10th Anniversary, M.I.T., October 10, 1995.
19. "Future Television: Why We Need All Those MIPS and Where We're Going to Get Them," Princeton University Dept. of Electrical Engineering, October 24, 1995.
20. "The Likely Convergence of Multimedia, Video, Communications, and Computing" (panel discussion), Photonics East '95, Philadelphia, October 24, 1995.
21. "Trends to Watch For in Consumer (and Professional) Multimedia," ComExpo, Houston TX, January 11, 1996.
22. "Multimedia Trends," Texas Instruments National Sales Meeting, Dallas TX, April 23, 1996.
23. "Object-Based Multimedia," Objects of Communication Symposium, M.I.T., May 22, 1996.
24. "Object-Based Media and Why It's a Good Problem," Bell Laboratories, Murray Hill NJ, August 28, 1996.
25. "The Future of Electronic Visual Communications," Medientage München, Munich, October 17, 1996.
26. "Hardware and Software Impacts of New Media Representations," ACM Workshop on Media Processors (part of ACM MM'96), Boston, November 19,

- 1996.
27. "Convergence in the 21st Century" (panel discussion), SPIE International Symposium on Voice, Video and Data Communications, Boston, November 20, 1996.
  28. "Object-Based Media," Hewlett-Packard Laboratories, Palo Alto CA, February 11, 1997.
  29. "Stream-Based Media Computing: What, How, and Why," University of California at Berkeley Dept. of EECS, January 30, 1998.
  30. "Responsive Object-Based Media," Greater Boston ACM, February 19, 1998.
  31. "Stream-Based Media Processing," American Physical Society Symposium on the Physics of Imaging, Rochester NY, April 24, 1998.
  32. "The Future of Media is Object-Based," Southeastern Mass. MIT Alumni Club, New Bedford MA, May 20, 1998.
  33. "Object-Based Media and Stream-Based Computing," First International Workshop on Advanced Graphics and Multimedia Systems, Naples Italy, November 17, 1998.
  34. "The Object-Based Media Group," Mitsubishi Electric Research Laboratory, Cambridge MA, December 11, 1998.
  35. "The Object-Based Media Group," Stanford University Computer Science Dept., January 29, 1999.
  36. "Hyperlinked Television as an E-Commerce Portal," Vanguard Technology Transfer Institute, Cambridge MA, May 17, 1999.
  37. "Video and the Internet: TV or not TV?" American Museum of the Moving Image, New York, December 8, 1999.
  38. "Will Anyone Really Need a Web Browser in Five Years?" Canadian Institute for Telecommunication Research annual meeting, Ottawa, August 28, 2000.
  39. "Imaging at the MIT Media Lab" (plenary speaker), IS&T PICS 2001, Montreal, April 23, 2001.
  40. "The Future" (panel discussion), ITV Content E-mergency, Columbia University, New York, July 17, 2001.
  41. "Responsive Media: The Intersection between Broadcast and Personalization," The Interactive TV Show USA, New York, August 16, 2001.
  42. "Development of Technology from Unlikely Sources," Canadian Undergraduate Technology Conference, Toronto, January 17, 2002.
  43. "Sharing and Playing Well with Others: Everything We Need to Know about the Future, We Learned in Kindergarten," (keynote) IDC Imaging Convergence Forum, New York, August 7, 2002.
  44. "Really Smart Cameras and Sugar-Cube-Sized Video Projectors," MIT

- Family Weekend, Cambridge MA, October 18, 2003.
45. "Computational Ecosystems," Ubi-Comp Symposium on Ubiquitous Computing, Seoul, December 10, 2003.
  46. "Really Smart Cameras and Sugar-Cube-Sized Video Projectors," MIT Alumni Club of RI, Warwick RI, April 13, 2004.
  47. "The Consumer Electronics Laboratory at the MIT Media Laboratory," GSPx, Santa Clara CA, September 29, 2004.
  48. "Really Smart Cameras and Sugar-Cube-Sized Video Projectors," MIT Alumni Club of Cape Cod, Hyannis MA, November 17, 2004.
  49. "Consumer Electronics Research at the MIT Media Lab," Harvard Business School Entrepreneurship Conference, March 3, 2005.
  50. "Changing Dynamic in Consumer Electronics," 2005 Perspective Forum, Berkeley CA, March 9, 2005.
  51. "View from the Consumer Electronics Laboratory," 2005 North American Broadcasters Association General Meeting, Toronto, May 18, 2005.
  52. "Musings – and a Few Facts – about 3-D TV," MIT CIPS Workshop on Advanced Television, Cambridge, January 21, 2009.
  53. "Holographic Video and 3-D Television," "Photons, Neurons and Bits: Holography for the 21st Century," Cambridge MA, March 7, 2009.
  54. "From 3-D TV to Holographic TV," Microsoft Hardware Day, Redmond WA, August 5, 2009.
  55. "Debunking Hollywood's Holograms," MIT Museum, Cambridge MA, December 11, 2009.
  56. "Moving Holographic TV from the Lab to Your Living Room," New England Section, Optical Society of America, Cambridge MA, 20 October 2010.
  57. "Hollywood's Holograms (and MIT's)" and "Pattern Recognition is Everywhere." (2 lectures), Connecticut Science Education Conference, Hamden CT, 30 October 2010.
  58. "A Look Back – and Forward – at Holographic TV," New England SID and SMPTE joint meeting, Needham MA, 18 January 2012.
  59. "Holographic Video and How it Might Become Part of the 3D Ecosystem," Third Workshop on 3D Cinematography (part of CVPR 2012), Providence RI, 16 June 2012.
  60. "A Look Back – and Forward – at Holographic TV," IEEE Photonics Laser Workshop, Lexington MA, 7 November 2012.

### *Research Funding*

Television of Tomorrow Consortium, 1989-1996  
 Digital Life Consortium, 1997-present  
 Intel Digital Expression Project, 2000-2002

*Although one of several researchers on the above two contracts, I accounted for a major portion of the research volume. On Television of Tomorrow, for example, I typically supported six research assistants and five UROP students as well as a \$150,000 fabricated equipment budget annually. I was responsible for approximately a third of the \$2M annual research volume.*

Movies of the Future Consortium, 1989-1994, (supported one research assistant annually)

DARPA Contract DAAD 05-90-C-0333, "Scalable Video," 1990-1993, (supported one research assistant annually)

Bell Northern Research, "Video Coding Testbed," \$30,000 annually, 1991-1993  
NASA SRC-B093-93-043, "High Speed Research," (subcontractor to Honeywell Technology Center), project approved to begin in 1995 but funds were never released by NASA

Broadercasting Special Interest Group, Principal Investigator, 1999-2002

NASA Hierarchical Learning Networks, Principal Investigator, \$250,000 annually, 2002-2005

"Smart Architectural Surfaces," ICU/Korean Ministry of Information and Communications, 2003-2004

CELab (consumer electronics research program), Principal Investigator, 2004-present

Center for Future Storytelling, co-director, 2008-present

Office of the Director of National Intelligence (ODNI), Intelligence Advanced Research Projects Activity (IARPA), through the AFRL contract FA8650-10-C-7034, 2010-2012

### *Theses Supervised by V. Michael Bove, Jr.*

#### *SB Theses*

Chun, Jang H., *Decoding Data in the NTSC Chrominance Channel*, EECS SB, June 1990.

Davis, Desmond O., *Encoding Digital Data in the NTSC Chrominance Channel*, EECS SB, June 1990.

Lee, David S., *Compression of Images Using Zero Crossings of Bandpass Signals*, EECS SB, June 1990.

Blount, Alan W., *Display Manager for a Video Processing System*, EECS SB, June 1991.

Mitchell, Michael D., *X Windows for an Intelligent Display*, EECS SB, June 1991.

Tewari, Rajeev, *The Cheops Input Module: A Real Time Digitizing and Filtering Engine*, EECS SB, June 1991.



Chackerian, Mark, *A Motion-Estimating Board for the Cheops Imaging System*, EECS SB, May 1992.

Kwon, Chris C., *A Stream Processor for Vector Quantized Images*, EECS SB, May 1992.

Lawai, Adnan H., *Scalable Subband Coding for Continuously Variable Raster Sizes*, EECS SB, May 1992.

Nanayakkara, Prasath S. W., *Communication Protocol for a Digital Video Processor*, EECS SB, May 1992.

Evanco, Kathleen L., *A Compiler for an Object-Oriented Parallel Stream Processing Language*, EECS SB, May 1993.

O, Cholwon, *Motion Compensation Decoder for Cheops Imaging System*, EECS SB, May 1993.

Yu, Jung, *Real-Time Image Morphing, Motion Compensation, and Hidden Surface Removal*, EECS SB, May 1994.

Hsieh, P. Angela, *Solutions for Bus Bandwidth Limitations in a Network Printing Environment*, EECS SB, May 1994.

Sung, Julie, *Image Segmentation using Multi-Dimensional Attributes*, Physics SB, May 1997.

#### SM Theses

Liu, Lin L., *Digital Intermediate Format for Video Frame Rate Conversion*, EECS SM, September 1990.

Mayer, Christopher M., *Antialiasing Methods for Laser Printers*, EECS SM, June 1991.

Woo, Peter H., *An Accumulating Frame Buffer Architecture for a High-Performance Graphics Engine*, EECS SM, June 1991.

Firestone, Scott S., *VideoChannel: A Real Time Window Processor*, EECS SM, February 1992.

Eldridge, Creighton L., *A Smart Memory for Processing Images*, EECS SM, May 1992.

Shen, Irene J., *Real-Time Resource Management for Cheops: A Configurable, Multi-Tasking Image Processing System*, EECS SM, September 1992.

Hewlett, Gregory J., *Scalable Video in a Multiprocessing Environment*, MAS SM, February 1993.

Lawai, Adnan H., *Scalable Coding of HDTV Pictures Using the MPEG Coder*, EECS SM, May 1994.

Granger, Brett D., *Real-Time Structured Video Decoding and Display*, MAS SM, February 1995.

Acosta, Edward K., *A Programmable Processor for the Cheops Image Processing System*, EECS SM, June 1995.

- Chang, Christopher I., *Handwriting Recognition on a Programmable Digital Signal Processor*, EECS SM, June 1995.
- Chang, Tzu-Yun, *Real-Time Decoding and Display of Layered Structured Video*, EECS M. Eng., June 1995.
- Mikkelson, Chad, *An Implementation of the MPEG-2 Audio Decoding Specification*, EECS M. Eng., June 1995.
- Inguilizian, Araz V., *Building a Better "Picture": Synchronized Structured Sound*, MAS SM, September 1995.
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# **EXHIBIT 8**

Patent No. 8,050,652  
Petition For *Inter Partes* Review

**UNITED STATES PATENT AND TRADEMARK OFFICE**

**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

Yamaha Corporation of America  
Petitioner

v.

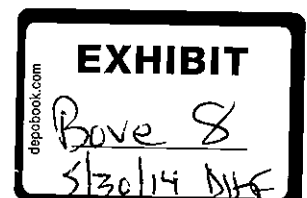
Black Hills Media, LLC  
Patent Owner

Patent No. 8,050,652  
Issue Date: November 1, 2011  
Title: METHOD AND DEVICE FOR AN  
INTERNET RADIO CAPABLE OF OBTAINING  
PLAYLIST CONTENT FROM A CONTENT SERVER

*Inter Partes* Review No. \_\_\_\_\_

**PETITION FOR *INTER PARTES* REVIEW**

**UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.100 *et seq.***



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**Exhibit List for Inter Partes Review of U.S. Patent No. 8,050,652**

<b>Exhibit Description</b>	<b>Exhibit #</b>
<i>U.S. Patent No. 8,050,652 to Qureshey et al.</i>	<i>1001</i>
<i>Declaration of Dr. V. Michael Bove, Jr.</i>	<i>1002</i>
<i>U.S. Patent Application No. 09/805,470</i>	<i>1003</i>
<i>U.S. Provisional Patent Application No. 60/072,127</i>	<i>1004</i>
<i>U.S. Patent Application No. 09/096,703</i>	<i>1005</i>
<i>U.S. Provisional Patent Application No. 60/246,842</i>	<i>1006</i>
<i>Office Action dated May 23, 2011</i>	<i>1007</i>
<i>Patent Owner ITC Claim Chart re Toshiba</i>	<i>1008</i>
<i>Office Action dated February 2, 2011</i>	<i>1009</i>
<i>U.S. Patent No. 6,587,127 to Leeke et al.</i>	<i>1010</i>
<i>PCT Publication WO 99/38266 to Qureshey et al.</i>	<i>1011</i>
<i>U.S. Patent No. 6,502,194 to Berman et al.</i>	<i>1012</i>
<i>Lansonic DAS-750 Reference Materials</i>	<i>1013</i>
<i>U.S. Patent No. 7,187,947 to White et al.</i>	<i>1014</i>

Petitioner Yamaha Corporation of America (“Petitioner”) respectfully petitions for *inter partes* review of claims 1-4, 6-8, 10, 11, 13, 14, 21, 22, 24-29, 31, 32, 34, 35, 42-45, 47-50, 52, 53, 55, and 56 of U.S. Patent No. 8,050,652 (“the ‘652 patent” (Ex. 1001)) in accordance with 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42.100 *et seq.*

**I. NOTICES AND STATEMENTS**

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner identifies Yamaha Corporation of America as the real party-in-interest.

Pursuant to 37 C.F.R. § 42.8(b)(2), Petitioner identifies the related matters in Sections III and IV.

Pursuant to 37 C.F.R. § 42.8(b)(3), Petitioner identifies the following counsel (and a power of attorney accompanies this Petition):

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Pursuant to 37 C.F.R. § 42.8(b)(4), service information for lead and back-up counsel is provided above.

Pursuant to 37 C.F.R. § 42.104(a), Petitioner certifies that the '652 patent is available for *inter partes* review and that the Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

## **II. INTRODUCTION**

The '652 patent is directed to a device and method for receiving and playing audio information, such as songs, from several different sources, including an Internet radio broadcast and an audio content source providing a playlist. The device receives information enabling it to obtain songs in the playlist from a remote source and plays the audio content indicated by the playlist.

In this Petition, Petitioner presents numerous references that anticipate or render obvious various claims. Section V of this Petition summarizes the '652 patent and its prosecution history. Section VII sets forth the detailed grounds for invalidity. This showing is accompanied by the Declaration of Dr. V. Michael Bove, Jr. ("Bove Decl.," Ex. 1002.) Accordingly, Petitioner respectfully requests a Decision to institute *inter partes* review.

## **III. CO-PENDING LITIGATIONS**

On May 22, 2012, the Patent Owner filed suit against Petitioner Yamaha Corporation of America in the U.S. District Court for the District of Delaware alleging, *inter alia*, infringement of the '652 patent and related U.S. Patent

No. 8,045,952 to Qureshey *et al.* (“the '952 patent”). See *Black Hills Media, LLC v. Yamaha Corp. of America*, No. 1:12-cv-00635-RGA (D. Del.). Plaintiff never served the original Complaint, but instead filed a September 12, 2012 First Amended Complaint that was not served until September 19, 2012. Thus, this petition has been filed within one year of Petitioner being served a complaint alleging infringement of the '652 patent. 35 U.S.C. § 315(b); 37 CFR § 42.101(b).

The Patent Owner has also filed lawsuits alleging infringement of the '652 and '952 patents against Pioneer (1:12-cv-00634), Logitech (1:12-cv-00636), Sonos (1:12-cv-00637), LG (1:13-cv-00803), Sharp (1:13-cv-00804), Toshiba (1:13-cv-00805), and Panasonic (1:13-cv-00806) in the District of Delaware, and against Samsung (2:13-cv-00379) in the Eastern District of Texas. On August 5, 2013, the Delaware Court transferred four of the cases to the Central District of California, where the Yamaha (2:13-cv-06054), Pioneer (2:13-cv-05980), Logitech (2:13-cv-06055), and Sonos (2:13-cv-06062) cases are now pending.

The Patent Owner also filed a recently instituted Section 337 action in the U.S. International Trade Commission against LG, Sharp, Toshiba, Panasonic, and Samsung alleging, *inter alia*, infringement of the '652 and '952 patents. See *Certain Digital Media Devices, Including Televisions, Blu-Ray Disc Players, Home Theater Systems, Tablets and Mobile Phones, Components Thereof and*

*Associated Software*, Inv. No. 337-TA-882 (USITC). All of the above cases are currently pending.

#### **IV. RELATED PETITION**

The '652 and '952 patents are both continuations of Application No. 09/805,470 (Ex. 1003) and share the same specification. Petitioner is concurrently filing a petition for *inter partes* review of the '952 patent.

#### **V. THE '652 PATENT**

##### **A. Background**

As noted above, the '652 patent is directed to a device and method for receiving and playing audio content from several sources, including an Internet radio broadcast and songs comprising a playlist. The device receives information enabling it to obtain the songs from a remote source, obtains the songs from the remote source, and plays the audio content indicated by the playlist. In addition to the Internet radio and playlist sources, the patent also contemplates playing songs from additional sources such as AM/FM radio broadcasts, cassettes, or CDs. Exemplary arrangements are illustrated in FIGS. 13A, 15, and 19B.

As described at 10:3-57, the device enables users to select from various modes of operation. When in the Internet radio mode of operation, the device receives and plays the Internet radio broadcast the user has selected.

As described at 28:11-30:26 with reference to FIGS. 15, 19B, and 19C, when in the playlist mode, a user at PC 1508 may log-in to server site 1104 and assign a playlist to a separate device, *e.g.*, network-enabled audio device 1510. Each network-enabled audio device (*e.g.*, device 1510 and device 1520) has storage for storing songs and associated uniform resource locators (URLs). Some of the songs identified by the playlist may already be stored on device 1510, in which case no audio data is downloaded. However, some songs may be missing.

After determining that one or more songs on the playlist are not stored on device 1510, the server site 1104 creates a list of remaining songs that need to be downloaded to device 1510. The server site determines whether the songs on the list are present on another network-enabled audio device 1520. If so, device 1510 is provided with a list of URLs of the remaining songs on device 1520. The device 1510 may then download the remaining songs from the device 1520 using the URLs provided by the server site 1104.

## **B. Prosecution History**

The '652 patent issued at the end of a chain of applications. The chain began in 1998 with provisional Application No. 60/072,127 ("the '127 provisional application," Ex. 1004) filed on January 22, 1998, and Application No. 09/096,703 ("the '703 application," Ex. 1005) filed on June 12, 1998. These applications contain disclosure relating to an internet radio device, and include FIGS. 1-10 (the

'127 provisional application includes FIG. 6 whereas the '703 application includes FIGS. 6A and 6B). However, playlists were not disclosed in either the original '127 provisional application or the '703 application.

In 2000-2001, new disclosures, including playlists, were added in provisional Application No. 60/246,842 (“the '842 provisional application,” Ex. 1006) filed on November 8, 2000 and continuation-in-part Application No. 09/805,470 (“the '470 application,” Ex. 1003) filed on March 12, 2001. Specifically, playlists were first disclosed in the '842 application, which added 29 sheets of drawings including new FIGS. 11-19, and then in the '470 application, which added 35 sheets of drawings including new FIGS. 11-21.

The application that issued as the '652 patent was filed on November 27, 2006 as Application No. 11/563,232 (“the '232 application”). The '232 application was a continuation of the '470 application and claims priority to the '470 and '703 applications, as well as the '127 and '843 provisional applications.

In a May 23, 2011 Office Action during the prosecution of the '232 application (Ex. 1007), all of the claims were provisionally rejected for double patenting. Claims 1-5, 7-9, 11-16, and 18-20 were also rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,949,492 to Mankovitz. Claims 6, 10, and 17 were objected to and indicated as containing allowable subject matter. Each of these claims included limitations regarding receiving a playlist

assigned to an electronic device from a central system, with the playlist identifying plural songs, wherein ones of the songs are not stored on the electronic device.

The Applicants amended the independent claims to add the limitations of claims 6, 10, and 17, and filed a terminal disclaimer. The application was then allowed.

## **VI. EFFECTIVE FILING DATE AND CLAIM CONSTRUCTION**

### **A. Effective Filing Date**

Each of the independent claims of the '652 patent recites, *inter alia*, a “playlist identifying a plurality of songs.” The original '127 provisional application and the '703 application were filed in 1998 with FIGS. 1-8 and 1-10, respectively. Neither the specifications nor the drawings of these applications even mention the word “playlist.” Disclosure of playlists was not included until the 2000 filing of the '842 provisional application, which added 29 new drawing sheets and accompanying description. Therefore, the earliest possible effective filing date of the '652 patent is November 8, 2000, which was the filing date of the '842 provisional application.

### **B. Claim Construction**

Petitioner notes that a claim is given the “broadest reasonable construction in light of the specification” in *inter partes* review. *See* 37 C.F.R. § 42.100(b).

Petitioner submits that the terms of the challenged claims of the '652 patent are to be given their broadest reasonable interpretation as understood by one of ordinary



skill in the art and consistent with the disclosure. The terms “playlist assigned to the electronic device” and “wherein ones of the plurality of songs are not stored on the electronic device,” which, as discussed above, were added to the independent claims by amendment, warrant additional discussion as to their broadest reasonable interpretation consistent with the specification.

**1. “Playlist Assigned to the Electronic Device”**

The term “playlist assigned to the electronic device” appears in independent claims 1, 21, and 42. The operation of assigning playlists is described in the specification in connection with FIGS. 15, 17, and 19 at 4:50-5:3, 21:40-23:5, 24:44-60, and 28:11-30:26.

The Summary of the Invention states that an aspect of the claimed invention “is a method for assigning playlists of music from one electronic device to another” and “[t]he software module allows a user to assign a playlist from a first device to a second device.” (4:50-58.) FIG. 17C illustrates the assigning operation by selecting “Make available on” and selecting a device. As stated at 24:50-53, “[t]he user can choose the menu option of ‘Make Available On’ to assign the playlist from one device to another (*e.g.*, from device 1510 to device 1520).” The entire discussion of assigning playlists is of assigning a playlist from one device to another by selecting the device to which the playlist is to be transferred. The term “playlist assigned to the electronic device” should therefore be construed as a list

of songs that is to be transferred to a particular device selected by the user. (Bove Decl. ¶¶ 12-14.)

In co-pending litigation, the Patent Owner has contended that the term “playlist assigned to the electronic device” includes a playlist that has been requested without any device selection, *i.e.*, without any act of assigning to the device. (*See, e.g.*, “Patent Owner ITC Claim Chart re Toshiba” (Ex. 1008), at 8-9.) Accordingly, although it is submitted that the Patent Owner’s construction is not correct, the claim charts in the following sections take into account both the proper construction presented by Petitioner and the incorrect, broader construction asserted by the Patent Owner.

**2. “Wherein Ones of the Plurality of Songs Are Not Stored on the Electronic Device”**

The term “wherein ones of the plurality of songs are not stored on the electronic device” appears in independent claims 1, 21, and 42 of the '652 patent. The specification describes network-enabled electronic devices 1510 and 1520, each having its own storage space to store songs. When a playlist is assigned to a device, songs not stored on the device are provided to the device and stored. (*See, e.g.*, FIG. 15; 21:40-22:15.) The plain language of the claims implies that the electronic device can store songs. Otherwise, the limitation has no meaning. *See, e.g., Lantech, Inc. v. Keip Mach. Co.*, 32 F.3d 542, 546 (Fed. Cir. 1994) (“All limitations of a claim must be considered meaningful.”); *see also* Bove Decl. ¶ 16.

In the Summary of the Invention at 3:57-4:9, it is stated that embodiments of the audio device may not have storage for songs. However, there is no disclosure of an implementation of such a device, and this would be inconsistent with the claim language. Selecting a playlist for playback is not the same operation as assigning a playlist to a device. The assigning operation is described throughout the specification as selecting a device and transferring songs to the device for storage. In this regard, during prosecution of the related '952 patent, the same Examiner evaluated the same specification and the same claim language as in the '652 patent and considered that the device had memory to store songs:

Regarding claims 1, 9, and 15, none of the prior arts of record, in combination or individual, show or make it obvious a network-enable audio device of identifying ones of the plurality of songs in the playlist that are not stored on the electronic device and providing information to the electronic device enabling the electronic device to obtain the ones of the plurality of songs that are not stored on the electronic device from at least one remote source (*check the electronic device's data storage space for songs listed on the assigned playlist and a network connection is made to upload the file if the songs needed to from the playlist are not stored on the electronic device's data storage space, see specification 0021*).

(Office Action at 3-4 (Feb. 2, 2011), Ex. 1009 (emphasis added).)

The manner in which the Examiner read the claim language demonstrates how one of ordinary skill in the art would have construed the claim. *Salazar v.*

*Procter & Gamble Co.*, 414 F.3d 1342, 1347 (Fed. Cir. 2005) (“Although unilateral statements by an examiner do not give rise to a clear disavowal of claim scope by an applicant, it does not necessarily follow that such statements are not pertinent to construing claim terms. Statements about a claim term made by an examiner during prosecution of an application may be evidence of how one of skill in the art understood the term at the time the application was filed.”).

Such is also consistent with the prosecution of the '652 patent. As noted above, both of the “not stored” and “assigned to” limitations were in originally filed dependent claims and were added to the independent claims in response to a rejection. The dependent claims clearly track the embodiments of the system described in the specification which are directed to assignment of playlists and storage of songs from the playlist, and not to a broader system not having storage.

Accordingly, “wherein ones of the plurality of songs are not stored on the electronic device,” read consistently with the specification, requires that the electronic device must have a storage space capable of storing songs. In other words, “wherein ones of the plurality of songs are not stored on the electronic device” cannot be construed to encompass an electronic device that has no storage space for songs at all. (Bove Decl. ¶¶ 15-18.)

In co-pending litigation, the Patent Owner has asserted that certain products infringe despite the fact that they do not have storage for storing songs. (*See, e.g.*,

Ex. 1008.) Once again, although it is submitted that a construction not requiring an ability to store songs is incorrect, the claim charts in the following sections apply to both the proper construction presented by Petitioner and the incorrect, broader construction asserted by the Patent Owner in co-pending litigation.

## **VII. IDENTIFICATION OF CHALLENGE**

Pursuant to 37 C.F.R. § 42.104(b), Petitioner respectfully requests the cancellation of claims 1-4, 6-8, 10, 11, 13, 14, 21, 22, 24-29, 31, 32, 34, 35, 42-45, 47-50, 52, 53, 55, and 56 of the '652 patent based on the grounds of invalidity set forth in this Petition.

### **A. Statutory Grounds For The Challenge Of Each Claim**

The statutory grounds for the challenge of each claim are set forth below.

All the statutory citations are pre-AIA.

#### **1. Grounds Based on U.S. Patent No. 6,587,127 to Leeke et al.**

**Ground 1 –** Anticipation under 35 U.S.C. § 102(e) of claims 1, 2, 4, 6, 7, 10, 11, 13, 14, 21, 22, 24, 25, 28, 31, 32, 34, 35, 42, 43, 45, 47, 48, 52, 53, 55, and 56 based on U.S. Patent No. 6,587,127 to Leeke et al. (“Leeke,” Ex. 1010).

**Ground 2–** Obviousness under 35 U.S.C. § 103(a) of claims 1, 2, 4, 6, 7, 10, 11, 13, 14, 21, 22, 24, 25, 28, 31, 32, 34, 35,

42, 43, 45, 47, 48, 52, 53, 55, and 56 based on Leeke.

**2. Grounds Based on PCT Pub. WO 99/38266 to Qureshey et al. and U.S. Patent No. 6,502,194 to Berman et al.**

**Ground 3** – Obviousness under 35 U.S.C. § 103(a) of claims 1-4, 6-8, 10, 13, 21, 22, 24-29, 31, 42-45, 47-50, and 52 based on PCT Publication WO 99/38266 to Qureshey et al. (“Qureshey,” Ex. 1011) in view of U.S. Patent No. 6,502,194 to Berman et al. (“Berman,” Ex. 1012).

**Ground 4** – Obviousness under 35 U.S.C. § 103(a) of Claims 11, 32, and 53 Based on Qureshey in View of Berman and Leeke.

**3. Grounds Based on Lansonic DAS-750**

**Ground 5** – Anticipation under 35 U.S.C. § 102(a) of claims 1, 2, 3, 4, 6, 7, 10, 21, 22, 24, 25, 27, 28, 29, 31, 42, 43, 44, 45, 47, 48, and 52 based on webpages describing the Lansonic DAS-750 (“Lansonic DAS-750,” Ex. 1013).

**Ground 6** – Obviousness under 35 U.S.C. § 103(a) of claims 1, 2, 3, 4, 6, 7, 8, 10, 21, 22, 24, 25, 26, 27, 28, 29, 31, 42, 43, 44, 45, 47, 48, 49, and 52 based on Lansonic DAS-750.

**4. Ground Based on U.S. Patent No. 7,187,947 to White et al.**

**Ground 7** – Obviousness under 35 U.S.C. § 103(a) of claims 1-4, 6, 7, 13, 21, 22, 24, 25, 27, 28, 34, 42-45, 47, and 48 based on U.S. Patent No. 7,187,947 to White et al. (“White” Ex. 1014).

Set forth below is a discussion of how the claims are unpatentable under the statutory grounds raised, including claim charts specifying where each element of a challenged claim is met by the prior art. 37 C.F.R. § 42.104(b)(4). The showing in these sections establishes a reasonable likelihood of prevailing as to each ground of invalidity with respect to the challenged claims as to that ground. This showing is accompanied by the Declaration of Dr. V. Michael Bove, Jr. (Ex. 1002) as noted above.

**B. Ground 1 – Anticipation Of Claims 1, 2, 4, 6, 7, 10, 11, 13, 14, 21, 22, 24, 25, 28, 31, 32, 34, 35, 42, 43, 45, 47, 48, 52, 53, 55, And 56 By Leeke**

Leeke was filed on November 24, 1998, and thus is prior art under 35 U.S.C. § 102(e) based on the earliest effective filing date of the '652 patent, *i.e.*, November 8, 2000. Leeke is titled “Content Player Method and Server with User Profile.” The Leeke system is illustrated in FIG. 1, reproduced below (on the next page).

As noted at 4:7-19, Leeke is directed to a system for providing audio content via an electronic network 100. The system includes a server 102 and a plurality of client apparatuses 104, one of which is illustrated in more detail at 106. Client apparatus 106 can communicate via the electronic network 100 using a wireless transceiver 126. (4:35-37.)

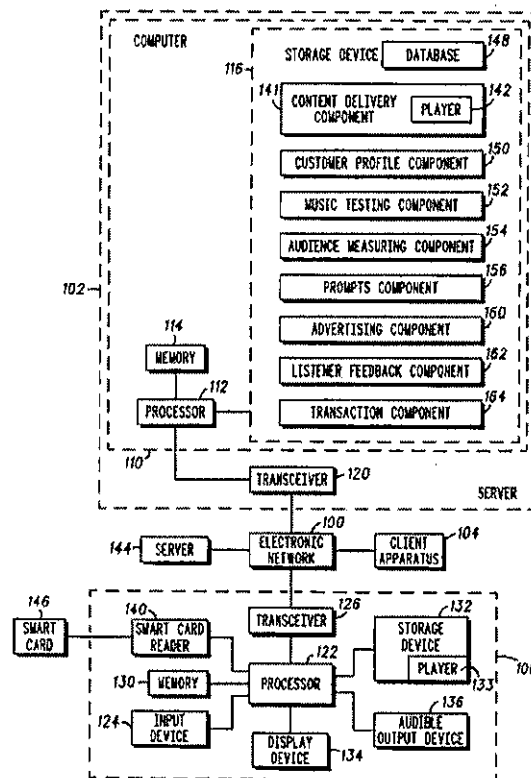


FIG. 1

Using one of several different methods, a user of client apparatus 106 selects a playlist of songs available on server 102. For example, using the interface illustrated in FIG. 2 below, the user can select a preset 202:



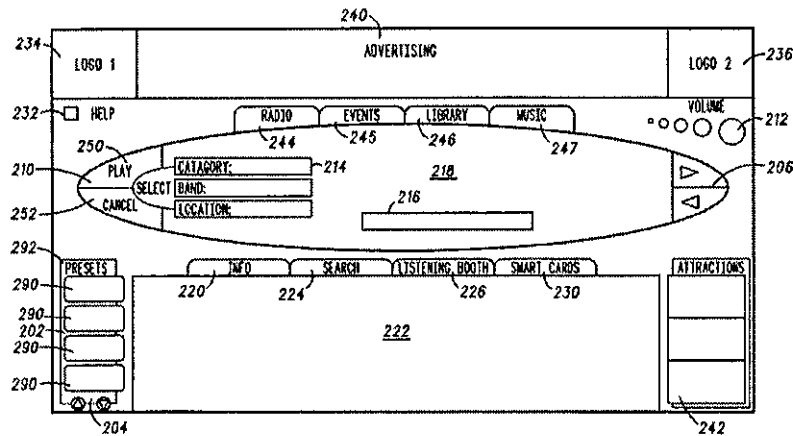


FIG. 2

Presets can be used to store access to a list of specific content, such as all songs by a certain artist, and are available across different client apparatuses. (9:61-10:14.)

Using the interface of FIGS. 20 and 21, a user may also select from a playlist using attribute selections 214 or track pick list 620. Upon selection of an attribute, a list of songs having the attribute is displayed. (19:48-20:16.) Track indicator 620 displays the current track and the number of tracks in the playlist. Clicking on track indicator 620 presents a pick list of tracks in the playlist. (20:43-49.)

Regardless of which method is used to receive a playlist of songs from server 102, upon selection of a song from the playlist, the client apparatus uses information in the playlist (*e.g.*, a URL) to obtain the selected song from server 102 (or another remote server 144) and play the song for the user. (5:1-4.)

As noted at 20:64-21:6 with reference to FIG. 2, upon request, the display region 222 can be used to provide additional information about the currently playing song, including, for example, album cover images and producer and writer

credits. Similarly, client apparatus 106 includes a “listening booth” feature that provides new music for the user to listen to upon selection. The music provided is determined though the past listening behavior of the user. (22:1-15; 33:27-34:6.)

As illustrated in FIG. 2, client apparatus 106 also allows a user to select from various categories 244-247 (*i.e.*, modes of operation), including radio category 244. (7:63-8:16.) The radio category includes broadcast AM and FM radio and Internet radio broadcasts. (8:3-6.) To play Internet radio the user selects a station from a graphical radio dial, *e.g.*, as shown in FIG. 7 (12:12-13:21.)

Leeke discloses each element of claims 1, 2, 4, 6, 7, 10, 11, 13, 14, 21, 22, 24, 25, 28, 31, 32, 34, 35, 42, 43, 45, 47, 48, 52, 53, 55, and 56 of the '652 patent, under the Patent Owner’s broad construction of the term “playlist assigned to the electronic device.” According to the Patent Owner, this term encompasses a playlist that has been requested from the device without any actual selection of a device, *i.e.*, without any act of assigning to the device. (*See* Patent Owner ITC Claim Chart re Toshiba (Ex. 1008) at 8-9.) Leeke discloses Internet radio and playlist modes of operation as claimed. Set forth below is a claim chart that specifies where each element of a challenged claim is met by Leeke.

Claim	U.S. Patent 6,587,127 to Leeke <i>et al.</i>
1. An electronic device comprising:	
a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively	The basic configuration is illustrated in FIG. 1 and described at 4:12-5:48. Client apparatus 106 is an electronic device and includes a network interface coupling the

Claim	U.S. Patent 6,587,127 to Leeke <i>et al.</i>
<p>couple the electronic device to a central system;</p>	<p>device to a sever 102, <i>i.e.</i>, a central system. <i>See, e.g.</i>, 4:24:27 (“Regardless of its form, the client apparatus 106 typically includes . . . a transceiver 126 . . .”); 4:35-37 (“The transceiver 126 can include a modem, a network adapter, or a wireless transceiver to communicate signals via the electronic network 100.”); 4:13-15.</p> <p>Client apparatus 106 receives an Internet radio broadcast. <i>See, e.g.</i>, FIG. 7; 8:3-6 (“The radio category includes content available from over-the-air broadcasts (including but not limited to AM and FM broadcasts) and Internet broadcast material encoded and distributed through the electronic network 100.”); 12:51-53.</p>
<p>b) a system enabling playback of audio content from a playlist assigned to the electronic device via the central system; and</p>	<p>Numerous different types of playlists are disclosed, including playlists, presets, and attribute fields (<i>e.g.</i>, category, artist, or album). <i>See, e.g.</i>, 19:59-20:22 (“The graphical user interface provides multiple ways to navigate to content in the music category. A first way includes using the selection attribute indicators 214 to select content having chosen attributes . . .”); 20:23-29 (“A second way to navigate music content is to use a preset.”); 10:5-10 (“Presets may be used to store access to specific content or titles, or may be used to specify sets of titles. For example, a first preset can specify a set of all stations that broadcast jazz, and a second preset can specify all recordings of a particular artist.”); 20:30-42 (“A third way to navigate to music content is to use a smart card (either physical or virtual). . . . Smart cards also facilitate access to specific titles as part of a playlist. In this case, the end</p>

Claim	U.S. Patent 6,587,127 to Leeke <i>et al.</i>
	<p>user can specify and save a playlist of titles to the smart card.”); <i>see also</i> 23:47-24:2; FIGS. 2, 20, 21, and 33.</p> <p>The playlist is assigned to client apparatus 106. The playlist information can be stored on the server and made available, <i>i.e.</i>, assigned, to the device with a particular virtual smart card. <i>See, e.g.</i>, 5:21-24; 17:27-32; 20:38-42.</p>
<p>c) a control system associated with the network interface and the system enabling playback of the audio content indicated by the playlist, and adapted to:</p>	<p>Client apparatus 106 includes control processor 122 associated with transceiver 126. <i>See, e.g.</i>, FIG. 1; 4:12-30.</p>
<p>i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;</p>	<p>A user can select from plural modes, including an Internet radio mode and a playlist mode. 7:63-8:2 (“The categorical selection controls 200 are designated to receive user-initiated actions to choose a content category within which audio content can be selected. The categorical selection controls 200 include a radio category control 244, an events category control 245, a library category control 246, and a music category control 247.”).</p> <p>The music category includes playlist modes. 19:48-20:49. The radio category includes Internet radio. <i>See claim 1(a).</i></p>
<p>ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and</p>	<p><i>See claim 1(a).</i></p>
<p>iii) when the desired mode of operation is the playlist mode of operation: receive the playlist assigned to the electronic device from the central system, the playlist</p>	<p>Client apparatus 106 receives a playlist assigned to it from server 102. The playlist can be stored on server 102 and the server 102 thus sends the playlist to client apparatus 106 for a user to select from the</p>

Claim	U.S. Patent 6,587,127 to Leeke <i>et al.</i>
<p>identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;</p>	<p>playlist. <i>See, e.g.</i>, 17:29-30 (“For example, the playlist information can be stored by the storage device 116 of the server 102 . . . .”); <i>see also</i> claim 1(b).</p> <p>The playlist identifies plural songs. <i>See, e.g.</i>, 20:12-16 (“ . . . The list of titles can include album titles and song titles.”); <i>see also</i> claim 1(b). The songs identified in a playlist can be stored on servers, <i>i.e.</i>, not client apparatus 106. <i>See, e.g.</i>, 5:1-4.</p> <p>Client apparatus 106 can be a general purpose or network computer and includes a storage device 132 such as a hard drive to store data. <i>See, e.g.</i>, 4:21-49. Audio content can be cached to storage device 132 and pre-buffered for streaming. <i>See, e.g.</i>, 48:38-42. Content can be and delivered electronically, and the client apparatus thus includes storage for songs. <i>See, e.g.</i>, 33:10-12; 35:26-34; 40:19-25; 50:41-52.</p>
<p>receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;</p>	<p>The server 102 and servers 144 are remote sources. The displayed playlist has information associated with it, such as URLs, that enable the player to obtain the songs from a remote source. <i>See, e.g.</i>, 19:59-20:49; 4:50-67; 49:12-16; 5:33-35; 43:14-17 (“The media location can be in the form of an electronic address, such as a URL or a Uniform Resource Name (URN), for accessing the content via the electronic network 100.”).</p>
<p>obtain the ones of the plurality of songs from the at least one remote source; and</p>	<p>Client apparatus 106 obtains songs from a remote server. <i>See, e.g.</i>, FIG. 1; 4:7-8; 5:1-4 (“The player 142 accesses audio content either locally from the server 102 or remotely from a server 144, and communicates the audio content to the</p>

Claim	U.S. Patent 6,587,127 to Leeke <i>et al.</i>
	client apparatus 106 using streaming technology.”)
play the audio content indicated by the playlist.	Client apparatus 106 plays the audio content indicated by the playlist. <i>See, e.g.</i> , 20:40-42 (“When an item from a playlist is selected, its attributes populate the attribute fields 262, 264, and 266, and the item is cued for play.”)
2. The electronic device of claim 1 wherein the control system is further adapted to enable playback from a broadcast radio source.	Client apparatus 106 is capable of playback from a broadcast radio source. <i>See, e.g.</i> , 8:3-6.
4. The electronic device of claim 1 further comprising a data storage device, wherein the control system is further adapted to enable playback from the data storage device.	Client apparatus 106 is capable of playback of content from its storage device 132. <i>See, e.g.</i> , 49:16-20.
6. The electronic device of claim 1 wherein the control system is further adapted to: display a list of Internet radio broadcast stations.	Client apparatus 106 displays a list of Internet radio stations. <i>See, e.g.</i> , FIG. 37; 26:66-27:2 (“...A station pick list 872 allows for a user selection of all stations from the radio dial 870.”); 12:12-14:29; <i>see also</i> claim 1(a).
7. The electronic device of claim 1 further comprising a wireless transceiver communicatively coupled to the control system.	Client apparatus 106 can include a wireless transceiver. <i>See, e.g.</i> , 4:24-27; 4:35-37.
10. The electronic device of claim 1 further comprising at least one speaker.	Client apparatus 106 includes a speaker 136. <i>See, e.g.</i> , FIG. 1; 4:24-49.
11. The electronic device of claim 1 wherein the control system is further adapted to: a) send a request to a remote server for supplemental information related to a song in real-time while the song is playing; b) receive the supplemental information from the remote server;	Client apparatus 106 allows a user to request and receive supplemental information via server 102 about a currently playing song. <i>See, e.g.</i> , 14:31-51; 20:64-21:6 (“the second display region 222 can be used to provide auxiliary information about music content. The auxiliary information is displayed in

Claim	U.S. Patent 6,587,127 to Leeke <i>et al.</i>
and c) present the supplemental information to the user of the electronic device.	response to receiving a user-initiated selection of the information control 220, which includes the text 'ALBUM INFO' for music content.").
13. The electronic device of claim 1 wherein the control system is further adapted to: receive and display a recommended song.	Client apparatus 106 includes a "listening booth" feature that receives and displays recommended songs. <i>See, e.g.</i> , 22:4-6; 33:62-34:4 ("The [listening booth] display includes a plurality of options 1334 for categories or genres of music content . . . The categories can be dependent upon the personal profile or preferences of the end user collected when the user profile is created. Alternatively, the categories can be dependent upon the end user's listening behavior using the player."); 22:1-45; 31:18-30; 33:27-34:6.
14. The electronic device of claim 13 wherein the control system is further adapted to: provide an option to listen to the recommended song.	<i>See</i> claim 13.
21. An electronic device comprising:	
a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively couple the electronic device to a central system;	<i>See</i> claim 1(a).
b) a system enabling playback of audio content from a plurality of additional content sources comprising a playlist assigned to the electronic device via the central system; and	<i>See</i> claim 1(b) and 1(c)(i).
c) a control system associated with the network interface and the system enabling playback of the audio content from the plurality of	<i>See</i> claim 1(c).

Claim	U.S. Patent 6,587,127 to Leeke <i>et al.</i>
additional content sources, and adapted to:	
i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a plurality of additional modes of operation each corresponding to one of the plurality of additional content sources;	<i>See claim 1(c)(i).</i> Plural additional modes include, <i>e.g.</i> , playlist (music) mode and broadcast radio.
ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	<i>See claim 1(c)(ii).</i>
iii) play the audio content from one of the plurality of additional content sources when the desired mode of operation is a corresponding one of the plurality of additional modes of operation, where when in a playlist mode of operation, the control system is further adapted to:	<i>See claim 1(c)(i) and (ii).</i>
receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	<i>See claim 1(c)(iii).</i>
receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	<i>See claim 1(c)(iii).</i>
obtain the ones of the plurality of songs from the at least one remote source; and	<i>See claim 1(c)(iii).</i>
play the audio content indicated by	<i>See claim 1(c)(iii).</i>



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the playlist.	
22. The electronic device of claim 21 wherein the plurality of additional content sources further comprises a data storage device of the electronic device.	<i>See claim 4.</i>
24. The electronic device of claim 21 wherein the control system is further adapted to: display a list of Internet radio broadcast stations.	<i>See claim 6.</i>
25. The electronic device of claim 21 further comprising a wireless transceiver communicatively coupled to the control system.	<i>See claim 7.</i>
28. The electronic device of claim 21 wherein the plurality of additional content sources include a broadcast radio source.	<i>See claim 2.</i>
31. The electronic device of claim 21 further comprising at least one speaker.	<i>See claim 10.</i>
32. The electronic device of claim 21 wherein the control system is further adapted to: a) send a request to a remote server for supplemental information related to a song in real-time while the song is playing; b) receive the supplemental information from the remote server; and c) present the supplemental information to the user of the electronic device.	<i>See claim 11.</i>
34. The electronic device of claim 21 wherein the control system is further adapted to: receive and display a recommended song.	<i>See claim 13.</i>
35. The electronic device of claim 34 wherein the control system is further	<i>See claim 14.</i>

Claim	U.S. Patent 6,587,127 to Leeke <i>et al.</i>
adapted to: provide an option to listen to the recommended song.	
42. A method of operation for an electronic device comprising:	
a) enabling a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;	<i>See claim 1(c)(i).</i>
b) playing an Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	<i>See claim 1(c)(ii).</i>
c) when the desired mode of operation is the playlist mode of operation: i) receiving a playlist assigned to the electronic device via a central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	<i>See claim 1(c)(iii).</i>
ii) receiving information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	<i>See claim 1(c)(iii).</i>
iii) obtaining the ones of the plurality of songs from the at least one remote source; and	<i>See claim 1(c)(iii).</i>
iv) playing audio content indicated by the playlist.	<i>See claim 1(c)(iii).</i>
43. The method of claim 42 further comprising: a) receiving audio content from a broadcast radio source; and b) playing the audio content from the broadcast radio	<i>See claim 2.</i>

Claim	U.S. Patent 6,587,127 to Leeke <i>et al.</i>
source.	
45. The method of claim 42 further comprising: a) obtaining audio content from a data storage device of the electronic device; and b) playing the audio content from the data storage device.	<i>See claim 4.</i>
47. The method of claim 42 further comprising displaying a list of Internet radio broadcast stations.	<i>See claim 6.</i>
48. The method of claim 42 wherein obtaining the ones of the plurality of songs from the at least one remote source comprises receiving the ones of the plurality of songs from the at least one remote source via a wireless transceiver of the electronic device.	<i>See claims 1(c) and 7.</i>
52. The method of claim 42 further comprising playing the audio content through at least one speaker.	<i>See claim 10.</i>
53. The method of claim 42 further comprising: a) sending a request to a remote server for supplemental information related to a song in real-time while the song is playing; b) receiving the supplemental information from the remote server; and c) presenting the supplemental information to the user of the electronic device.	<i>See claim 11.</i>
55. The method of claim 42 further comprising receiving and displaying a recommended song.	<i>See claim 13.</i>
56. The method of claim 55 further comprising providing an option to listen to the recommended song.	<i>See claim 14.</i>

**C. Ground 2 – Obviousness Of Claims 1, 2, 4, 6, 7, 10, 11, 13, 14, 21, 22, 24, 25, 28, 31, 32, 34, 35, 42, 43, 45, 47, 48, 52, 53, 55, And 56 In View Of Leeke**

Leeke anticipates the above-identified claims for the reasons set forth above.

However, if it is determined that Leeke does not anticipate the claims based upon, for example, a claim construction that requires selection of a playlist from another device to be assigned to the device, it is submitted that the claims would be obvious in view of Leeke. It would have been obvious in view of Leeke to select a device from among the various client apparatuses 104 to receive a playlist via the server 102 in view of the disclosure transferring playlists between a plurality of access points for the end user as noted at 20:38-40. (Bove Decl. ¶¶ 19-20.)

**D. Ground 3 – Obviousness Of Claims 1-4, 6-8, 10, 13, 21, 22, 24-29, 31, 42-45, 47-50, And 52 Based On Qureshey In View Of Berman**

**1. Qureshey**

Qureshey is a PCT application published on July 29, 1999, and thus qualifies as prior art under 35 U.S.C. § 102(b) based on the earliest effective filing date of the '652 patent, *i.e.*, November 8, 2000. Qureshey is a corresponding foreign application to the parent '127 and '703 applications to which priority is claimed in the '652 patent. However, it was not cited during prosecution of the '652 patent.

Qureshey includes Figures 1-5, 6A, 6B, and 7-10, which are identical to the corresponding figures in the '652 patent. The disclosure in Qureshey essentially corresponds to the disclosure in the '652 specification relating to these figures.

This disclosure in Qureshey constitutes substantially the entire disclosure of the '652 patent relating to Internet radio.

More specifically, Qureshey discloses a radio apparatus that allows a user to receive an Internet radio broadcast. (1:28-30.) As noted at 4:8-12 and 8:18-25, and shown in FIG. 3E of Qureshey, the radio apparatus allows a user to select a Web broadcast from a list of available Web broadcasts.

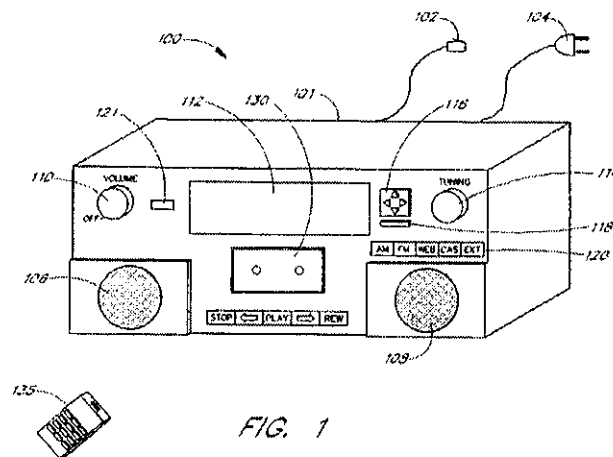


FIG. 1

As shown in FIG. 1 of Qureshey, reproduced below, the radio apparatus includes a button bar 120 that allows the user to select from several audio sources (*i.e.*, modes of operation), including, for example, AM or FM broadcast radio, Internet radio, cassette, and an external input. (5:11-12.) Radio apparatus 100 can include other audio sources, such as an audio CD or a DVD. (6:26-27). The radio apparatus can be operated using a wireless remote 135, as shown in FIG. 1 above, and can also include a wireless transceiver. (4:26-28.)

## 2. Berman

Berman was filed on April 16, 1999, and thus qualifies as prior art under 35 U.S.C. § 102(e) based on the earliest effective filing date of the '652 patent, *i.e.*, November 8, 2000. Berman discloses an audio on demand system for playing songs from playlists via a network; the Berman system is illustrated in FIG. 1:

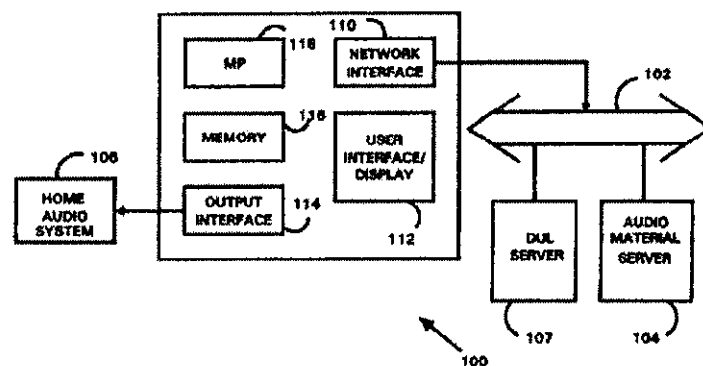
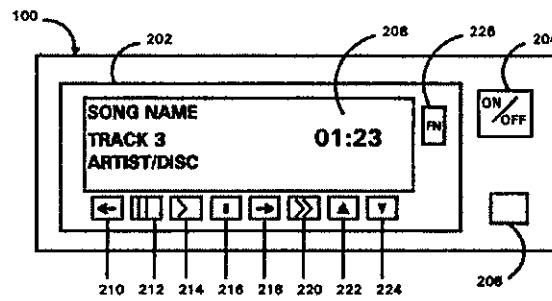


FIG. 1

As noted at 3:33-39, Berman discloses a playback apparatus that provides an interface to network audio files that are retrieved in real time in response to user selection. The playback unit 100 resembles a home audio component (5:8-11) and includes a network interface 110. It receives audio material from an audio material server 104 via a network 102 such as the Internet, and provides it to a home audio system 106 for playback. (4:47-53.) An output interface 114 processes audio material and provides it to the home audio system 106; this connection can be a direct connection to speakers. (5:65-6:6.) The playback unit 100 may also receive input from a wireless remote control. (5:46-49.)

The playback unit includes a display interface having a touch panel screen, as illustrated in FIG. 2. The display interface includes operation buttons including cursor navigation up and down buttons. (5:42-62.)



As discussed beginning at 6:64, the user selects a music category or type of song desired for playback from a list, which may include categories such as artist, song title, album, and musical genres. In response to the user's initial selection, the current song list is first sent to the directory and user list (DUL) server 107. The server checks to see if the current song list is up to date and sends an updated song list back to the playback unit 100. The user then selects a song for playback. The playback unit 100 sends a song request to the audio material server 104, and the audio material server transmits song data packets to the playback unit.

Thus, Qureshey discloses a network receiver that receives Internet radio broadcasts, and additionally discloses that numerous other audio sources may be provided. Berman discloses a network receiver that receives and plays songs from a playlist via the Internet. It would have been obvious to one of ordinary skill in the art to include an audio on demand feature as disclosed in Berman in the system

of Qureshey. Both references relate to a home audio device that plays audio from a remote source via a network interface, with each device offering different features. A person of skill in the art would have easily recognized that the Internet radio receiver of Qureshey could have been improved by including the audio on demand features of Berman. (Bove Decl. ¶¶ 21-23.) Such audio on demand feature, accessed through the same network interface as the Internet radio, would provide another desirable audio source. Indeed, Qureshey discloses the provision of numerous audio sources in addition to Internet radio, and the audio on demand source would simply be another logical source to provide. Set forth below is a claim chart that specifies where each element of a challenged claim is met by the combined disclosures of Qureshey and Berman.

Claim	Qureshey In View Of Berman
1. An electronic device comprising:	
a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively couple the electronic device to a central system;	<p>Qureshey discloses a device that receives an Internet radio broadcast via a network interface. <i>See, e.g.</i>, Abstract (“An intelligent radio apparatus (100) that is adapted to receive Web radio broadcasts is disclosed.”); 4:6-9; 4:17-23; 7:15-21.</p> <p>Berman includes a network interface 110 that communicatively couples the device to audio material servers 104 and DUL server 107, <i>i.e.</i>, a central system. <i>See, e.g.</i>, 4:48-51; 5:11-14; FIG. 1.</p>
b) a system enabling playback of audio content from a playlist assigned to the electronic device via the central system; and	Berman enables playback of audio content from a playlist. <i>See, e.g.</i> , 4:51-53; 7:22-24 (“With a confirmed current song list, the user is now permitted to select a track from



Claim	Qureshey In View Of Berman
	<p>among those available in a selection menu.”); 6:64-7:4; 7:14-8:43; FIGS. 2-4, 8.</p> <p>The DUL server sends a song list to the playback unit, <i>i.e.</i>, assigns the song list to the unit. <i>See, e.g.</i>, 10:23-28 (“FIG. 8 shows the updated song list packet, which is sent from the DUL server to the playback unit. The first eight bytes contain the user ID, which in this case is returned to the playback unit for purposes of error checking, to confirm that the updated song list information was sent to and received by the correct playback unit.”); FIG. 8; 7:3-13.</p>
<p>c) a control system associated with the network interface and the system enabling playback of the audio content indicated by the playlist, and adapted to:</p>	<p>Playback unit 100 of Berman includes a control system providing a user interface enabling playback of the audio content indicated by the playlist. <i>See, e.g.</i>, 3:56-59; 5:41-62; FIG. 2. <i>See also</i> claim 1(b).</p>
<p>i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;</p>	<p>Qureshey includes a control system that enables mode selection. <i>See, e.g.</i>, 5:11-12 (“The button bar 120 provides buttons to select an audio source, including, for example, ‘AM’ radio, ‘FM’ radio, ‘Web’ radio, ‘Cassette’, and ‘External’ input.”); 6:25-27 (“Other optional audio sources may be provided, such as, for example, an audio CD, a DVD, a digital audio tape unit, etc.”).</p>
<p>ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and</p>	<p>Qureshey discloses receiving and playing an Internet radio broadcast. <i>See</i> claim 1(a).</p>
<p>iii) when the desired mode of operation is the playlist mode of operation: receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of</p>	<p>Playback unit 100 of Berman receives a song list from the DUL server 107. <i>See, e.g.</i>, FIG. 3, step 308 (“DUL SENDS UPDATED SONG LIST TO PLAYBACK UNIT.”); 9:47-49; FIG. 8; 7:14-19. The DUL server assigns the playlist to the playback device. <i>See</i> claim 1(b).</p>

Claim	Qureshey In View Of Berman
songs are not stored on the electronic device;	The songs identified in the playlist are stored on the audio material server 104, <i>i.e.</i> , not on the playback unit 100. <i>See, e.g.</i> , 4:51-52 (“The playback unit receives audio material from an audio material server”). The playback unit includes buffer memory to store portions of songs. 11:27-12:62. Recording may also be permitted (8:4-6), and the device thus has storage for songs.
receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	Playback unit 100 receives from the central system a uniform resource locator (URL) of the audio material server 104 at which the song data is stored, enabling the playback unit to obtain the song from the audio material server. <i>See, e.g.</i> , FIG. 3, step 314; 7:29-54; 9:49-51; FIG. 9.
obtain the ones of the plurality of songs from the at least one remote source; and	Playback unit 100 receives song data packets from the audio material server 104. <i>See, e.g.</i> , FIG. 4, step 412 (“AUDIO MATERIAL SERVER TRANSMITS SONG DATA PACKETS.”); 8:31-34 (“the audio material server transmits the audio material (comprising a sound file or streaming audio information) to the playback unit, where it is received by the network interface...”); 9:51-52; FIG. 10, FIG. 4; 3:33-39; 4:48-53; 9:7-15.
play the audio content indicated by the playlist.	Playback unit 100 plays audio content indicated by the playlist. 8:27-36. <i>See also</i> claim 1(b).
2. The electronic device of claim 1 wherein the control system is further adapted to enable playback from a broadcast radio source.	Qureshey discloses playback from a broadcast radio source. <i>See, e.g.</i> , 7:7 (“When the button bar 120 is set to ‘FM,’ the intelligent radio 100 operates in FM radio mode.”); 6:25-7:2.
3. The electronic device of claim 1 wherein the control system is further adapted to enable playback from an	Qureshey discloses playback from a variety of sources, including an optical disc. <i>See, e.g.</i> , 6:26-27 (“Other optional audio sources

Claim	Qureshey In View Of Berman
optical disc.	may be provided, such as, for example, an audio CD, a DVD, a digital audio tape unit, etc.”).
4. The electronic device of claim 1 further comprising a data storage device, wherein the control system is further adapted to enable playback from the data storage device.	Qureshey discloses playback from a data storage device. <i>See, e.g.</i> , 5:24-25 (“The data storage device 210 may also provide storage for digitized audio material, such as recorded Web radio broadcasts, CD-Audio, etc.”).
6. The electronic device of claim 1 wherein the control system is further adapted to: display a list of Internet radio broadcast stations.	Qureshey displays a list of Internet radio broadcast stations. <i>See, e.g.</i> , 8:18-20; 4:8-9; <i>see also</i> claim 1(a).
7. The electronic device of claim 1 further comprising a wireless transceiver communicatively coupled to the control system.	Qureshey discloses a wireless transceiver 1010. <i>See</i> FIG. 10; 12:21-13-5.
8. The electronic device of claim 1 wherein the electronic device is further adapted to receive input from a wireless remote control having a navigation shuttle.	<p>Qureshey discloses a receiver to receive signals from a wireless remote having a navigation shuttle. <i>See, e.g.</i>, FIG. 1, remote 135; 4:31-32 (“A user uses buttons on the control panel (or remote control) to scroll through the display and select a Web radio broadcast ‘station’ for listening.”)</p> <p>Berman also discloses receiving input from a wireless remote control. <i>See, e.g.</i>, 5:46-49. The remote control unit has a navigation shuttle. <i>See, e.g.</i>, 13:51-64 (search functions “can be instantiations of objects that are part of the graphical user interface (GUI) of the user display” and the GUI “may be replicated on a remote control device.”); FIG. 2; 5:57 (cursor navigation up 222 and down 224).</p>
10. The electronic device of claim 1 further comprising at least one speaker.	Qureshey discloses speakers 106 and 108. FIGS. 1, 2, 9 and 10; 5:14-15. Berman also discloses speakers. <i>See, e.g.</i> , 5:67-6:2.

Claim	Qureshey In View Of Berman
13. The electronic device of claim 1 wherein the control system is further adapted to: receive and display a recommended song.	Berman receives and displays songs and its control system is therefore adapted to display a recommended song. Updating of song list by DUL server based upon search criteria such as genre includes recommended songs. <i>See, e.g.</i> , 6:64-7:19; 13:9-15.
21. An electronic device comprising:	
a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively couple the electronic device to a central system;	Both Qureshey and Berman disclose a network interface. <i>See</i> claim 1(a).
b) a system enabling playback of audio content from a plurality of additional content sources comprising a playlist assigned to the electronic device via the central system; and	Qureshey discloses plural sources. <i>See, e.g.</i> , 6:26-27 (“Other optional audio sources may be provided, such as, for example, an audio CD, a DVD, a digital audio tape unit, etc.”). Berman discloses a playlist assigned to the electronic device via the central system. <i>See</i> claims 1(b) and 1(c).
c) a control system associated with the network interface and the system enabling playback of the audio content from the plurality of additional content sources, and adapted to:	<i>See</i> claim 1(c).
i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a plurality of additional modes of operation each corresponding to one of the plurality of additional content sources;	Qureshey discloses selection of a desired mode from a plurality of modes of operation corresponding to content sources, <i>e.g.</i> , broadcast and Internet radio, cassette, and CD. <i>See</i> claims 1(c)(i), 2, and 3.
ii) receive and play the Internet	Qureshey discloses playing an Internet radio

Claim	Qureshey In View Of Berman
radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	broadcast. <i>See</i> claim 1(c)(ii).
iii) play the audio content from one of the plurality of additional content sources when the desired mode of operation is a corresponding one of the plurality of additional modes of operation, where when in a playlist mode of operation, the control system is further adapted to:	Qureshey discloses playing content from additional content sources. <i>See</i> claim 1(c)(i) and (ii).
receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	Berman discloses receiving a playlist from the central system. <i>See</i> claim 1(c)(iii).
receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	Berman discloses receiving information enabling the device to obtain songs. <i>See</i> claim 1(c)(iii).
obtain the ones of the plurality of songs from the at least one remote source; and	Berman discloses obtaining the songs. <i>See</i> claim 1(c)(iii).
play the audio content indicated by the playlist.	Berman discloses playing the songs. <i>See</i> claim 1(c)(iii).
22. The electronic device of claim 21 wherein the plurality of additional content sources further comprises a data storage device of the electronic device.	<i>See</i> claim 4.
24. The electronic device of claim 21 wherein the control system is further adapted to: display a list of Internet radio broadcast stations.	<i>See</i> claim 6.
25. The electronic device of claim 21 further comprising a wireless	<i>See</i> claim 7.

Claim	Qureshey In View Of Berman
transceiver communicatively coupled to the control system.	
26. The electronic device of claim 21 wherein the electronic device is further adapted to receive input from a wireless remote control having a navigation shuttle.	<i>See claim 8.</i>
27. The electronic device of claim 21 wherein the system further enables playback from an optical disc.	<i>See claim 3.</i>
28. The electronic device of claim 21 wherein the plurality of additional content sources include a broadcast radio source.	<i>See claim 2.</i>
29. The electronic device of claim 21 wherein the plurality of additional content sources include an optical disc source.	<i>See claim 3.</i>
31. The electronic device of claim 21 further comprising at least one speaker.	<i>See claim 10.</i>
42. A method of operation for an electronic device comprising:	
a) enabling a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;	Qureshey discloses selection from plural modes including an Internet radio mode. Berman discloses a playlist mode. <i>See claim 1(c)(i).</i>
b) playing an Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	Qureshey discloses playing an Internet radio broadcast. <i>See claim 1(c)(ii).</i>
c) when the desired mode of operation is the playlist mode of operation: i) receiving a playlist assigned to the electronic device via	Berman discloses receiving a playlist assigned to the device. <i>See claim 1(c)(iii).</i>

Claim	Qureshey In View Of Berman
a central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	
ii) receiving information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	Berman discloses receiving information enabling the device to obtain songs. <i>See</i> claim 1(c)(iii).
iii) obtaining the ones of the plurality of songs from the at least one remote source; and	Berman discloses obtaining songs. <i>See</i> claim 1(c)(iii).
iv) playing audio content indicated by the playlist.	Berman discloses playing songs from the playlist. <i>See</i> claim 1(c)(iii).
43. The method of claim 42 further comprising: a) receiving audio content from a broadcast radio source; and b) playing the audio content from the broadcast radio source.	<i>See</i> claim 2.
44. The method of claim 42 further comprising: a) obtaining audio content from an optical disc; and b) playing the audio content from the optical disc.	<i>See</i> claim 3.
45. The method of claim 42 further comprising: a) obtaining audio content from a data storage device of the electronic device; and b) playing the audio content from the data storage device.	<i>See</i> claim 4.
47. The method of claim 42 further comprising displaying a list of Internet radio broadcast stations.	<i>See</i> claim 6.
48. The method of claim 42 wherein obtaining the ones of the plurality of songs from the at least one remote	<i>See</i> claims 1(c) and 7.

Claim	Qureshey In View Of Berman
source comprises receiving the ones of the plurality of songs from the at least one remote source via a wireless transceiver of the electronic device.	
49. The method of claim 42 further comprising: receiving input from a wireless remote control that enables navigating the playlist.	<i>See claim 8.</i>
50. The method of claim 42 further comprising enabling playback from an optical disc.	<i>See claim 3.</i>
52. The method of claim 42 further comprising playing the audio content through at least one speaker.	<i>See claim 10.</i>

**E. Ground 4 – Obviousness Of Claims 11, 32, And 53 Based On Qureshey In View Of Berman And Leeke**

Claims 11, 32, and 53 recite that supplemental information related to a song is received and displayed in response to a request. Berman discloses the display of supplemental information relating to a song in FIG. 2 and 5:51-53. Berman does not disclose whether the supplemental information is provided in response to a request. As noted above in the claim chart for claim 11, Leeke discloses provision of supplemental information in response to a request. It would have been obvious to provide the supplemental information display in Berman in response to a request in view of Leeke, as such is simply applying a known technique to a known device. (Bove Decl. ¶ 24.)



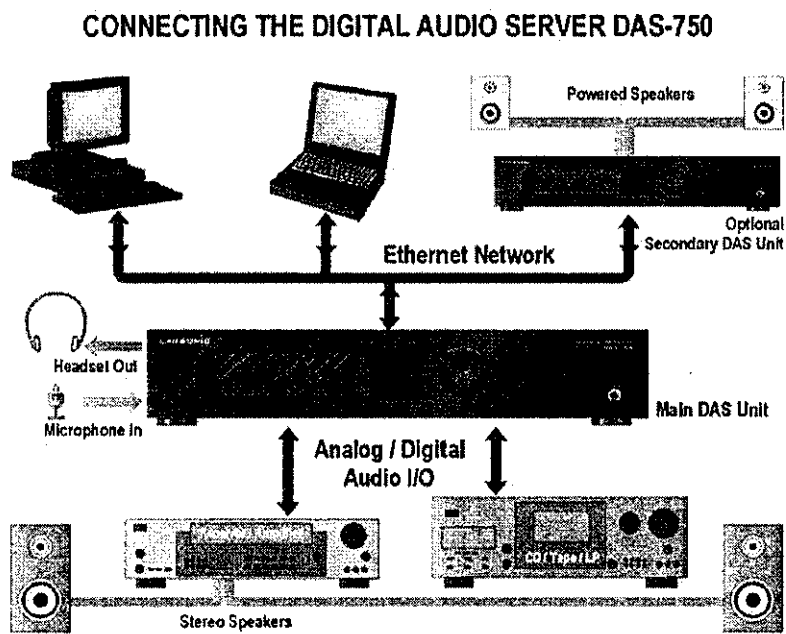
**F. Ground 5 – Anticipation Of Claims 1, 2, 3, 4, 6, 7, 10, 21, 22, 24, 25, 27, 28, 29, 31, 42, 43, 44, 45, 47, 48, And 52 Based On Lansonic**

The Lansonic reference relates to a product called the Lansonic Digital Audio Server DAS-750. The reference, which is attached as Ex. 1013, is comprised of webpages that were posted on Lansonic's website at least by September 18, 2000. The webpages available on Lansonic's website in 2000 were accessed using the Internet Archive Wayback Machine, which "is a service that allows people to visit archived versions of Web sites." *See Frequently Asked Questions*, INTERNET ARCHIVE, <http://archive.org/about/faqs.php> (last visited August 26, 2013). The webpages were accessed by clicking an option in the navigation menu on the Lansonic home page, as seen on page 1 of Ex. 1013.

The Lansonic webpages, which were available at least by September 18, 2000, collectively constitute a single reference publication and thus is prior art under 35 U.S.C. § 102(a) based on the earliest possible effective filing date of the '652 patent, *i.e.*, November 8, 2000. Alternatively, if the Lansonic webpages do not constitute one reference, each qualifies as an individual reference, and as discussed further in Section VII.G, the claims of the '652 patent would have been obvious under 35 U.S.C. § 103 in view of the Lansonic webpages.

The DAS-750 is a digital audio server that allows the user to playback audio available either locally or through the network. The system can play playlists

assigned to it and can also play Internet radio. The system is illustrated at Ex. 1013 at 4:



The DAS-750 supports “a host of playlist capabilities.” (See Ex. 1013 at 3.) One of these capabilities allows the user to create a playlist of songs on a PC and transfer (*i.e.*, assign) the playlist to a networked DAS-750. (See Ex. 1013 at 17.) Some of the songs on the playlist may be stored on other devices, as the DAS-750 can be set up to play songs stored on PCs and other DAS-750 devices. (See Ex. 1013 at 3 and 9.) To play the playlist, the user selects the playlist from a menu, as seen on the display at Ex. 1013 at 7-8. If the song to be played is not stored locally, the device requests the song from the remote source, and it is transferred across the network to the device. (See Ex. 1013 at 2-3.) In order to play the

remotely stored songs, the playlist necessarily has information enabling the device to obtain the songs from the remote source. (Bove Decl. ¶ 26.)

It is submitted that Lansononic discloses each element of claims 1, 2, 3, 4, 6, 7, 10, 21, 22, 24, 25, 27, 28, 29, 31, 42, 43, 44, 45, 47, 48, and 52 of the '652 patent. Lansononic discloses an Internet radio mode of operation and a playlist mode of operation, where the device receives an assigned playlist from a central system, receives information enabling the device to obtain songs in the playlist, and obtains the songs as claimed. Set forth below is a claim chart that specifies where each element of a challenged claim is met by Lansononic.

<b>Claim</b>	<b>Lansononic DAS-750</b>
<p>1. An electronic device comprising:  a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively couple the electronic device to a central system;</p>	<p>The DAS-750, an electronic device, includes a network interface enabling the device to receive an Internet radio broadcast. <i>See, e.g.</i>, Product (Ex. 1013 at 3)<sup>1</sup> (“The DAS-750 features a built-in Ethernet interface to network digital audio through a Local Area Network (LAN).”); FAQ (Ex. 1013 at 9); Product (Ex. 1013 at 3) (“Any DAS unit can be set for reception of streaming MP3 audio from an array of Internet radio sites from around the world.”); Capability (Ex. 1013 at</p>

<sup>1</sup> The Lansononic reference (Ex. 1013) consists of pages from the Lansononic website. Ex. 1013 is marked with Bates numbers identifying each page. The citations in this claim chart identify both the page heading and the Bates-numbered page(s) of Ex. 1013.

Claim	Lansonic DAS-750
	<p>6); Manual Excerpts (Ex. 1013 at 16) (“Listening to Internet Radio”).</p> <p>The network interface also communicatively couples the device to networked PCs that can serve as the central system. <i>See, e.g.</i> Manual Excerpts (Ex. 1013 at 13); Ex. 1013 at 3 (“Just hook the DAS unit up to your stereo and your LAN, and then after a simple setup process any Windows 95/98/NT/2000 PC will show the DAS-750 unit(s) under their Network Neighborhood icon.”); Configuration (Ex. 1013 at 3); figure showing configuration of networked DAS-750 (Ex. 1013 at 4).</p>
<p>b) a system enabling playback of audio content from a playlist assigned to the electronic device via the central system; and</p>	<p>The DAS-750 enables playback of audio content from playlists. <i>See, e.g.</i>, Manual Excerpts (Ex. 1013 at 16) (“Play a Saved Playlist [-] Spin the dial to highlight the desired playlist, press the dial to select it, then scroll over to the play icon and press the dial to begin play”); Product (Ex. 1013 at 3); Manual Excerpts (Ex. 1013 at 15); Manual Excerpts (Ex. 1013 at 14-16).</p> <p>The playlist can be assigned from a networked PC,” <i>i.e.</i>, via the central system. <i>See, e.g.</i>, Manual Excerpts (Ex. 1013 at 17) (“Save Playlist to the DAS Using the PC”).</p>
<p>c) a control system associated with the network interface and the system enabling playback of the audio content indicated by the playlist, and adapted to:</p>	<p>The DAS-750 includes a control system associated with the network interface and the system enabling playback of audio content indicated by the playlist. <i>See, e.g.</i>, Manual Excerpts (Ex. 1013 at 14-15).</p>
<p>i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a</p>	<p>The DAS-750 allows a user to select from a plurality of modes of operation, including an Internet radio mode of operation and a playlist mode of operation. <i>See</i> claim 1(a) (Internet radio mode of operation) and claim</p>

Claim	Lansonic DAS-750
playlist mode of operation;	1(b) (playlist mode of operation).
ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	The DAS-750 can receive and play an Internet radio broadcast. <i>See</i> claim 1(a).
iii) when the desired mode of operation is the playlist mode of operation: receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	<p>The DAS-750 receives the playlist assigned to it from the central system. <i>See</i> claim 1(b).</p> <p>Songs identified in the playlist can be stored on other networked devices, <i>i.e.</i>, not stored on the device, although the device may have memory for storing songs. <i>See, e.g.</i>, Product (Ex. 1013 at 3) (“[T]he DAS unit can be setup to see and play any shared music file stored on the PC. In fact there’s no need for copying between drives or keeping multiple copies on different machines -- the network connectivity allows any machine (DAS or PC) to access all the music (or other data) regardless of which machine its actually stored on!”); FAQ (Ex. 1013 at 9) (“Similarly music stored on a networked PC can be played on any DAS unit connected to the network.”); Configuration (Ex. 1013 at 2).</p>
receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	<p>The DAS-750 can play songs stored on other networked devices (<i>i.e.</i>, the central system) by selecting a playlist. In order to play the remotely stored songs, the playlist necessarily has information enabling it to obtain the songs from the remote source.</p> <p>Because a playlist can be received from the central system, the information enabling the device to obtain songs from the remote source is received from the central system.</p>
obtain the ones of the plurality of songs from the at least one remote source; and	The DAS-750 can obtain songs stored on other networked devices. To do so, the remotely stored songs are accessed ( <i>i.e.</i> ,

Claim	Lansonic DAS-750
	requested) then transferred across the LAN (i.e., obtained from the remote source). <i>See, e.g.</i> , Configuration (Ex. 1013 at 2) (“The diskless unit is ideal as an additional DAS unit in a multi-room system, where the music is stored in another DAS unit (or PC) with a hard drive and then accessed and played across the LAN.”).
play the audio content indicated by the playlist.	The DAS-750 plays the audio content indicated by the playlist. <i>See</i> claim 1(b).
2. The electronic device of claim 1 wherein the control system is further adapted to enable playback from a broadcast radio source.	The DAS-750 can be connected to receiver/amplifier as illustrated in the connection diagram. A “receiver” receives radio broadcasts. (Ex. 1013 at 4). <i>See also</i> Ex. 1013_2; Ex. 1013 at 5 (“3 stereo analog inputs (RCA) – selectable”).
3. The electronic device of claim 1 wherein the control system is further adapted to enable playback from an optical disc.	The DAS-750 can be connected to a variety of stereo components, including a CD player, and thus is adapted to enable playback from an optical disc. <i>See</i> claim 2.
4. The electronic device of claim 1 further comprising a data storage device, wherein the control system is further adapted to enable playback from the data storage device.	The DAS-750 is capable of playback of content from an included data storage device. <i>See, e.g.</i> , Product (Ex. 1013 at 3) (“In addition to its network capabilities, the LANSONIC™ Digital Audio Server is available with significant internal hard disk storage, allowing music to be centrally stored and organized and then played back, either locally or through the network.”); Specification (Ex. 1013 at 5).
6. The electronic device of claim 1 wherein the control system is further adapted to: display a list of Internet radio broadcast stations.	An Internet radio broadcast can be saved on the DAS-750 as a playlist and playlists can be displayed. Thus the device can display a list of Internet radio broadcast stations. <i>See, e.g.</i> , Manual Excerpts (Ex. 1013 at 16) (“There are 2 ways to listen to internet broadcasts on the DAS Create a Playlist in Winamp 1. Right mouse click in Winamp

Claim	Lansonic DAS-750
	<p>2. Select 'Play Location'  3. Type in the desired internet address  4. Save as a playlist").</p> <p><i>See also</i> Manual Excerpts (Ex. 1013 at 16) ("Play a Saved Playlist").</p>
<p>7. The electronic device of claim 1 further comprising a wireless transceiver communicatively coupled to the control system.</p>	<p>The DAS-750 can include a wireless transceiver. <i>See, e.g.</i>, FAQ (Ex. 1013 at 9) ("A DAS unit can also be connected to wireless Ethernet network using a growing number of wireless LAN products.").</p>
<p>10. The electronic device of claim 1 further comprising at least one speaker.</p>	<p>The DAS-750 can be connected to speakers and a headset. <i>See, e.g.</i>, figure from Ex. 1013 at 4.</p>
<p>21. An electronic device comprising:</p>	
<p>a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively couple the electronic device to a central system;</p>	<p>The DAS-750 includes a network interface coupling it to a central system and enabling it to receive Internet radio. <i>See</i> claim 1(a).</p>
<p>b) a system enabling playback of audio content from a plurality of additional content sources comprising a playlist assigned to the electronic device via the central system; and</p>	<p>The DAS-750 enables playback of audio content from a plurality of sources comprising a playlist assigned to the device. <i>See</i> claim 1(b) and 1(c)(i).</p>
<p>c) a control system associated with the network interface and the system enabling playback of the audio content from the plurality of additional content sources, and adapted to:</p>	<p>The DAS-750 includes a control system. <i>See</i> claim 1(c).</p>
<p>i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet</p>	<p>The DAS-750 allows the user to select from a plurality of modes of operation, each corresponding to a content source. <i>See, e.g.</i>, Product (Ex. 1013 at 3) ("Stereo</p>

Claim	Lansonic DAS-750
radio mode of operation and a plurality of additional modes of operation each corresponding to one of the plurality of additional content sources;	components, such as CD players, tape recorders, and most others can be connected to the network through the DAS unit . . . .”); <i>see also</i> claims 1(c)(i), 2 and 3.
ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	The DAS-750 can receive and play an Internet radio broadcast. <i>See</i> claim 1(c)(ii).
iii) play the audio content from one of the plurality of additional content sources when the desired mode of operation is a corresponding one of the plurality of additional modes of operation, where when in a playlist mode of operation, the control system is further adapted to:	The DAS-750 can play audio content from the additional content sources when in the corresponding mode of operation. <i>See</i> claim 21(c)(i); <i>see also</i> claim 1(c)(i).
receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	The DAS-750 receives from the central system a playlist identifying a plurality of songs, wherein some of the songs may not be stored on the device. <i>See</i> claim 1(c)(iii).
receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	The playlist received from the central system contains information enabling the device to obtain the songs from a remote source. <i>See</i> claim 1(c)(iii).
obtain the ones of the plurality of songs from the at least one remote source; and	The DAS-750 can obtain songs from a remote source. <i>See</i> claim 1(c)(iii).
play the audio content indicated by the playlist.	The DAS-750 plays the audio content indicated by the playlist. <i>See</i> claim 1(c)(iii).
22. The electronic device of claim 21 wherein the plurality of additional content sources further comprises a data storage device of	The DAS-750 can include a data storage device. <i>See</i> claim 4.



Claim	Lansonic DAS-750
the electronic device.	
24. The electronic device of claim 21 wherein the control system is further adapted to: display a list of Internet radio broadcast stations.	The DAS-750 can display a list of Internet radio broadcast stations. <i>See</i> claim 6.
25. The electronic device of claim 21 further comprising a wireless transceiver communicatively coupled to the control system.	The DAS-750 can include a wireless transceiver. <i>See</i> claim 7.
27. The electronic device of claim 21 wherein the system further enables playback from an optical disc.	The DAS-750 enables playback from an optical disc. <i>See</i> claim 3.
28. The electronic device of claim 21 wherein the plurality of additional content sources include a broadcast radio source.	The DAS-750 can play audio content from a broadcast radio source. <i>See</i> claim 2.
29. The electronic device of claim 21 wherein the plurality of additional content sources include an optical disc source.	The DAS-750 can play audio content from an optical disc source. <i>See</i> claim 3.
31. The electronic device of claim 21 further comprising at least one speaker.	The DAS-750 can be connected to speakers and a headset. <i>See</i> claim 10.
42. A method of operation for an electronic device comprising:	
a) enabling a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;	The DAS-750 enables a user to select from a plurality of modes of operation, including Internet radio and playlist modes of operation. <i>See</i> claim 1(c)(i).
b) playing an Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	The DAS-750 can play an Internet radio broadcast. <i>See</i> claim 1(c)(ii).
c) when the desired mode of operation is the playlist mode of	The DAS-750 receives from the central system a playlist identifying a plurality of

Claim	Lansonic DAS-750
operation: i) receiving a playlist assigned to the electronic device via a central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	songs, wherein some of the songs may not be stored on the device. <i>See</i> claim 1(c)(iii).
ii) receiving information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	The playlist received from the central system contains information enabling the device to obtain the songs from a remote source. <i>See</i> claim 1(c)(iii).
iii) obtaining the ones of the plurality of songs from the at least one remote source; and	The DAS-750 can obtain songs from a remote source. <i>See</i> claim 1(c)(iii).
iv) playing audio content indicated by the playlist.	The DAS-750 plays the audio content indicated by the playlist. <i>See</i> claim 1(c)(iii).
43. The method of claim 42 further comprising: a) receiving audio content from a broadcast radio source; and b) playing the audio content from the broadcast radio source.	The DAS-750 can receive and playback audio content from a broadcast radio source. <i>See</i> claim 2.
44. The method of claim 42 further comprising: a) obtaining audio content from an optical disc; and b) playing the audio content from the optical disc.	The DAS-750 can obtain and playback audio content from an optical disc source. <i>See</i> claim 3.
45. The method of claim 42 further comprising: a) obtaining audio content from a data storage device of the electronic device; and b) playing the audio content from the data storage device.	The DAS-750 can obtain and play audio content from a data storage device. <i>See</i> claim 4.
47. The method of claim 42 further comprising displaying a list of Internet radio broadcast stations.	The DAS-750 can display a list of Internet radio broadcast stations. <i>See</i> claim 6.
48. The method of claim 42	The DAS-750 can include a wireless

Claim	Lansonic DAS-750
wherein obtaining the ones of the plurality of songs from the at least one remote source comprises receiving the ones of the plurality of songs from the at least one remote source via a wireless transceiver of the electronic device.	transceiver and can thus obtain songs from a remote source via the wireless transceiver. <i>See</i> claims 1(c) and 7.
52. The method of claim 42 further comprising playing the audio content through at least one speaker.	The DAS-750 can be direct connected to speakers. <i>See</i> claim 10.

**G. Ground 6 – Obviousness Of Claims 1, 2, 3, 4, 6, 7, 8, 10, 21, 22, 24, 25, 26, 27, 28, 29, 31, 42, 43, 44, 45, 47, 48, 49, And 52 In View Of Lansonic DAS-750**

**1. Claims 1, 2, 3, 4, 6, 7, 10, 21, 22, 24, 25, 27, 28, 29, 31, 42, 43, 44, 45, 47, 48, And 52**

It is submitted that the Lansonic webpages constitute a single reference as they were available from the same access point from at least September 18, 2000. However, if it determined for any reason that the pages of the website are not a single reference, each individual section is a publication at least as early as the date indicated for a given section (*i.e.*, September 18, 2000 or earlier for each). As the webpages are all are directed to a single product, it is natural that one of ordinary skill in the art would consider them in their entirety, and it is submitted that the claims identified above would be obvious in view of the combination of references. (Bove Decl. ¶ 25.) The elements of the claims are as identified in the claim charts above.

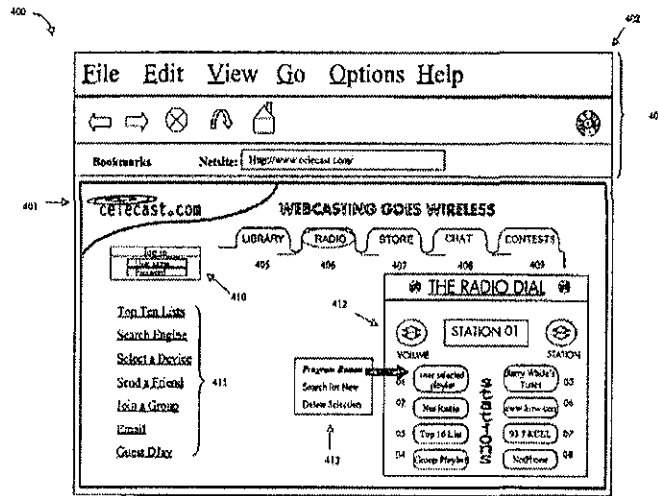
## 2. Claims 8, 26, And 49

Claims 8 and 26 recite that the device is adapted to receive input from a wireless remote control having a navigation shuttle. Claim 49 recites receiving input from a wireless remote control that enables navigating the playlist. The DAS-750 is capable of receiving input from a wireless remote control. *See, e.g.*, Specification (Ex. 1013 at 5) (“Bi-directional IR interface - compatible with many universal remotes.”); Capability (Ex. 1013 at 6) (“Interoperability with common universal IR remotes.”). It would have been obvious to one of skill in the art to enable the DAS-750 to receive input from a remote control having a navigation shuttle to facilitate playlist navigation, as such a function would logically replicate the navigation function of the QuickSpin user dial on the front panel of the device (Ex. 1013 at 14-15). (Bove Decl. ¶ 27.)

### H. Ground 7 – Obviousness Of Claims 1-4, 6, 7, 13, 21, 22, 24, 25, 27, 28, 34, 42-45, 47, And 48 In View Of White

White issued a U.S. application filed on March 28, 2000 and therefore is prior art to the '652 patent under 35 U.S.C. §102(e) based on the earliest effective filing date of the '652 patent, *i.e.*, November 8, 2000. White discloses an electronic device 300 including a wireless communication module 301 to select and play content such as digital audio data. The content can include playlists of songs and internet radio. A web browser which presents a GUI for displaying selectable audio information is illustrated in FIG. 4, reproduced below.

FIG. 4



As discussed at 11:6-12:54, the GUI can be used to select audio information including playlists and Internet broadcasts. The Radio Dial 412 can be provided on the electronic device to facilitate selection of listening material. The selection and playing of playlists is described in connection with FIG. 8 at 15:62-18-45. As part of playlist selection, a user can choose a destination for the playlist, as noted at 16:20-28.

White discloses numerous embodiments including various features. It would have been obvious to one of ordinary skill in the art that the various features as disclosed in White could be implemented in a single device or method as desired. See *Boston Scientific Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982, 991-92 (Fed. Cir. 2009). In *Boston Scientific*, the Federal Circuit found a claim to be obvious in view of a single reference that disclosed “all of the limitations . . . in

two separate embodiments.” *Id.* at 991. In making the obviousness determination, the Federal Circuit observed that “[c]ombining two embodiments disclosed adjacent to each other in a prior art patent does not require a leap of inventiveness.” *Id.* White clearly discloses that the numerous described features may be included in a device depending upon the particular application. (Bove Decl. ¶ 28.) Set forth below is a claim chart that specifies where each element of a challenged claim is met by White.

Claim	U.S. Patent No. 7,187,947 to White <i>et al.</i>
1. An electronic device comprising:	
a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively couple the electronic device to a central system;	<p>Electronic device 300 (FIG. 3) includes network interface 301 having transceiver (8:46-52) and enables receiving Internet radio broadcast. <i>See, e.g.</i>, 5:31-36; 10:20-31; 12:30-33; 17:26-29 (“a user may select an on-line broadcast or radio station . . .”).</p> <p>Interface also allows coupling to central system (Internet website). <i>See, e.g.</i>, FIG. 4; 4:63-5:21; 7:27-40.</p>
b) a system enabling playback of audio content from a playlist assigned to the electronic device via the central system; and	<p>Electronic device 300 plays audio content from a playlist. <i>See, e.g.</i>, FIG. 4 (playlists in Radio dial 412); 9:15-57; 10:20-42; 12:29-35; FIG. 8 (execute playlist); 17:7-18.</p> <p>Playlists can be assigned to selected device via website. <i>See, e.g.</i>, FIG. 4 (411, “Select a Device”); 11:66-12:7; FIG. 8 (804, “User prompted for destination device”); 15:62-16:28; 17:32-55.</p>
c) a control system associated with the network interface and the system enabling playback of the audio content indicated by the	<p>Electronic device 300 includes a control system. <i>See, e.g.</i>, FIG. 3, processor module 302; 8:46-64; FIG. 4, radio dial 412 may be provided on electronic device; 12:38-54.</p>

Claim	U.S. Patent No. 7,187,947 to White <i>et al.</i>
playlist, and adapted to:	
i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;	Radio dial 412 allows selection of Internet radio mode and playlist mode ( <i>e.g.</i> , user selected playlist, Net Radio, 93.7 KCEL). <i>See, e.g.</i> , 16:3-6; 17:26-28 (internet radio); 16:6-19 (playlists).
ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	Internet radio will be played when selected from radio dial 412 on electronic device. <i>See</i> claim 1(a).
iii) when the desired mode of operation is the playlist mode of operation: receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	Playlist is received from central system (web site). <i>See, e.g.</i> , FIG. 8, 813, 807, 808. Playlist identifies plural songs. <i>See, e.g.</i> , 16:3-4.  Ones of the songs are not stored on the device, but may be accessed via Internet and other sources. <i>See, e.g.</i> , 5:3-21; 7:27-66; 16:11-19 (“In this manner, desirable audio information may be obtained from many different sources such as URLs, network addresses, hard drives, databases comprised of audio information, etc.”).
receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	Web site provides playlist with information such as URLs that enables device to obtain songs. <i>See, e.g.</i> , 16:12-19 (“Upon creating a playlist, the method may proceed to step 803 where information associated with the playlist is obtained. For example, a list of network or URL locations comprised of the desirable audio information may be obtained. In this manner, desirable audio information may be obtained from many different sources such as URLs, network addresses, hard drives, databases comprised of audio information, etc. The sources may be accessed to obtain the selected audio information.”).

Claim	U.S. Patent No. 7,187,947 to White <i>et al.</i>
obtain the ones of the plurality of songs from the at least one remote source; and	When playlist is executed songs will be obtained. <i>See, e.g.</i> , FIG. 8; 16:35-16:18.
play the audio content indicated by the playlist.	When playlist is executed songs will be played. <i>See, e.g.</i> , FIG. 8; 16:35-16:18.
2. The electronic device of claim 1 wherein the control system is further adapted to enable playback from a broadcast radio source.	Electronic device may include a radio receiver. <i>See, e.g.</i> , 9:53-57.10:32-42; 13:4-29.
3. The electronic device of claim 1 wherein the control system is further adapted to enable playback from an optical disc.	Audio content may be played from an optical disc. <i>See, e.g.</i> , 18:46-50; 5:31-36.
4. The electronic device of claim 1 further comprising a data storage device, wherein the control system is further adapted to enable playback from the data storage device.	Electronic device includes a data storage device. <i>See, e.g.</i> , 8:46-52; 8:67-9:5; 13:18-26.
6. The electronic device of claim 1 wherein the control system is further adapted to: display a list of Internet radio broadcast stations.	Radio dial 412 displays list including Internet Radio. <i>See, e.g.</i> , FIG. 4; 12:30-37.
7. The electronic device of claim 1 further comprising a wireless transceiver communicatively coupled to the control system.	Communication module 301 is wireless transceiver. <i>See, e.g.</i> , 9:6-14.
13. The electronic device of claim 1 wherein the control system is further adapted to: receive and display a recommended song.	User may select songs based upon various search criteria and the playlist will thus contain recommended songs corresponding to the criteria. Songs are displayed. <i>See, e.g.</i> , 17:56-18:19; 15:62-16:6.
21. An electronic device comprising:	
a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively	<i>See claim 1(a).</i>



Claim	U.S. Patent No. 7,187,947 to White <i>et al.</i>
couple the electronic device to a central system;	
b) a system enabling playback of audio content from a plurality of additional content sources comprising a playlist assigned to the electronic device via the central system; and	<i>See claim 1(b).</i>
c) a control system associated with the network interface and the system enabling playback of the audio content from the plurality of additional content sources, and adapted to:	<i>See Claim 1(c).</i>
i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a plurality of additional modes of operation each corresponding to one of the plurality of additional content sources;	<i>See claims 1(c)(i), 2, and 3. Additional sources may include playlists and radio receiver in addition to playlists. See, e.g., 9:53-57.</i>
ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	<i>See claim 1(c)(ii).</i>
iii) play the audio content from one of the plurality of additional content sources when the desired mode of operation is a corresponding one of the plurality of additional modes of operation, where when in a playlist mode of operation, the control system is further adapted to:	<i>See claim 1(c)(i) and (ii).</i>
receive the playlist assigned to the electronic device from the central	<i>See claim 1(c)(iii).</i>

Claim	U.S. Patent No. 7,187,947 to White <i>et al.</i>
system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	
receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	<i>See claim 1(c)(iii).</i>
obtain the ones of the plurality of songs from the at least one remote source; and	<i>See claim 1(c)(iii).</i>
play the audio content indicated by the playlist.	<i>See claim 1(c)(iii).</i>
22. The electronic device of claim 21 wherein the plurality of additional content sources further comprises a data storage device of the electronic device.	<i>See claim 4.</i>
24. The electronic device of claim 21 wherein the control system is further adapted to: display a list of Internet radio broadcast stations.	<i>See claim 6.</i>
25. The electronic device of claim 21 further comprising a wireless transceiver communicatively coupled to the control system.	<i>See claim 7.</i>
27. The electronic device of claim 21 wherein the system further enables playback from an optical disc.	<i>See claim 3.</i>
28. The electronic device of claim 21 wherein the plurality of additional content sources include a broadcast radio source.	<i>See claim 2.</i>
34. The electronic device of claim 21 wherein the control system is further adapted to: receive and	<i>See claim 13.</i>

Claim	U.S. Patent No. 7,187,947 to White <i>et al.</i>
display a recommended song.	
42. A method of operation for an electronic device comprising:	
a) enabling a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;	<i>See claim 1(c)(i).</i>
b) playing an Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and	<i>See claim 1(c)(ii).</i>
c) when the desired mode of operation is the playlist mode of operation: i) receiving a playlist assigned to the electronic device via a central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;	<i>See claim 1(c)(iii).</i>
ii) receiving information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;	<i>See claim 1(c)(iii).</i>
iii) obtaining the ones of the plurality of songs from the at least one remote source; and	<i>See claim 1(c)(iii).</i>
iv) playing audio content indicated by the playlist.	<i>See claim 1(c)(iii).</i>
43. The method of claim 42 further comprising: a) receiving audio content from a broadcast radio source; and b) playing the audio content from the broadcast radio source.	<i>See claim 2.</i>

Claim	U.S. Patent No. 7,187,947 to White <i>et al.</i>
<p>44. The method of claim 42 further comprising:  a) obtaining audio content from an optical disc; and  b) playing the audio content from the optical disc.</p>	<p><i>See claim 3.</i></p>
<p>45. The method of claim 42 further comprising:  obtaining audio content from a data storage device of the electronic device; and  playing the audio content from the data storage device.</p>	<p><i>See claim 4.</i></p>
<p>47. The method of claim 42 further comprising displaying a list of Internet radio broadcast stations.</p>	<p><i>See claim 6.</i></p>
<p>48. The method of claim 42 wherein obtaining the ones of the plurality of songs from the at least one remote source comprises receiving the ones of the plurality of songs from the at least one remote source via a wireless transceiver of the electronic device.</p>	<p><i>See claim 7.</i></p>

## VIII. CONCLUSION

For the reasons detailed above, there is a reasonable likelihood that Petitioner will prevail as to each of claims 1-4, 6-8, 10, 11, 13, 14, 21, 22, 24-29, 31, 32, 34, 35, 42-45, 47-50, 52, 53, 55, and 56 of the '652 patent. Accordingly, *inter partes* review of claims 1-4, 6-8, 10, 11, 13, 14, 21, 22, 24-29, 31, 32, 34, 35, 42-45, 47-50, 52, 53, 55, and 56 of the '652 patent is respectfully requested.

The USPTO is authorized to charge any required fees, including the fee as set forth in 37 C.F.R. § 42.15(a) and any excess claim fees, to Deposit Account No. 03-1952 referencing Docket No. 393032805800.

Dated: September 18, 2013

Respectfully submitted,

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**Certificate of Service (37 C.F.R. § 42.6(e)(4))**

I hereby certify that the attached Petition for *Inter Partes* Review and supporting materials were served as of the below date by U.S. Express Mail on the Patent Owner at the correspondence address indicated for U.S. Patent No. 8,050,652:

Concert Technology Corporation  
5400 Trinity Road, Suite 303  
Raleigh, NC 27607

Dated: September 18, 2013

/Mehran Arjomand/  
Mehran Arjomand  
MORRISON & FOERSTER LLP  
707 Wilshire Blvd, Suite 6000  
Los Angeles, CA 90017-3543

# **EXHIBIT 9**

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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YAMAHA CORPORATION OF AMERICA  
Petitioner

v.

BLACK HILLS MEDIA, LLC  
Patent Owner

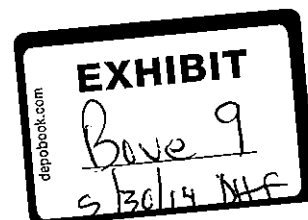
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Case IPR2013-00594  
Patent 8,050,652 B2

Before BRIAN J. McNAMARA, STACEY G. WHITE, and  
PETER P. CHEN, *Administrative Patent Judges*.

WHITE, *Administrative Patent Judge*.

DECISION  
Institution of *Inter Partes* Review  
37 C.F.R. § 42.108





I. INTRODUCTION

A. Background

Yamaha Corporation of America (“Petitioner”) filed a petition to institute an *inter partes* review of claims 1-4, 6-8, 10, 11, 13, 14, 21, 22, 24-29, 31, 32, 34, 35, 42-45, 47-50, 52, 53, 55, and 56 (“challenged claims”) of U.S. Patent No. 8,050,652 B2 (Ex. 1001, the “652 Patent”) pursuant to 35 U.S.C. §§ 311-319. Paper 1 (“Pet.”). Black Hills Media, LLC (“Patent Owner”) filed a preliminary response. Paper 10 (“Prelim. Resp.”). We have jurisdiction under 35 U.S.C. § 314.

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides as follows:

THRESHOLD – The Director may not authorize an *inter partes* review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

Petitioner contends the challenged claims are unpatentable under 35 U.S.C. §§ 102 and 103 on the following specific grounds (Pet. 12-14):

Reference(s)	Basis	Claims challenged
Leeke <sup>1</sup>	§102 §103	1, 2, 4, 6, 7, 10, 11, 13, 14, 21, 22, 24, 25, 28, 31, 32, 34, 35, 42, 43, 45, 47, 48, 52, 53, 55, and 56
Qureshey <sup>2</sup> and Berman <sup>3</sup>	§103	1-4, 6-8, 10, 13, 21, 22, 24-29, 31, 42-45, 47-50, and 52

<sup>1</sup> U.S. Patent No. 6,587,127 B1, July 1, 2003, filed Nov. 24, 1998 (Ex. 1010).

<sup>2</sup> WO 99/38266, published July 29, 1999 (Ex. 1011).

Reference(s)	Basis	Claims challenged
Qureshey, Berman, and Leeke	§103	11, 32, and 53
Lansonic DAS-750 <sup>4</sup>	§102	1-4, 6, 7, 10, 21, 22, 24, 25, 27-29, 31, 42-45, 47, 48, and 52
Lansonic DAS-750	§103	1-4, 6-8, 10, 21, 22, 24-29, 31, 42-45, 47-49, and 52
White <sup>5</sup>	§103	1-4, 6, 7, 13, 21, 22, 24, 25, 27, 28, 34, 42-45, 47, and 48

For the reasons described below, we determine that the present record demonstrates a reasonable likelihood that Petitioner will prevail in establishing the unpatentability of all but four of the challenged claims. Accordingly, we grant the Petition for *inter partes* review of the '652 Patent as to claims 1-4, 6-8, 10, 11, 13, 21, 22, 24-29, 31, 32, 34, 42-45, 47-50, 52, and 53 based on the authorized grounds, as discussed below. We deny the Petition as to claims 14, 35, 55, and 56.

*B. Related Matters*

Petitioner indicates that the '652 Patent is at issue in *Black Hills Media, LLC v. Yamaha Corp. of America*, No. 2:13-cv-006054 (C.D. Cal.) Pet. 2-4. In addition, Patent Owner also has pending cases concerning the '652 Patent in the United States District Court for the District of Delaware involving Sharp (1:13-cv-00804), Toshiba (1:13-cv-00805), Panasonic (1:13-cv-00806) and LG Electronics Inc. (1:13-cv-00803-RGA); a case in the Eastern District of Texas against Samsung (2:13-cv-00379); cases in the

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<sup>3</sup> U.S. Patent No. 6,502,194 B1, Dec. 31, 2002, filed Apr. 16, 1999 (Ex. 1012).

<sup>4</sup> Web pages describing the Lansonic DAS-750 (Ex. 1013).

<sup>5</sup> U.S. Patent No. 7,187,947 B1, Mar. 6, 2007, filed Mar. 28, 2000 (Ex. 1014).

IPR2013-00594  
Patent 8,050,652 B2

Central District of California involving Pioneer (2:13-cv-05980), Logitech International (2:13-cv-06055), and Sonos, Inc. (2:13-cv-06062); and an investigation before the U.S. International Trade Commission, *Certain Digital Media Devices, Including Televisions, Blu-Ray Disc Players, Home Theater Systems, Tablets and Mobile Phones, Components Thereof and Associated Software*, Inv. No. 337-TA-882 (USITC). Pet. 3-4; Mandatory Notice (Paper 5) 1-2. Also, U.S. Patent No. 8,045,952 B2 is related to the '652 Patent and is the subject of a separate petition for *inter partes* review, which currently is pending before the Board.<sup>6</sup> Pet. 2-3.

*C. Real Party-in-Interest*

Patent Owner alleges that Petitioner fails to identify all real parties-in-interest and thus, the Petition should be dismissed for noncompliance with 35 U.S.C. § 312(a) and 37 C.F.R. § 42.8(b)(1). Prelim. Resp. 2, 6. Patent Owner asserts that Pioneer Corporation and Pioneer Electronics (USA) Inc. (collectively "Pioneer") should have been identified in the Petition as real parties-in-interest. *Id.* at 3. Patent Owner and Pioneer currently are engaged in a patent infringement lawsuit in parallel with the patent infringement lawsuit between Patent Owner and Petitioner. *Id.* AV receivers, networked Blu-Ray players, and home theater systems from Pioneer and Petitioner are alleged to infringe claim 1 of the '652 Patent. *Id.* Thus, according to Patent Owner, Pioneer and Petitioner are aligned with respect to claim construction and invalidity of the claims asserted in the district court litigation. *Id.* at 3-4. Patent Owner also argues that Petitioner's counsel in this proceeding has spoken on behalf of Petitioner and Pioneer at a district court technology

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<sup>6</sup> Case IPR2013-00593.

IPR2013-00594  
Patent 8,050,652 B2

tutorial directed to the '652 Patent. *Id.* at 4. Finally, Patent Owner states that Pioneer's counsel agreed to be bound by the outcome of this proceeding if the district court would agree to stay the district court litigation. *Id.* at 4-5; Ex. 2008.

We are not persuaded that Pioneer is a real party-in-interest in this matter. A determination as to whether a non-party to an *inter partes* review is a real party-in-interest is a "highly fact-dependent question," based on factors such as whether the non-party "exercised or could have exercised control over a party's participation in a proceeding" and the degree to which a non-party funds, directs, and controls the proceeding. Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,759-60 (Aug. 14, 2012). In other words, the question before us is whether there is a non-party "at whose behest the petition has been filed" or a relationship "sufficient to justify applying conventional principles of estoppel and preclusion." *Id.* at 48,759.

On the record currently before us, we are not persuaded that Pioneer is in position to exercise control over Petitioner's involvement in this proceeding. It is common for one lawyer to speak on behalf of multiple parties at a technology tutorial. Often, this is done for efficiency purposes and by itself does not signify control over the various entities in the lawsuit. In addition, while Pioneer and Petitioner both may be interested in the patentability of the '652 Patent claims, this does not mean that the parties have the same interests. Litigation alliances may arise for numerous reasons, including, but not limited to, parties having a similar perspective on one or more issues in a case. The existence of such alliances alone generally does not rise to the level that would require naming the ally/co-defendant as a real party in interest. Office Patent Trial Practice Guide, 77 Fed. Reg.

48,760 (Aug. 14, 2012). We, therefore, will not deny the Petition for failure to comply with 35 U.S.C. § 312(a) and 37 C.F.R. § 42.8(b)(1).

*D. The '652 Patent*<sup>7</sup> (Ex. 1001)

The '652 Patent is directed to methods and apparatuses that allow users to receive and play audio from various sources and to assign playlists over a network to a network-enabled audio device. Ex. 1001, Abstract. The specification lists several problems with prior art systems such as the cost and technical complexity associated with listening to streaming audio over the Internet and playing songs on a PC. *Id.* at 1:52-2:12. The invention of the '652 Patent was intended to alleviate such issues “by providing a network-enabled audio device for listening to a variety of audio sources with substantially equal convenience.” *Id.* at 2:15-19.

In Internet radio mode, the inventive device receives and plays a broadcast from an Internet radio station. *Id.* at 10:3-12, 10:49-57. The inventive device also may work in conjunction with a computer. *Id.* at 16:32-35. In that embodiment, software may be used to assign a playlist of songs to a network-enabled audio device. *Id.* This embodiment is illustrated in Figures 15 and 19B of the '652 Patent. Figure 15 is reproduced below:

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<sup>7</sup> The '652 Patent shares a specification with the '952 Patent, which is the subject of a separate petition for inter partes review that currently is pending before the Board. *See* IPR2013-00593.

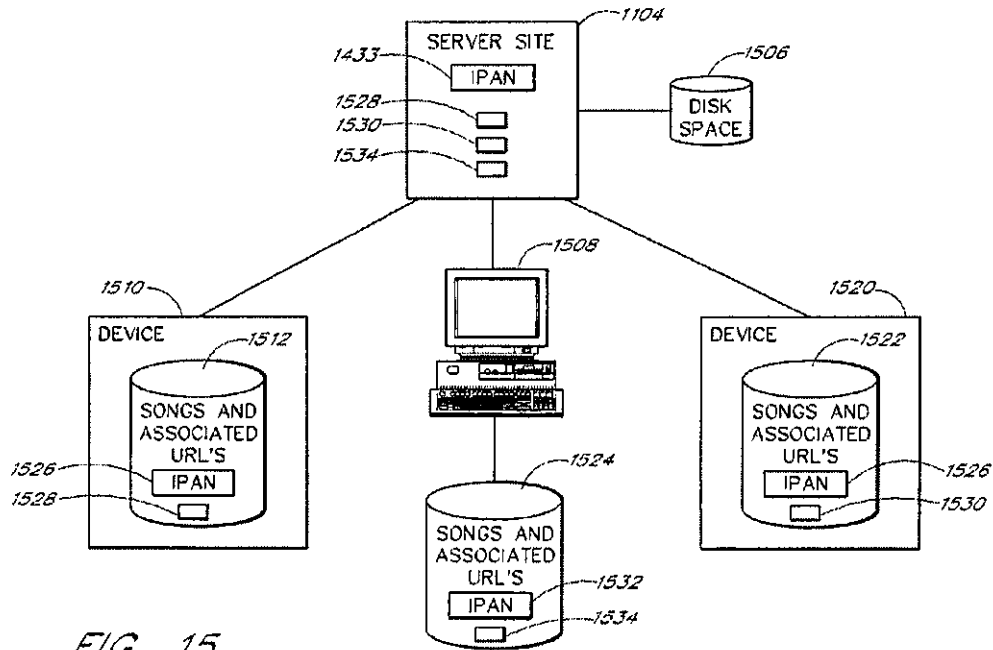


FIG. 15

Figure 15 is a block diagram illustrating the configuration between network-enabled audio devices and a stereo web site. Ex. 1001, 6:4-6. Figure 15 illustrates two network-enabled audio devices (1510 and 1520) connected to Internet Personal Audio Network (“IPAN”) server site 1104. *Id.* at 21:40-43. Storage spaces (1512 and 1522) of network-enabled audio devices (1510 and 1520) are used to store IPAN software 1526, playlist (1528 or 1530), and associated URLs and songs within the playlist. *Id.* at 21:43-57. Server site 1104 includes IPAN software 1433 and playlists (1528 and 1530). *Id.* at 21:52-57.

Figure 19B of the '652 Patent is reproduced below:

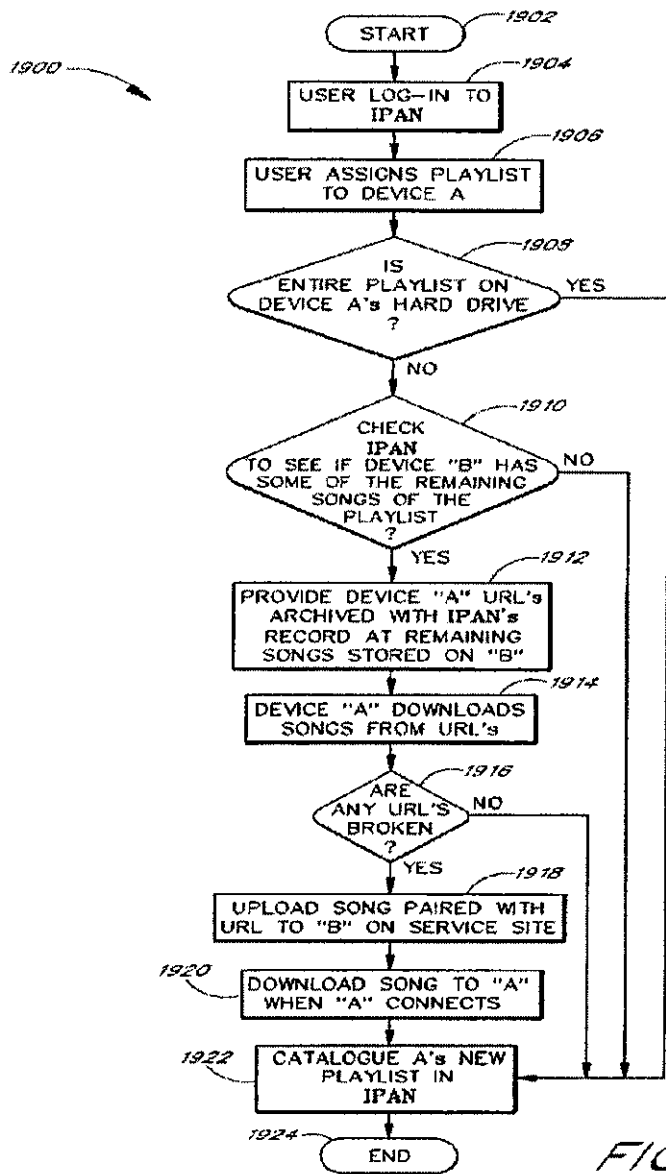


FIG. 19B

Figure 19B shows the process for assigning a playlist to a device. Ex. 1001, 6:60-61. At step 1908, a user assigns a playlist to first device 1510. *Id.* at 28:14-16. The system then determines whether all of the songs on the playlist are stored on the hard drive of first device 1510. *Id.* at 28:20-22. If any of the songs are missing from first device 1510, IPAN 1433 forms a list of remaining songs and checks the hard drive of second device 1520 to

determine whether any of the remaining songs may be found on that device. *Id.* at 28:24-30. If any of the songs is found on second device 1520, then IPAN 1433 will provide first device 1510 with URLs for those songs, and first device 1510 will attempt to download the songs from second device 1520. *Id.* at 28:30-40.

*E. Illustrative Claim*

Claim 1 of the '652 Patent is illustrative of the claims at issue:

1. An electronic device comprising:

- a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively couple the electronic device to a central system;
- b) a system enabling playback of audio content from a playlist assigned to the electronic device via the central system; and
- c) a control system associated with the network interface and the system enabling playback of the audio content indicated by the playlist, and adapted to:
  - i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;
  - ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and
  - iii) when the desired mode of operation is the playlist mode of operation:



receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;

receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;

obtain the ones of the plurality of songs from the at least one remote source; and

play the audio content indicated by the playlist.

*F. Claim Interpretation*

We must determine the meaning of the claims before we analyze the proposed grounds of unpatentability. Consistent with the statute and legislative history of the America Invents Act<sup>8</sup>, we interpret claims of an unexpired patent using the broadest reasonable construction consistent with the patent specification. 37 C.F.R. § 42.100(b); *see also* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Under the broadest reasonable construction standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). Petitioner seeks construction of the following terms: (1) “playlist assigned to the electronic device” and (2) “wherein ones of the plurality of songs are not stored on the

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<sup>8</sup> Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”).

electronic device.” Pet. 7-13. Patent Owner responds to Petitioner’s proposed constructions and proposes a construction for the term “playlist.” Prelim. Resp. 17-20.

1. *“Playlist”/“Playlist Assigned to the Electronic Device”*

Independent claims 1, 21, and 42 each recite the term “playlist assigned to the electronic device.” Petitioner asserts that the term should be construed as “a list of songs that is to be transferred to a particular device selected by the user.” Pet. 8-9 (citing Ex. 1002 ¶¶ 12-14.). Patent Owner argues that “playlist” should be construed separately and its construction should be “a list referencing media items arranged to be played in a sequence.” Prelim. Resp. 17. In addition, Patent Owner asserts that “assigned to the electronic device” requires no further construction, but if the Board decides that a construction is necessary Patent Owner proposes that the proper construction is “directed to the electronic device.” *Id.* at 19.

The specification of the ’652 Patent defines “playlist 1528 . . . [as] a list of audio files and associated URLs of where the audio files were retrieved from.” Ex. 1001, 21:63-65. Patent Owner argues that the term also includes a requirement that the playlist be “arranged to be played in a sequence.” Prelim. Resp. 17-18 (citing Ex. 1001, 24:31-43). In support of this argument Patent Owner cites the discussion of Figure. 17B. *Id.* This portion of the specification discusses audio player window 1792, which includes shuffle button 1796 and repeat button 1798. Ex. 1001, 24:31-43. These buttons may be used to vary the order of songs to be played and to play repeatedly songs indicated by the playlist. *Id.* On the current record, we are not persuaded that this description of audio player window 1792

narrows the previously cited definition of a playlist. In addition, we note that the claims require that the system be able to play the “audio content from a playlist.” *Id.* at 34:11-12; *see also id.* at 35:38-41 (reciting a commensurate limitation) and 37:21 (reciting playback of “audio content indicated by the playlist.”). Thus, the claims require the system to play content from the playlist as opposed to playing the playlist itself. Therefore, on the record currently before us, we construe playlist to mean “a list of audio files or URLs of where the audio files were retrieved from.”

The parties also dispute whether the playlist must be transferred to a device or directed to a device. The specification describes an embodiment that does not have storage space for a playlist. Ex. 1001, 4:4-9. In this embodiment the playlist is stored on the IPAN Manager or a PC. *Id.* Petitioner’s expert, Dr. Bove opines that in this embodiment the playlist is not assigned to the device. Ex. 1002 ¶ 17. We, however, are not persuaded by his statement. The ’652 Patent specifically contemplates a scenario where the playlist is resident on one device and used by another device to play songs. On the current record, we are not persuaded that this term should be narrowed to exclude this embodiment. Thus, based on the record currently before us, we agree with Patent Owner’s proposal that the playlist is “directed to” rather than “transferred to” a device.

Finally, the parties dispute whether a user is required to select the device. The specification repeatedly describes assignment of a playlist to a particular device selected by a user. *See e.g.*, Ex. 1001, 4:57-58, 22:39-40, 24:45-48, 28:16, Fig.19B, and Fig. 19C<sub>1</sub>; *see also* Ex. 1002 ¶ 14 (noting that assignments are made to user selected devices). Patent Owner asserts that Petitioner is attempting to read an embodiment from the specification into

the claim limitations and to exclude other embodiments. Prelim. Resp. 18. Patent Owner cites a portion of the specification discussing Figure 17E as an example of an embodiment excluded by Petitioner's proposed construction. *Id.* (quoting Ex. 1001, 25:3-8). Figure 17E illustrates the screen presented to a user in order to schedule a particular time or day to play a playlist. Ex. 1001, Fig. 17E. It shows the name of the playlist ("Favorites") and it also has a drop down box allowing the user to select the particular device to play this playlist. *Id.* Thus, even in this embodiment the user selects the particular device. Therefore, on the record currently before us, we construe "playlist assigned to the electronic device" to mean "a list of audio files or URLs of where the audio files were retrieved from directed to a particular device selected by a user."

2. *"Wherein Ones of the Plurality of Songs Are Not Stored on the Electronic Device"*

Petitioner proposes that the plain meaning of "wherein ones of the plurality of songs are not stored on the electronic device" implies that the electronic device be capable of storing songs. Pet. 9. According to Petitioner, this term would have no meaning if no songs could be stored on the device. *Id.* Patent Owner asserts that this proposal "is both illogical and contrary to the teachings of the [']652 Patent." Prelim. Resp. 19. As an alternative, Patent Owner proposes that the disputed term mean "wherein *at least one* of the plurality of songs is not stored on the electronic device." *Id.* at 20. Independent claims 1, 21, and 42 each recite the disputed language and each of these claims have dependent claims that recite electronic devices that playback songs from data storage devices or optical disks. Ex. 1001, 34:39-45, 36:18-19, 37:27-33. In addition, as both parties acknowledge, the

specification describes an embodiment that does not have storage for songs. *See* Prelim. Resp. 19, Pet. 10 (citing Ex. 1001, 3:57-4:9); *see also* Ex. 1001, 4:5-9 (“This embodiment provides for a low-cost system that can play songs from playlists stored on the IPAN Manager or on the PC’s storage space without having to store the audio files locally.”). Thus, on the record currently before us, we are persuaded that the broadest reasonable interpretation of the disputed language in light of the specification is “wherein at least one of the plurality of songs is not stored on the electronic device.”

### 3. *Remaining Claim Terms*

All other terms in the challenged claims are given their ordinary and customary meaning and need no express construction at this time.

## II. ANALYSIS

We turn now to Petitioner’s asserted grounds of unpatentability and Patent Owner’s arguments in its Preliminary Response to determine whether Petitioner has met the threshold standard of 35 U.S.C. § 314(a).

### A. *Asserted Obviousness Ground Based on White (Ex. 1014)*

#### 1. *Overview of White*

White is directed to a system and method for communicating selected information to an electronic device. Ex. 1014 ¶ Abstract. Selected information includes “audio information such as songs, on-line radio stations, on-line broadcasts, streaming audio, or other selectable information.” *Id.* at 3:59-61. White discloses “allow[ing] a radio listener to

create a personal playlist and to listen to this playlist in a wireless atmosphere while enjoying CD quality sound.” *Id.* at 2:7-10.

White’s Figure 4 is reproduced below:

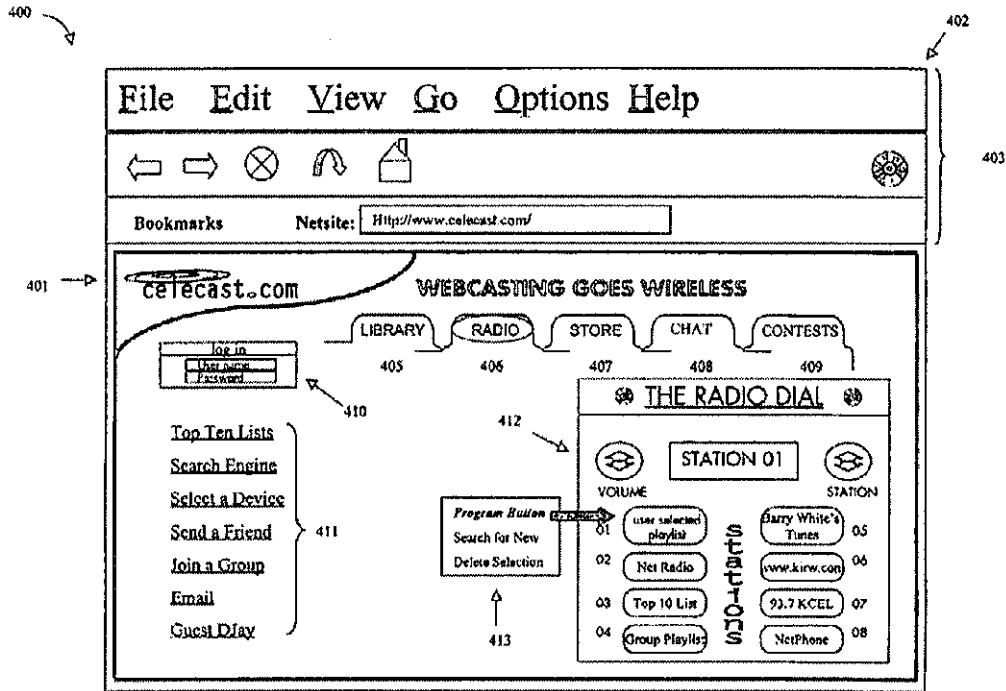


Figure 4 shows graphical user interface 400 for displaying selectable audio information. *Id.* at 11:6-15. Interface 400 may be displayed as a web page. *Id.* This interface allows users to view radio dial 412 or “a current playlist selected by the user or the status of [a] wirelessly communicated playlist.” Ex. 1014, 11:26-33. Programming interface 413 is used to specify items to be displayed by radio dial 412. *Id.* at 12:29-30. These items may include Internet and broadcast radio stations or playlists. *Id.* at 12:30-36.

Figure 8 is reproduced below:

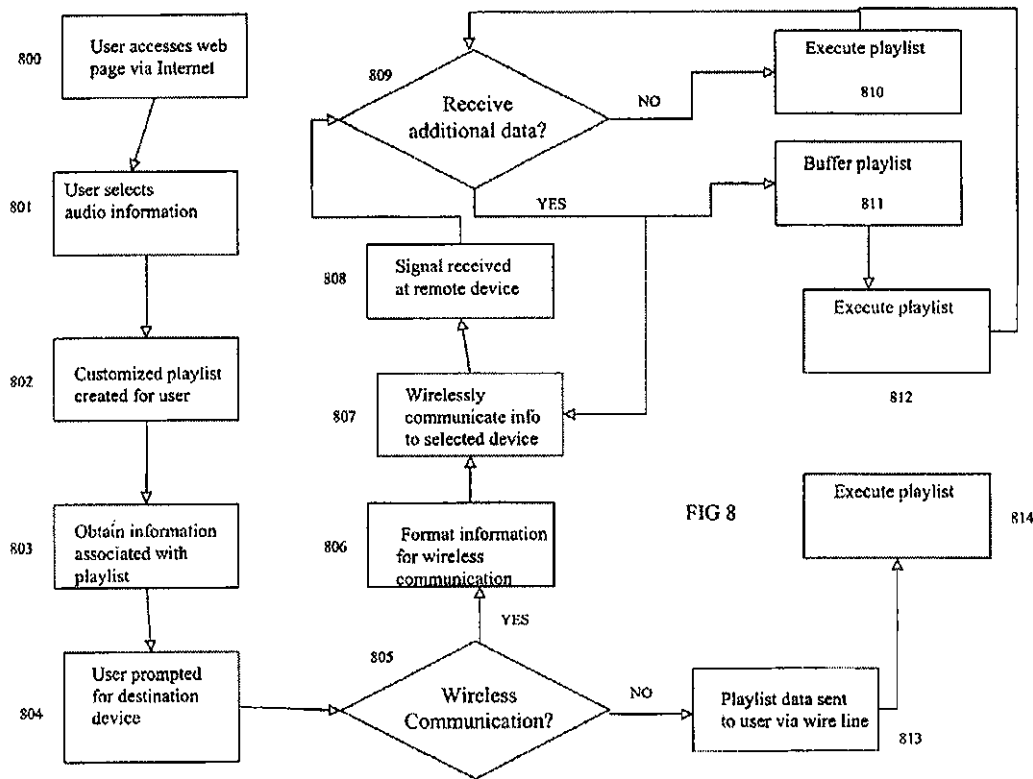


Figure 8 depicts a method for providing selected audio information to an electronic device. Ex. 1014, 3:40-42. At step 800, the user accesses a web page such as the home page shown in Figure 4. *Id.* at 15:64-67. Then at step 801, the user selects “a single song, a plurality [of] different songs, an entire album, a broadcast station, streaming audio, etc. or other selectable audio information.” *Id.* at 16:3-6. A playlist is created at step 802 reflecting the user’s audio selections. *Id.* at 16:6-9. In certain embodiments, the playlist may be composed of songs selected by a friend or group of friends. *Id.* at 17:56-18:19. A list of information is compiled at step 803 including information associated with the playlist, such as network or URL locations for the selected audio information. *Id.* at 16:12-14. At step 804, the user then selects a device such as “a[n] automobile audio system, a home stereo system, a home computer, an electronic device coupled to a home network

or computer system, etc.[,] or other locations or devices operable to receive the selected audio information.” Ex. 1014, 16:24-28. The playlist and associated information are communicated to the electronic device via a wired or wireless connection. *Id.* at 16:35-45. Once the information is communicated to the electronic device, the user may execute the playlist. *Id.* at 17:7-18.

White’s electronic device “may be integrated into an audio component such as a radio receiver” or “coupled to a home audio system, a portable radio system or other system thereby providing a versatile electronic device operable to receive wirelessly communicated selected audio information.” *Id.* at 9:53-57, 10:38-42. In certain embodiments, White’s electronic device may be coupled to an optical disc player such as a CD player or “storage medium 303 such as a high speed buffer, programmable memory, or other devices operable to store information.” *Id.* at 18:46-50, 8:46-52; 8:67-9:5.

## 2. *Analysis of Asserted Ground of Obviousness over White*

Petitioner contends that White would have rendered obvious claims 1-4, 6, 7, 13, 21, 22, 24, 25, 27, 28, 34, 42-45, 47, and 48 of the ’652 Patent. Pet. 51-59. Petitioner relies on claim charts and the Declaration of Dr. V. Michael Bove, Jr. to show how this reference allegedly teaches or suggests the claimed subject matter. *Id.*; Ex. 1002.

### a) Independent Claim 1

Independent claim 1, in part, recites a control system adapted to receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs,



wherein ones of the plurality of songs are not stored on the electronic device.

Petitioner argues that White teaches a playlist created from user selections that is transmitted to an electronic device selected by the user. Pet. 53 (citing Ex. 1014, Figs. 4 and 8, 11:66-12-7, 15:62-16-28). Petitioner further asserts that the playlist may contain one or more songs. *Id.* at 54 (citing Ex. 1014, 16:3-4). In addition, Petitioner maintains that one or more of those songs “may be obtained from many different sources such as URLs, network addresses, hard drives, databases comprised of audio information, etc.” *Id.* (quoting Ex. 1014, 16:11-19). Claim 1, in part, further recites a control system adapted to

receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source.

Petitioner argues that White teaches a web site that provides URLs to the electronic device that are associated with the songs on the playlist. *Id.* (citing Ex. 1014, 16:12-19).

Patent Owner<sup>9</sup> argues that White acquires information associated with the playlist prior to the user assigning the playlist to a device. Prelim. Resp. 45 (citing Ex. 1014, 16:20-22, 16:35-37). Thus, the URLs referred to in “White cannot represent information received by the device (103) that enables the device (103) to obtain songs, because these URLs are utilized to

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<sup>9</sup> We note that Patent Owner states that White does not “anticipate” the ’652 Patent claims under 35 U.S.C. § 102(e). Prelim. Resp. 43-47. Petitioner, however, argues that White is available as prior art under 35 U.S.C. § 102(e) and that it would have rendered the ’652 Patent claims obvious under 35 U.S.C. § 103. Pet. 51. We analyze Patent Owner’s arguments concerning White as opposing Petitioner’s asserted ground of obviousness.

obtain the songs from a remote source prior to the device (103) even being selected.” *Id.* at 46-47.

We are not persuaded by Patent Owner’s arguments. “[A]s a general rule the claim is not limited to performance of the steps in the order recited, unless the claim explicitly or implicitly requires a specific order.” *Baldwin Graphic Sys, Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1345 (Fed. Cir. 2008) (citing *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1342-43 (Fed. Cir. 2001)). This is particularly true here because claim 1 recites an electronic device and not a method. Claim 1 recites, in relevant part, an apparatus with a control system adapted (1) to receive the assigned playlist and (2) to receive information enabling the device to obtain songs not stored on the device. On this record, we are not persuaded that claim 1 requires the recited apparatus to be adapted to receive these items in a specific order. Petitioner, on the record currently before us, has persuaded us that White teaches a device adapted to receive a playlist and to receive URLs that may be used to obtain songs not resident in the device’s memory. Thus, Petitioner has shown sufficiently that White teaches this limitation.

As to the remaining limitations of claim 1, we have reviewed Petitioner’s supporting evidence and determine that Petitioner has met the threshold standard of 35 U.S.C § 314(a). On this record, we are persuaded that there is a reasonable likelihood that Petitioner will prevail in showing that claim 1 would have been rendered obvious by White.

b) Independent Claims 21 and 42

Independent claims 21 and 42 recite limitations similar to those of claim 1 and, therefore, we are persuaded that there is a reasonable likelihood

that Petitioner will prevail in showing that claims 21 and 42 would have been rendered obvious by White. For example, claim 42 is a method claim that recites, in relevant part:

i) receiving a playlist assigned to the electronic device via a central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;

ii) receiving information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;

On the record currently before us, we are not persuaded that the steps of this method claim are required to be performed in a specific order. Thus, for reasons stated above, we are persuaded that White teaches these limitations. On this record, we are persuaded by Petitioner's assertion that there is a reasonable likelihood that it will prevail in showing that claims 21 and 42 would have been rendered obvious by White.

c) Dependent Claims

With respect to the remaining dependent claims 2-4, 6, 7, 13, 22, 24, 25, 27, 28, 34, 43-45, 47, and 48, we have reviewed Petitioner's supporting evidence and determine that Petitioner has met the threshold standard of 35 U.S.C § 314(a). For example, claim 2 depends from claim 1 and recites "wherein the control system is further adapted to enable playback from a broadcast radio source." Petitioner argues that White teaches an electronic device that includes a radio receiver. Pet. 55 (citing Ex. 1014, 9:53-57;10:32-42; 13:4-29). Patent Owner has not challenged this assertion. On the current record, we are persuaded that Petitioner's interpretation of White's teaching is reasonable. Accordingly, we are persuaded that there is

a reasonable likelihood that Petitioner will prevail in showing that claim 2 would have been rendered obvious by White.

Based on the foregoing, we are persuaded that Petitioner has demonstrated a reasonable likelihood that it will prevail in establishing the unpatentability of claims 1-4, 6, 7, 13, 21, 22, 24, 25, 27, 28, 34, 42-45, 47, and 48 as obvious over White.

*B. Grounds Based on Qureshey (Ex. 1011) and Berman (Ex. 1012)*

*1. Overview of Qureshey*

Qureshey is directed to “an intelligent radio apparatus that is adapted to allow a user to receive Web radio broadcasts in a manner similar to the ease and low cost with which a user receives a regular radio broadcast.” Ex. 1011, 1:28-30. Figure 1 is reproduced below:

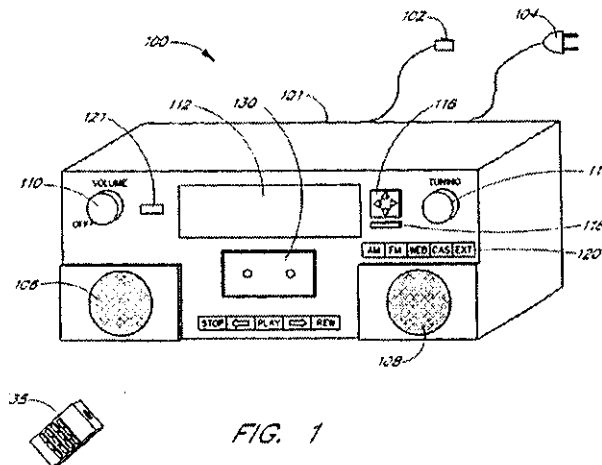


Figure 1 shows a perspective view of an embodiment of tabletop intelligent radio 100. Ex. 1011, 5:3, 3:12. A variety of user controls are provided on the face of radio 100. *Id.* at 5:9-18. In particular, “[t]he button bar 120 provides buttons to select an audio source, including, for example, ‘AM’ radio, ‘FM’ radio, ‘Web’ radio, ‘Cassette’, and ‘External’ input.” *Id.* at

5:11-12. Intelligent radio 100 may receive input from other sources including “an audio CD, a DVD, [or] a digital audio tape unit . . .” *Id.* at 6:25-27. The user can select a web radio station from a list of available web broadcasts. *Id.* at 4:8-12, 8:18-25, Fig. 3E. In some embodiments, a data storage device may be used to provide storage for audio material. *Id.* at 5:24-25. Intelligent radio 100 may be operated using a wireless remote 135 and also may include a wireless transceiver. *Id.* at 4:26-32, 12:21-13:5, Fig. 1 element 35; *see also id.* at Fig. 10 (depicting an embodiment including transceiver 1010).

## 2. Overview of Berman

Berman is directed to a playback unit that retrieves audio data from a remote server and plays songs that have been selected by the user. Ex. 1012, Abstract. An embodiment of Berman’s playback unit is depicted in Figure 1, which is reproduced below:

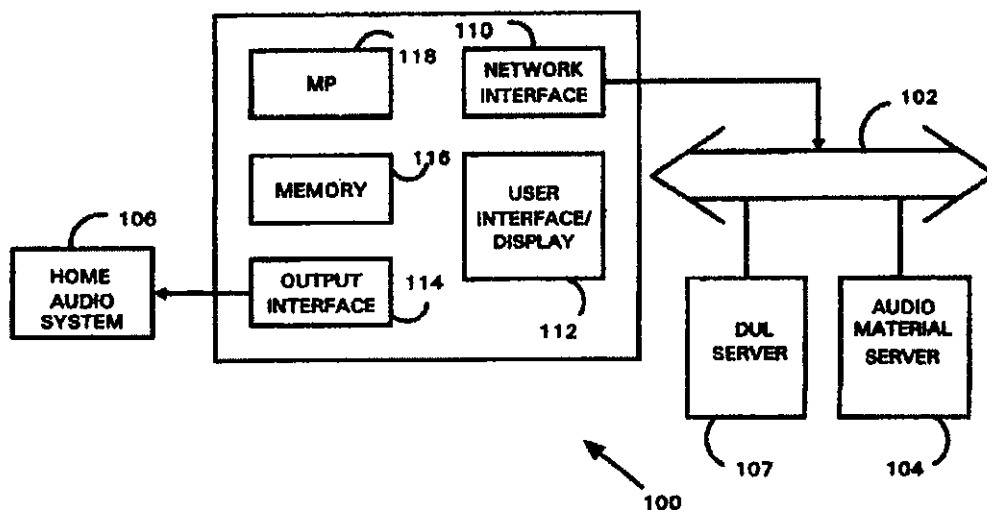


FIG. 1

Figure 1 is a block diagram of Berman’s playback unit 100. Ex. 1012, 4:17-19. Playback unit 100 receives audio material from audio material server

104 and access rights to this material are controlled by directory and user list (“DUL”) server 107. *Id.* at 4:51-53, 4:63-65. Playback unit 100 includes network interface 110 that facilitates communication with the servers over the Internet. *Id.* at 5:11-14. Memory 116 temporarily stores audio for playback and processing. *Id.* at 6:6-8. In certain embodiments, the user may be permitted to record a song to memory. *Id.* at 8:4-6. Berman’s playback unit may receive input from a wireless remote control. *Id.* at 5:46-49. The remote control unit may be used to move through the song list and search for songs. *Id.* at 5:54-61, 13:51-64, Figs. 2 and 13.

The operation of the playback unit is illustrated in Figures 3 and 4, which are reproduced below:

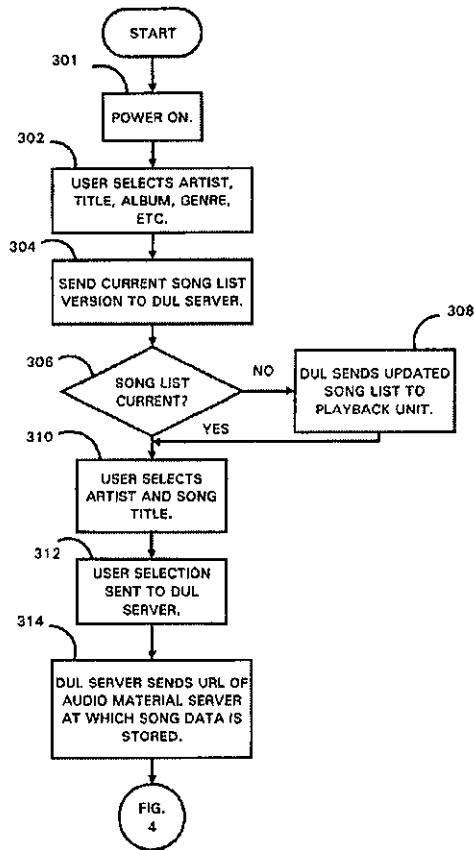


FIG. 3

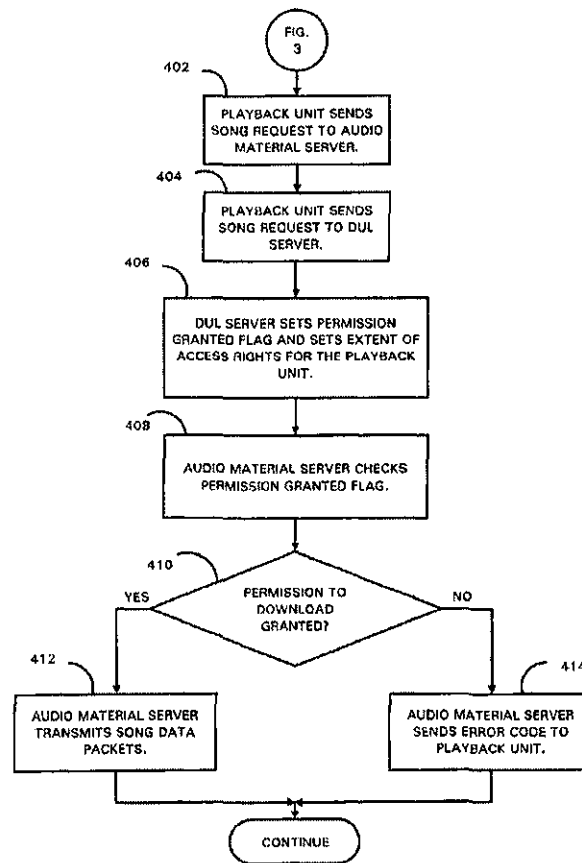


FIG. 4

Figures 3 and 4 are processing flow diagrams depicting the steps executed to request and receive audio material. Ex. 1012, 4:22-25. At step 302, the user selects a music category or type of song. *Id.* at 6:64-7:4. The playback unit then contacts the DUL server to confirm that the playback unit's song list is up to date. *Id.* at 7:4-6, Fig. 3 step 304. If the song list is not up to date, the DUL server will send an updated song list to the device. *Id.* at 7:14-19, Fig. 3 steps 306 and 308. In certain embodiments, the song list may be updated to reflect the user's preferred songs. *Id.* at 13:9-15. The user selects a song from the song list. *Id.* at 7:22-24. The DUL server then sends playback unit 100 to the network address or URL for the requested song. Ex. 1012, 7:30-41. Playback unit 100 then uses that URL to obtain the requested sound file



or streaming audio from the appropriate audio material server. *Id.* at 7:41-45, 8:32-34, Fig. 4 step 402 and 412.

*3. Analysis of Asserted Ground of Obviousness over Qureshey and Berman*

Petitioner contends that the teachings of Qureshey and Berman would have rendered obvious claims 1-4, 6-8, 10, 13, 21, 22, 24-29, 31, 42-45, 47-50, and 52 of the '652 Patent. Pet. 27-39. Petitioner relies on claim charts and the Declaration of Dr. Bove to show how these references allegedly describe the claimed subject matter. *Id.*; Ex. 1002.

According to Petitioner, Qureshey and Berman both “relate to a home audio device that plays audio from a remote source via a network interface.” Pet. 31. Petitioner persuasively argues that an ordinarily skilled artisan “would have easily recognized that the Internet radio receiver of Qureshey could have been improved by including the audio on demand features of Berman.” *Id.* Dr. Bove supports Petitioner’s argument by opining that at the time of the invention of the '652 Patent, such an artisan would have been aware of PCs that access both Internet radio and audio on demand and would have understood that adding audio on demand to an Internet radio device “would, for the most part, only involve modifying the user interface software to allow selecting between the functions, and programming additional server addresses into the system.” Ex. 1002 ¶ 22. In addition, Petitioner asserts that Qureshey’s radio accepts input from a number of different audio sources, so it would be logical for a person of ordinary skill in the art to add Berman’s on demand audio as an additional audio source. Pet. 31; *see also* Ex. 1011, 5:11-12 (listing “‘AM’ radio, ‘FM’ radio, ‘Web’ radio, ‘Cassette’, and ‘External’ input” as audio sources). On the record currently before us,

we are persuaded that Petitioner has demonstrated that a person of ordinary skill in the art would have been motivated to combine the teachings of Qureshey and Berman.

a) Independent Claim 1

Claim 1, in part, recites a control system adapted to receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;

Petitioner argues that Berman teaches a song list sent from the DUL server to the playback unit. Pet. 32 (citing Ex. 1012, 7:14-19, 9:47-49, Fig. 8); *see also* Ex. 1012, 10:23-28 (describing song list packet sent to playback unit with a user ID “to confirm that the updated song list information was sent to and received by the correct playback unit.”). Petitioner also asserts that the songs identified in the song list are stored on the audio material server 104 and, thus, the songs are not stored on the playback unit. *Id.* at 33 (citing Ex. 1012, 4:51-52).

Patent Owner argues that Berman does not teach a control system of an electronic device adapted to “receive the playlist assigned to the electronic device from the central system.” Prelim. Resp. 33-34. Specifically, Patent Owner asserts that Berman’s “song list” is not a “playlist” as recited by claim 1 and that the updated song list described in Berman does not render obvious the claimed “playlist assigned to the electronic device from the central system.” *Id.* Patent Owner describes Berman’s song list as “a catalog of available songs” and, thus, it falls within our construction of a playlist as “a list of audio files or URLs of where the

audio files were retrieved from.” *See* Prelim. Resp. 34. As stated in Section I.F.1 above, for the purposes of this Decision, we construe “playlist assigned to the electronic device” to mean “a list of audio files or URLs of where the audio files were retrieved from directed to a particular device selected by a user.” Patent Owner argues that Berman’s disclosure of updating of the song list does not teach this limitation. On the current record, we disagree with Patent Owner. As Petitioner has shown, Berman teaches sending a song list to a specific device. *See* Ex. 1012, 10:23-28; *see also* Ex. 1012, Fig. 8 (illustrating the song list packet sent to a playback unit). Berman discloses an error checking mechanism to confirm that the updated song list was “received by the correct playback unit.” *Id.* 10:24-28. Thus, we are persuaded that Berman teaches or suggests a control system of an electronic device adapted to “receive the playlist assigned to the electronic device from the central system.”

With respect to the remaining limitations of claim 1, we have reviewed Petitioner’s supporting evidence and determine that Petitioner has met the threshold standard of 35 U.S.C § 314(a). On this record, we are persuaded that there is a reasonable likelihood that Petitioner will prevail in showing that claim 1 would have been rendered obvious by Qureshey and Berman.

b) Independent Claims 21 and 42

Independent claims 21 and 42 recite limitations similar to those of claim 1 and, therefore, we are persuaded that there is a reasonable likelihood that Petitioner will prevail in showing that claims 21 and 42 would have been rendered obvious by Qureshey and Berman.

c) Dependent Claims

With respect to the remaining dependent claims 2-4, 6-8, 10, 13, 22, 24-29, 31, 43-45, 47-50, and 52, we have reviewed Petitioner's supporting evidence and determine that Petitioner has the threshold standard of 35 U.S.C § 314(a). For example, claim 2 depends from claim 1 and recites "wherein the control system is further adapted to enable playback from a broadcast radio source." Petitioner argues that Qureshey teaches an intelligent radio that can receive AM and FM radio broadcasts. Pet. 33 (citing Ex. 1011, 6:25-7:2); *see also* Ex. 1011, 5:10-12 (listing AM and FM radio as audio sources). Patent Owner has not challenged this assertion. On the current record, we are persuaded that Petitioner has shown sufficiently that Qureshey teaches the limitations of claim 2.

Based on the foregoing, we are persuaded that Petitioner has demonstrated a reasonable likelihood that it will prevail in establishing the unpatentability of claims 1-4, 6-8, 10, 13, 21, 22, 24-29, 31, 42-45, 47-50, and 52 of the '652 Patent as obvious over Qureshey and Berman.

*4. Analysis of Asserted Ground of Obviousness over Qureshey, Berman, and Leeke*

Petitioner contends that the teachings of Qureshey, Berman, and Leeke would have rendered obvious claims 11, 32, and 53 of the '652 Patent. Pet. 39. Leeke is directed to a content player and server. Ex. 1010, Abstract. Leeke discloses displaying auxiliary information in response to a user request. *Id.* at 14:30-33, 20:64-21:2. "The auxiliary information can include specific information for the current title such as album cover graphics, liner notes, tray back images, images of the artist(s), producer and writer credits, and distribution label information, for example." *Id.* at 21:2-

6, 14:34-37. Petitioner asserts that these teachings, in conjunction with those of Qureshey and Berman, would have rendered obvious dependent claims 11, 32, and 53. Pet. 39. Claim 11 depends from 1 and recites:

wherein the control system is further adapted to:

- a) send a request to a remote server for supplemental information related to a song in real-time while the song is playing;
- b) receive the supplemental information from the remote server;  
and
- c) present the supplemental information to the user of the electronic device.

Claims 32 and 53 respectively depend from claims 21 and 42 and recite commensurate limitations. Dr. Bove opines that it would have been obvious to provide Leeke's supplemental information along with Berman's audio on demand. Ex. 1002 ¶ 24. He states that this combination entails applying a known technique to a known device. *Id.* On the record currently before us, we are persuaded that Petitioner has shown sufficiently that Qureshey, Berman, and Leeke would have rendered obvious claims 11, 32, and 53.

*C. Analysis of Asserted Grounds of Unpatentability over Leeke*

Petitioner asserts that Leeke anticipates or renders obvious claims 1, 2, 4, 6, 7, 10, 11, 13, 14, 21, 22, 24, 25, 28, 31, 32, 34, 35, 42, 43, 45, 47, 48, 52, 53, 55, and 56 of the '652 Patent. Pet. 14-27. Leeke discloses a content player and server. Ex. 1010, Abstract. Leeke's system is composed of servers 102 and 144, client apparatuses 104 and 106, and electronic network 100.

Patent Owner argues that Leeke does not anticipate or teach an electronic device that includes a control system adapted to “receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source.” Prelim. Resp. 25. This limitation is found in all of the independent claims at issue in this Petition. Petitioner asserts that Leeke’s client apparatus 106 receives URLs that enable the player to obtain the songs from servers 102 or 144. Pet. 20 (citing Ex. 1010, 4:50-67, 5:33-35, 19:59-20:49, 43:14-17, 49:12-16). On the current record, we are not persuaded that Leeke discloses or teaches the disputed limitation. The cited portions disclose URLs used to update the database files in content entry subsystem 1600, which is located on the server. *See* Figs. 1 and 58, 43:14-17. Thus, the cited portions of Leeke do not describe sending URLs associated with a playlist to the client apparatus. Therefore, we are not persuaded that Leeke anticipates or renders obvious claims 1, 2, 4, 6, 7, 10, 11, 13, 14, 21, 22, 24, 25, 28, 31, 32, 34, 35, 42, 43, 45, 47, 48, 52, 53, 55, and 56 of the ’652 Patent.

*D. Analysis of Asserted Grounds of Unpatentability over Lansonic DAS-750*

Petitioner asserts that Lansonic DAS-750 anticipates or renders obvious claims 1-4, 6, 7, 10, 21, 22, 24, 25, 27-29, 31, 42-45, 47, 48, and 52 of the ’652 Patent. Pet. 40-50. Petitioner also asserts that dependent claims 8, 26, and 49 would have been obvious over Lansonic DAS-750. *Id.* at 51. Lansonic DAS-750 is a collection of web pages obtained using the Internet Archive Wayback machine. Pet. 40. “For a prior art reference to anticipate a claim, the reference must disclose each claim limitation in a single document.” *Apple Inc. v. Int’l Trade Com’n*, 725 F.3d 1356, 1362 (Fed. Cir.

2013) (citing *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed.Cir.2000)). Thus, as a threshold matter we must determine whether Petitioner has shown sufficiently that Lansonic DAS-750 is a single document. Petitioner asserts that these web pages were accessible from a menu on Lansonic's home page. Pet. 40. We note that there is only one page in the Lansonic DAS-750 that shows any navigation links that could link to the other pages of the Lansonic DAS-750. Ex. 1013, 1. In addition, the pages in evidence show archive dates of June 19, 2000; August, 15, 2000; August 17, 2000; and September 18, 2000. *Id.* at 1, 3, 5, 7. We are not persuaded that these web pages with varying archival dates are a single publication for purposes of a 35 U.S.C. § 102 analysis. Thus, we are not persuaded that Lansonic-DAS anticipates claims 1-4, 6, 7, 10, 21, 22, 24, 25, 27-29, 31, 42-45, 47, 48, and 52 of the '652 Patent.

As to the obviousness ground, Patent Owner argues that Lansonic DAS-750 does not "receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote server." Prelim. Resp. 39. This limitation is found in all of the independent claims at issue in this Petition. Petitioner asserts that the Lansonic DAS-750 device as described in the reference can play songs stored on other networked devices and thus, "the playlist necessarily has information enabling it to obtain songs from the remote source." Pet. 44. Dr. Bove concurs and opines that "[i]f such information were not there, the device would not be able to obtain the remotely stored songs." Ex. 1002 ¶ 26. We are not persuaded that the Lansonic DAS-750 device as described by Exhibit 1002 necessarily requires such information as part of its playlist. Dr. Bove's declaration does not contain sufficient technical detail or

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explanation to persuade us that Lansonic-DAS 750 must have the claimed “information.” Therefore, we are not persuaded that Lansonic DAS-750 would have rendered obvious claims 1-4, 6-8, 10, 21, 22, 24-29, 31, 42-45, 47-49, and 52 of the ’652 Patent.

### III. CONCLUSION

We conclude that Petitioner has demonstrated a reasonable likelihood of prevailing on the following grounds of unpatentability asserted in the Petition:

Claims 1-4, 6, 7, 13, 21, 22, 24, 25, 27, 28, 34, 42-45, 47, and 48 as obvious over White;

Claims 1-4, 6-8, 10, 13, 21, 22, 24-29, 31, 42-45, 47-50, and 52 as obvious over Qureshey and Berman; and

Claims 11, 32, and 53 as obvious over Qureshey, Berman, and Leeke.

The Petition is denied as to all other grounds proposed. The Board has not made a final determination on the patentability of the challenged claims.

### IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is granted as to claims 1-4, 6-8, 10, 11, 13, 21, 22, 24-29, 31, 32, 34, 42-45, 47-50, 52, and 53 of the ’652 Patent, and denied as to claims 14, 35, 55, and 56;

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the ’652 Patent is hereby instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial;



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FURTHER ORDERED that the trial is limited to the grounds identified above and no other grounds set forth in the Petition as to claims 1-4, 6-8, 10, 11, 13, 21, 22, 24-29, 31, 32, 34, 42-45, 47-50, 52, and 53 are authorized; and

FURTHER ORDERED that an initial conference call with the Board is scheduled for 4 PM Eastern Time on April 9, 2014. The parties are directed to the Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,765-66 (Aug. 14, 2012), for guidance in preparing for the initial conference call, and should be prepared to discuss any proposed changes to the Scheduling Order entered herewith and any motions the parties anticipate filing during the trial.

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# **EXHIBIT 10**



US008050652B2

(12) **United States Patent**  
**Qureshey et al.**

(10) **Patent No.:** **US 8,050,652 B2**  
(45) **Date of Patent:** **\*Nov. 1, 2011**

(54) **METHOD AND DEVICE FOR AN INTERNET RADIO CAPABLE OF OBTAINING PLAYLIST CONTENT FROM A CONTENT SERVER**

(75) Inventors: **Safi Qureshey**, Santa Ana, CA (US);  
**Daniel D. Sheppard**, Brca, CA (US)

(73) Assignee: **Horsham Enterprises, LLC**,  
Wilmington, DE (US)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1374 days.  
This patent is subject to a terminal disclaimer.

(21) Appl. No.: **11/563,232**

(22) Filed: **Nov. 27, 2006**

(65) **Prior Publication Data**  
US 2007/0089132 A1 Apr. 19, 2007

**Related U.S. Application Data**

(63) Continuation of application No. 09/805,470, filed on Mar. 12, 2001, now abandoned, which is a continuation-in-part of application No. 09/096,703, filed on Jun. 12, 1998, now abandoned.

(60) Provisional application No. 60/246,842, filed on Nov. 8, 2000, provisional application No. 60/072,127, filed on Jan. 22, 1998.

(51) **Int. Cl.**  
**H05K 11/00** (2006.01)  
**G06F 15/16** (2006.01)  
**H04N 5/445** (2011.01)

(52) **U.S. Cl.** ..... **455/344; 455/556.1; 455/557; 455/414.1; 455/414.3; 709/217; 709/219; 725/39; 725/45**

(58) **Field of Classification Search** ..... **455/3.02, 455/3.06, 142, 150.1, 151.1, 151.2, 154.1, 455/154.2, 158.1, 158.2, 158.4, 186.1, 344, 455/414.1, 414.3, 456.2, 556.1, 557; 709/217, 709/219; 725/39, 45, 18**

See application file for complete search history.

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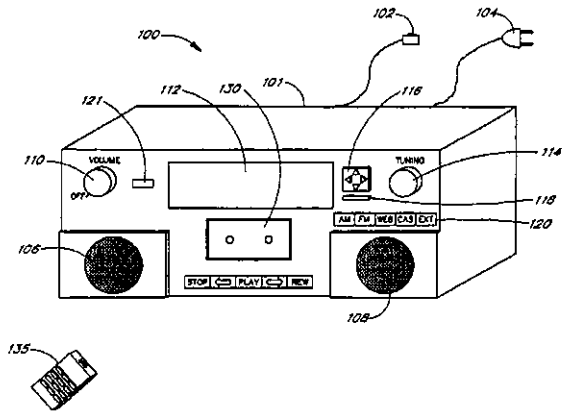
"A Music Revolution ... SoundServer," imerge, 2 pages.  
(Continued)

*Primary Examiner* --- Pablo Tran  
(74) *Attorney, Agent, or Firm* --- Withrow & Terranova, PLLC

(57) **ABSTRACT**

A network-enabled audio device that provides a display device that allows the user to select playlists of music much like a jukebox is disclosed. The user can compose playlists from disk files, CD's, Internet streaming audio broadcasts, online music sites, and other audio sources. The user can also select a desired Web broadcast from a list of available Web broadcasts. In addition, the user can play standard audio CD's and MP3 encoded CD's and have access to local AM/FM stations. Further, the software, the user controls, and the display in the network-enabled audio device are operably configured and connected such that the user can listen to playlists that include CD's and other audio sources just as the user would choose a playlist in a jukebox. The user accesses a server site via a PC and the Internet. From the server site, the user obtains a list of the devices in his or her Internet Personal Audio Network (IPAN) and what songs are on those devices. The IPAN includes an IPAN server, an IPAN client, and IPAN software stored on the network-enabled audio device. Thus, the network-enabled audio device provides people who are or are not comfortable with computers a way of taking music from various sources and putting it into one place for listening pleasure. In one embodiment, the Personal Computer (PC) is used to compose the playlists, but the user is able to listen to playlists and other audio sources without using the PC.

**64 Claims, 49 Drawing Sheets**



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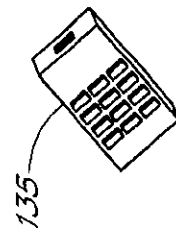
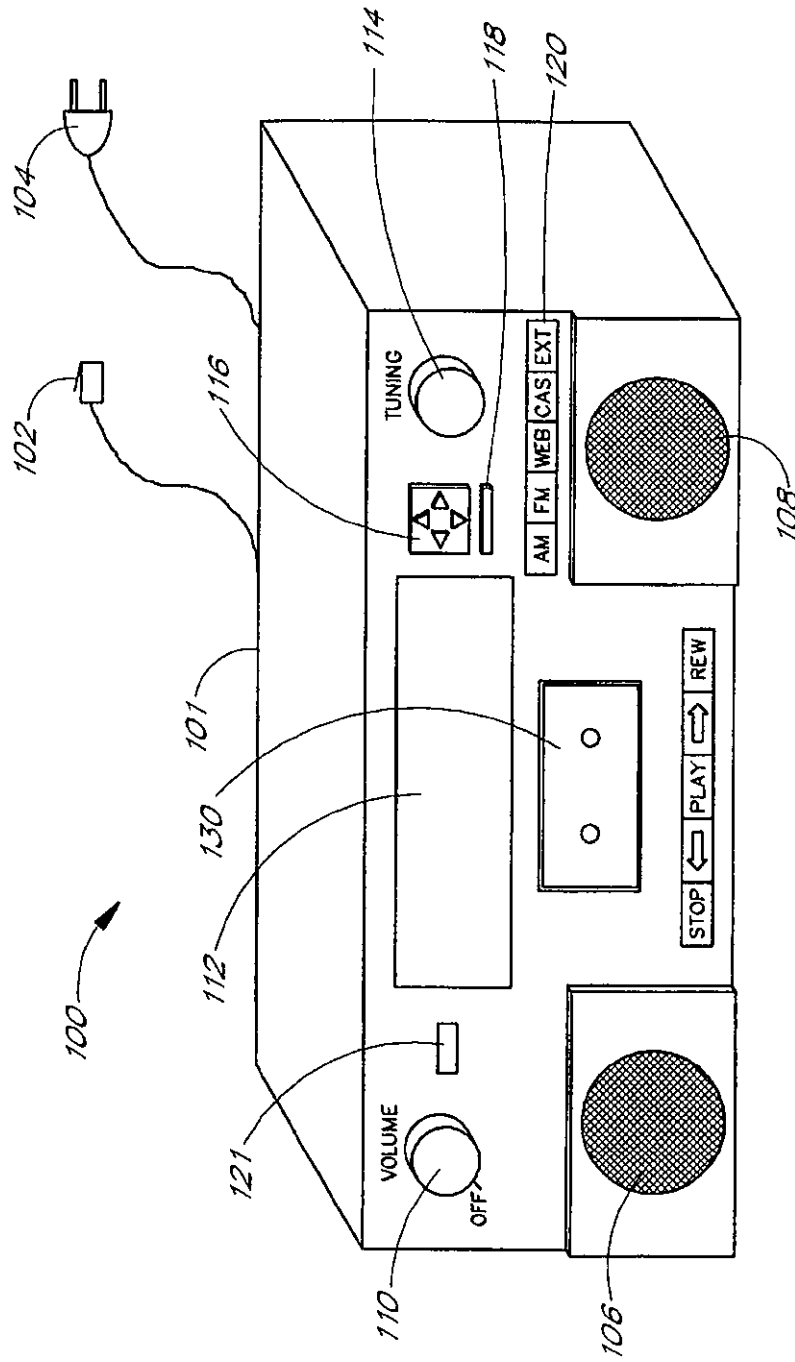


FIG. 1

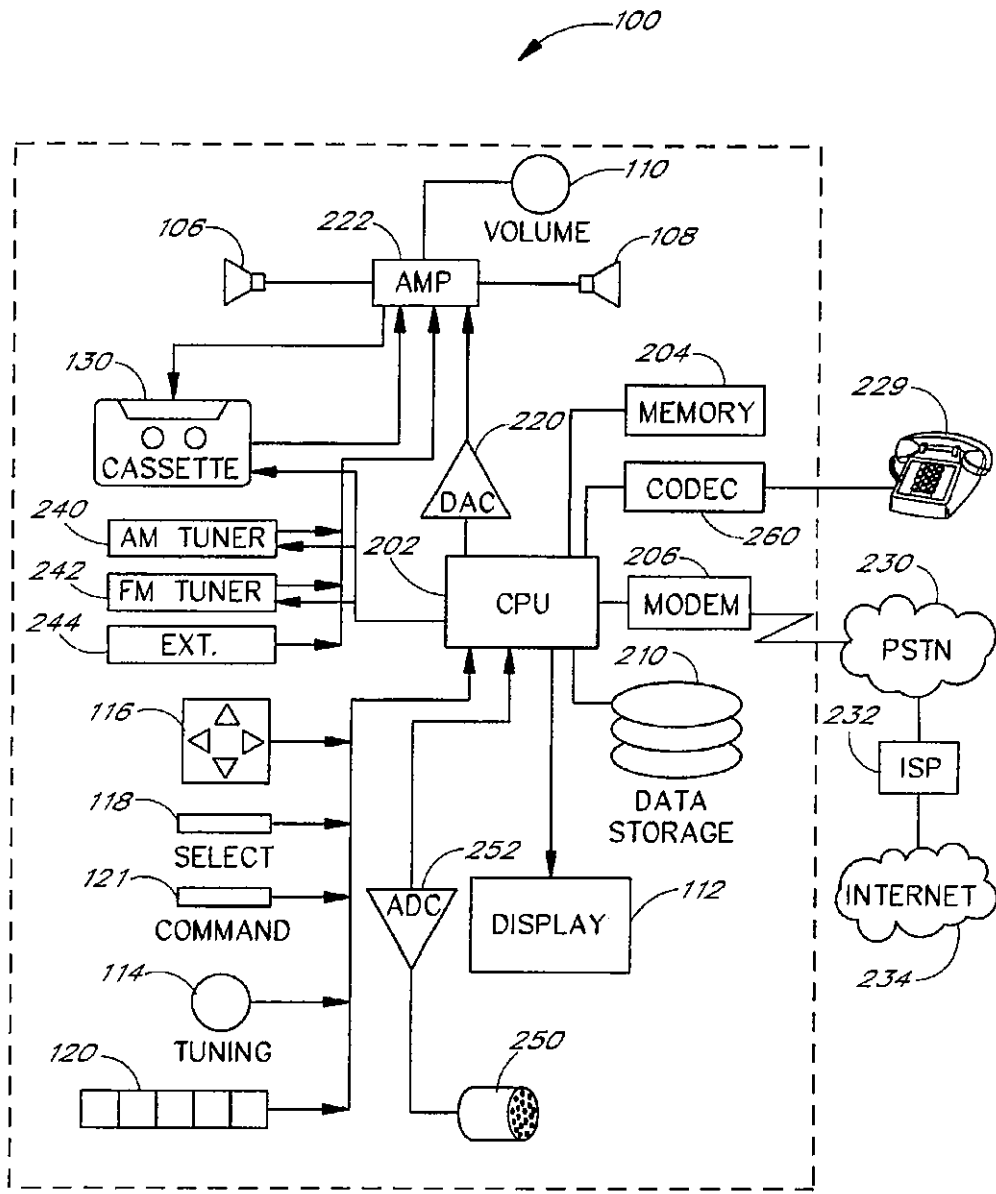


FIG. 2

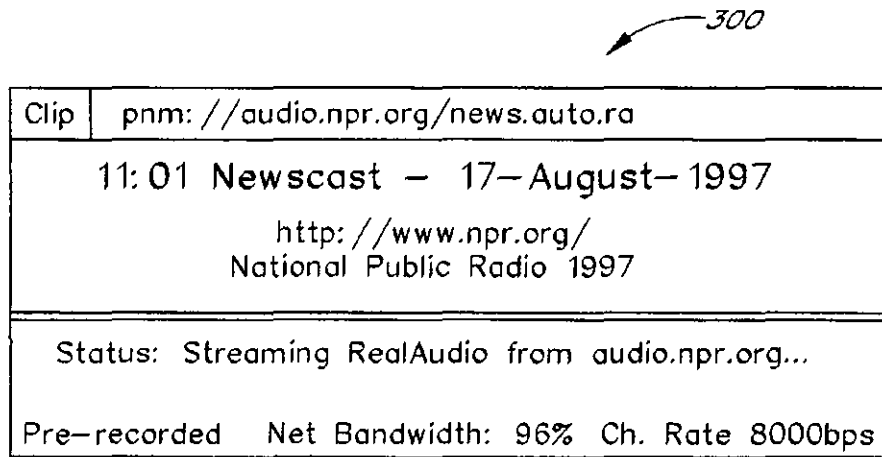


FIG. 3A

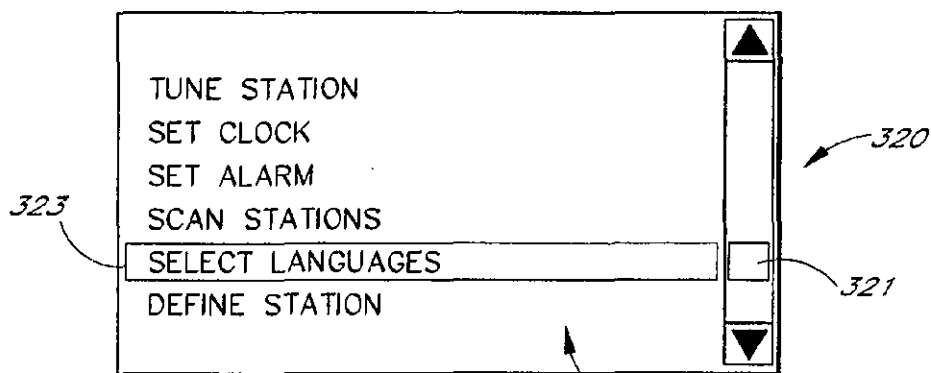


FIG. 3B

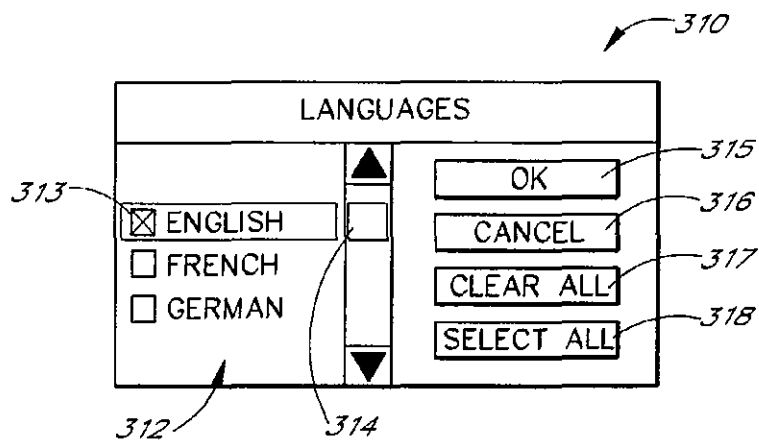


FIG. 3C



FIG. 3D

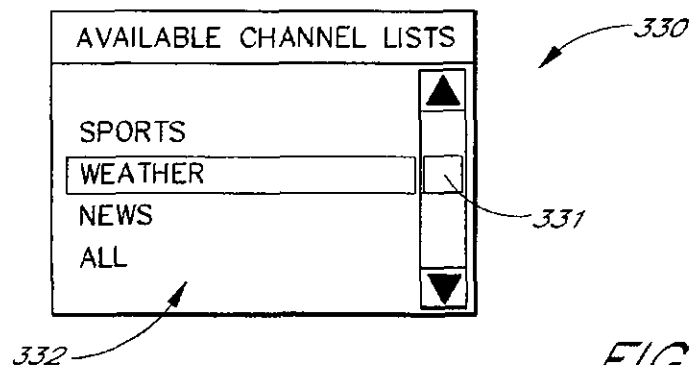


FIG. 3E

340

341

342

343

ID	Description	Address
<input type="checkbox"/> ABC	ABC Hourly News	<a href="http://www.rbn.com/clg-bin/r.pl?swave/abc/wnews.ra">http://www.rbn.com/clg-bin/r.pl?swave/abc/wnews.ra</a>
<input type="checkbox"/> AFnews	AirForce Radio News update	<a href="http://www.af.mil/news/radio/latest.ram">http://www.af.mil/news/radio/latest.ram</a>
<input checked="" type="checkbox"/> City	Citynews from around the w...	<a href="http://www.citynews.co.uk/">http://www.citynews.co.uk/</a>
<input type="checkbox"/> Counter...	CounterSpin-weekly rt win...	<a href="http://www.webactive.com/webactive/content/cspin">http://www.webactive.com/webactive/content/cspin</a>
<input type="checkbox"/> DlyFeed	The Daily Feed- Satire colu...	<a href="http://www.dailyfeed.com/Latest_Feed.html">http://www.dailyfeed.com/Latest_Feed.html</a>
<input type="checkbox"/> EIC-env	Environmental Information...	<a href="http://www.webactive.com/webactive/audio/raconten">http://www.webactive.com/webactive/audio/raconten</a>
<input type="checkbox"/> Earth	Earth and Sky daily update	<a href="http://www.earthsky.com/today.ram">http://www.earthsky.com/today.ram</a>
<input type="checkbox"/> IaAgg	Iowa Agrigulture news	<a href="http://www.agnews.com/features/news/ianews.html">http://www.agnews.com/features/news/ianews.html</a>
<input type="checkbox"/> Leeza	Leeza's entertainment upda...	<a href="http://www.premrad.com/">http://www.premrad.com/</a>
<input type="checkbox"/> MFarm	Missouri Farm Report	<a href="http://www.agnews.com/audio/momr.ram">http://www.agnews.com/audio/momr.ram</a>

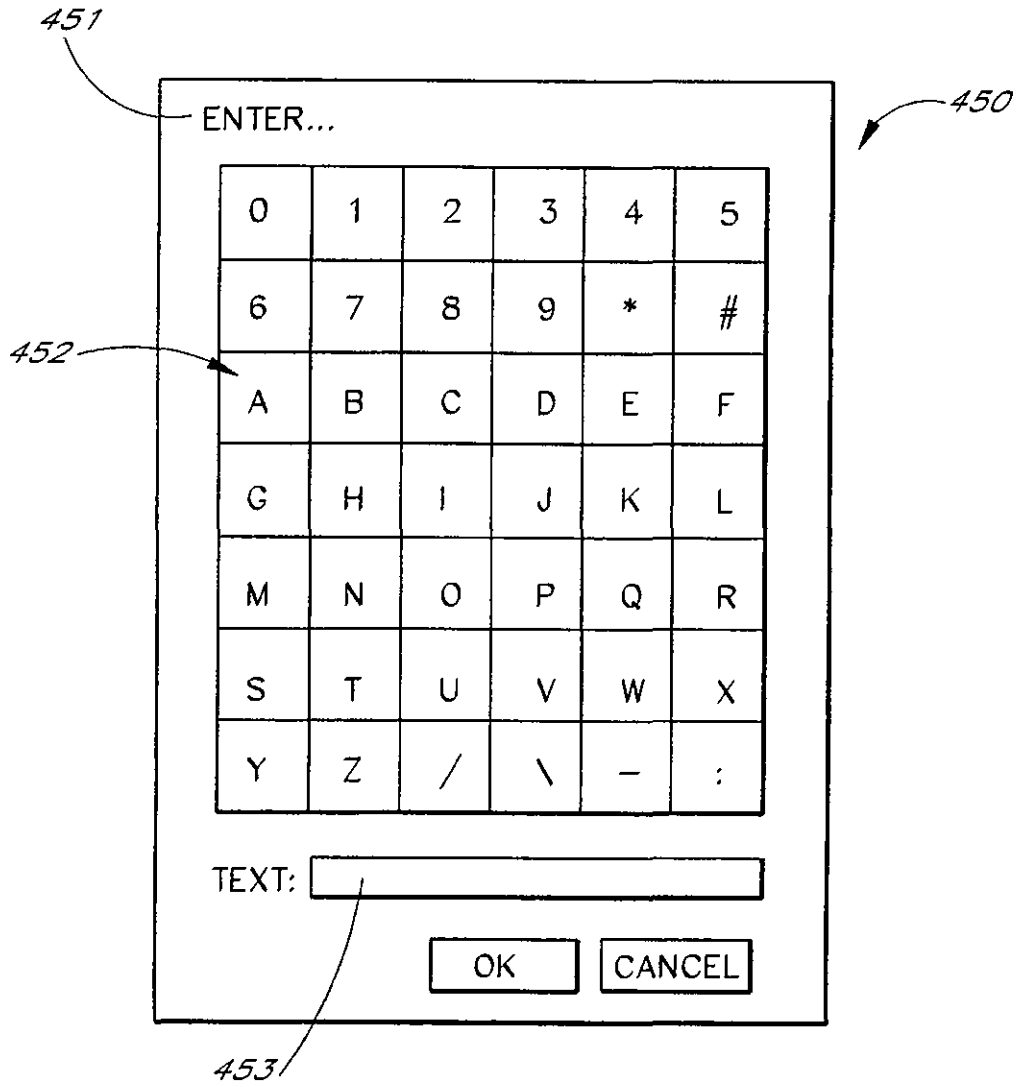


FIG. 4

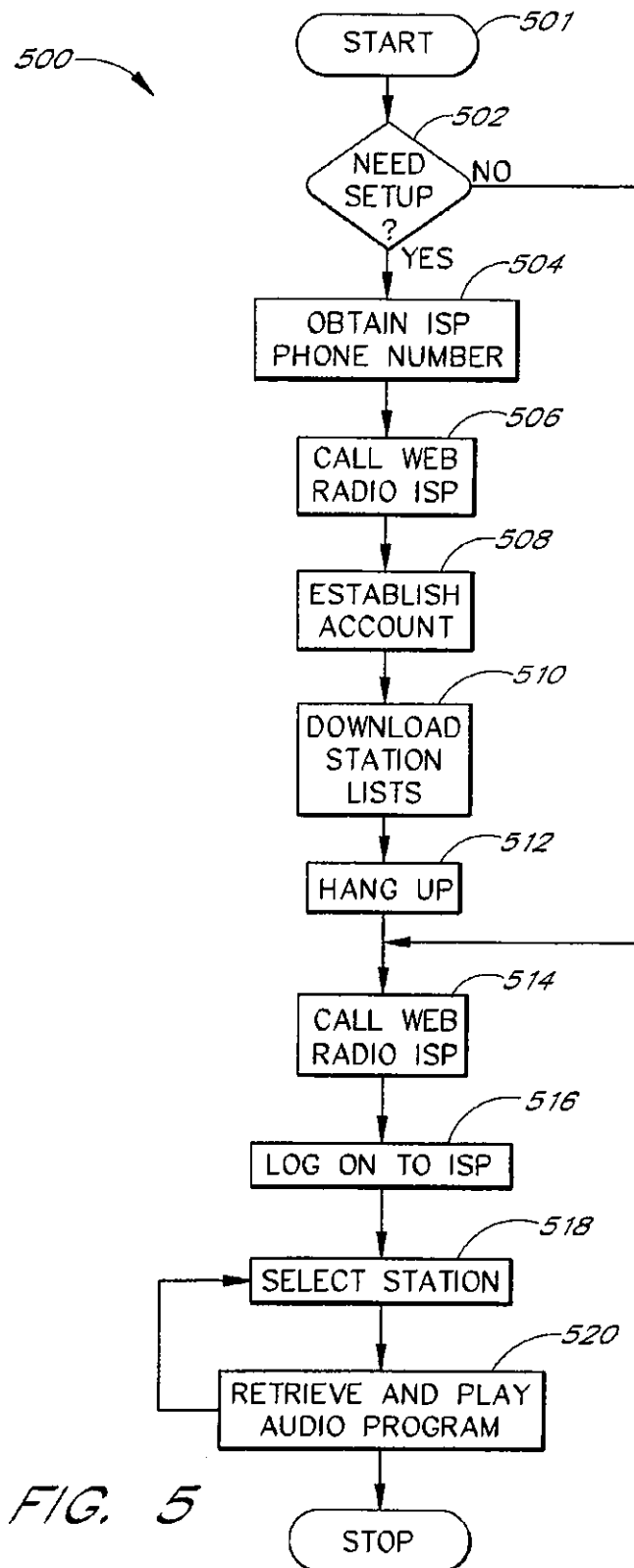


FIG. 5

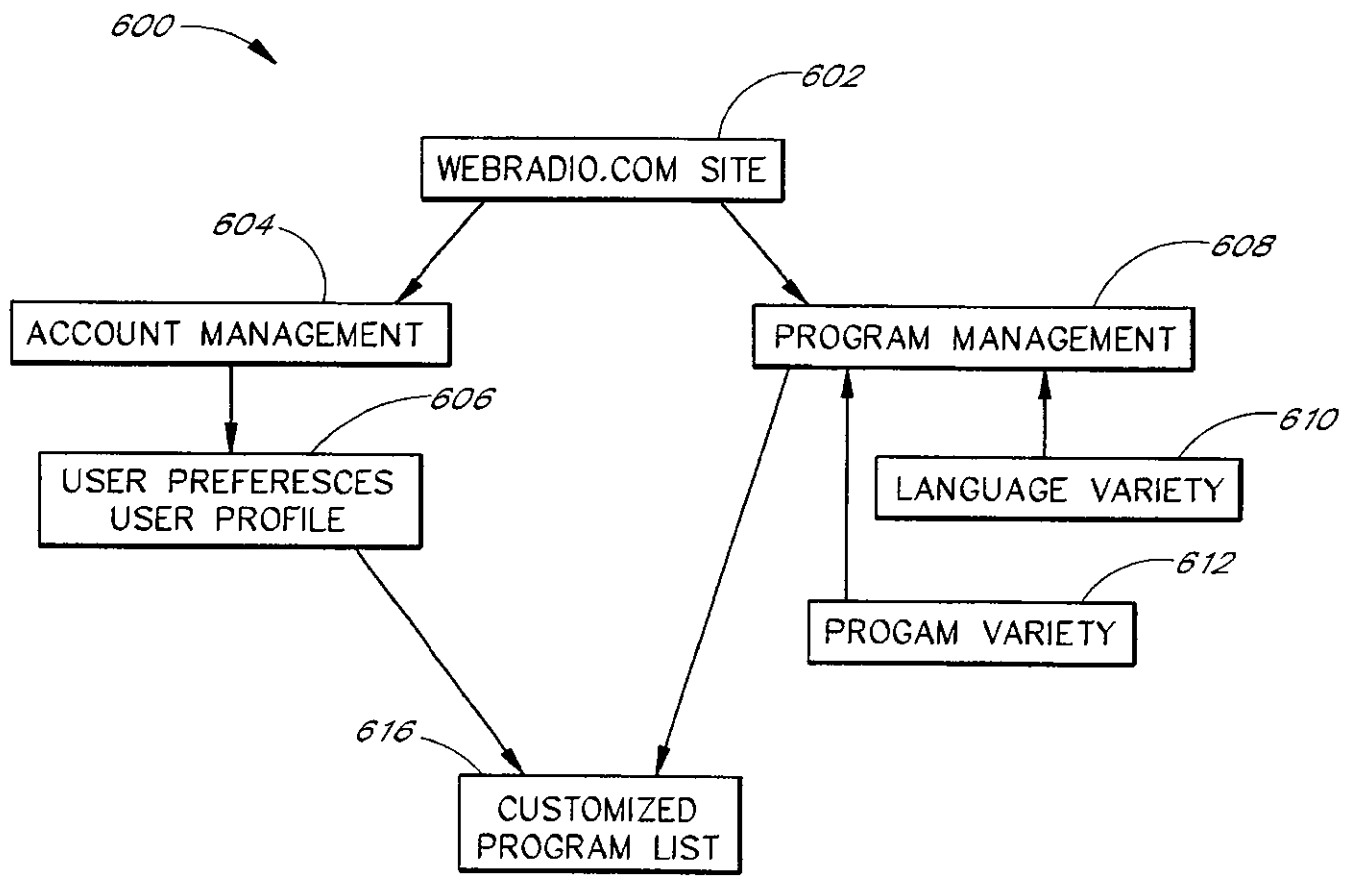


FIG. 6

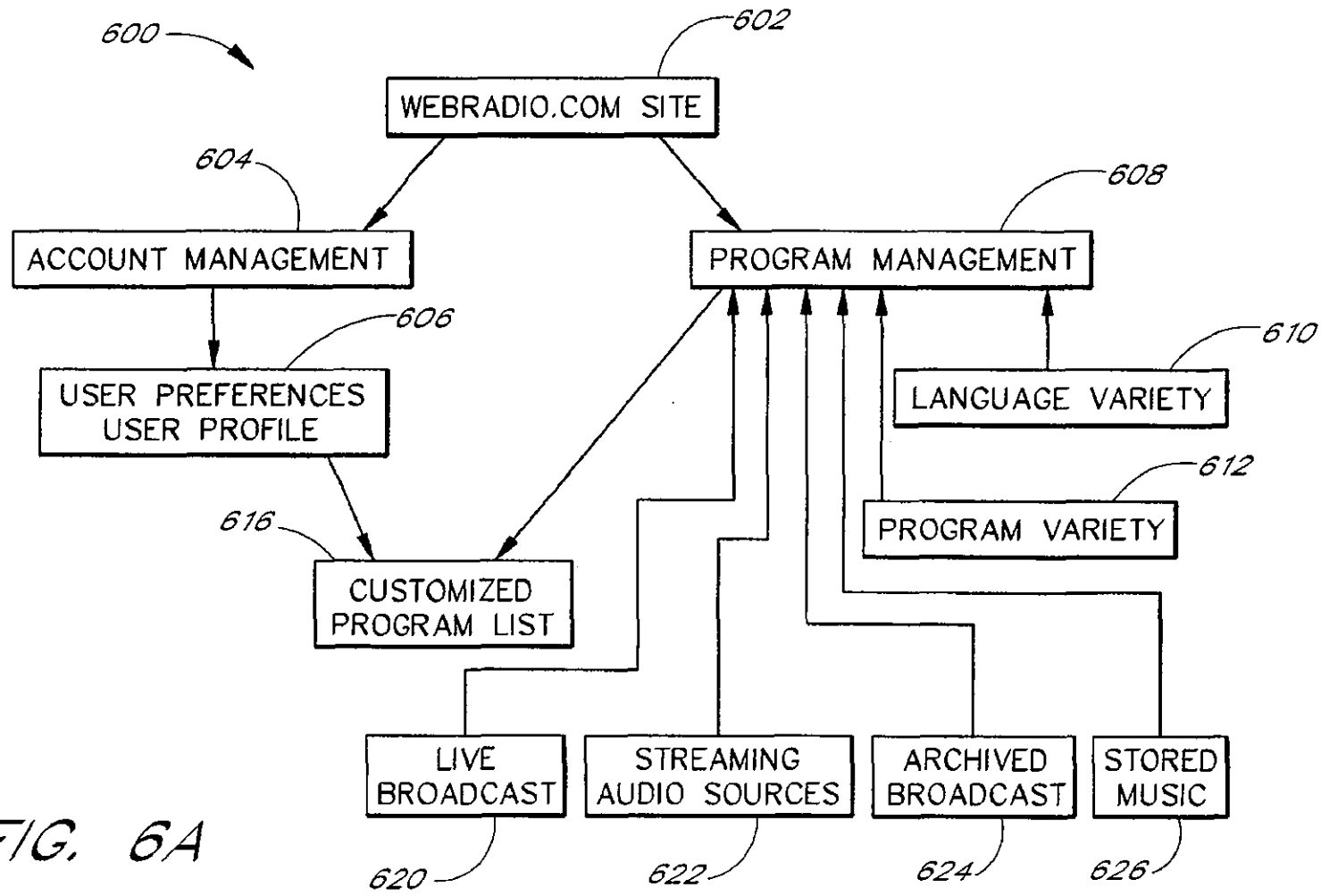


FIG. 6A

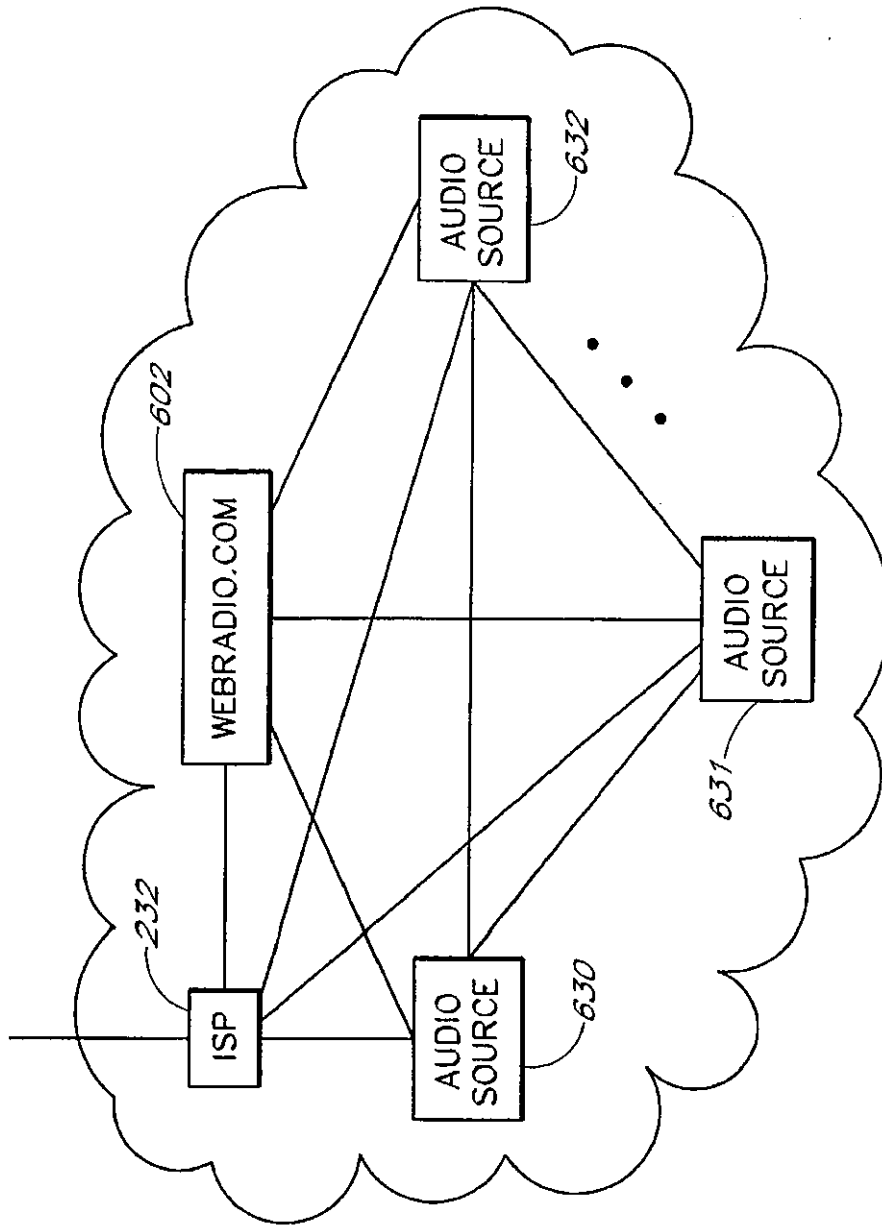


FIG. 6B

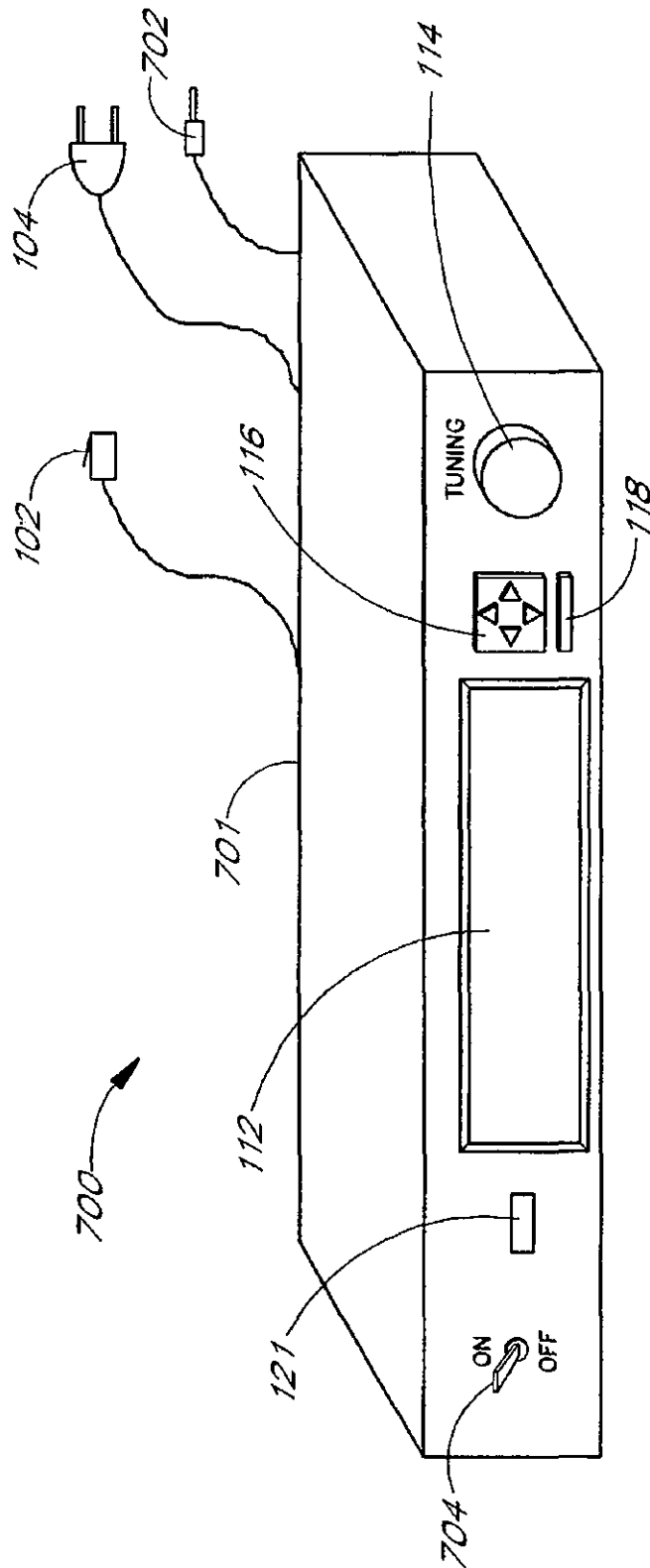


FIG. 7

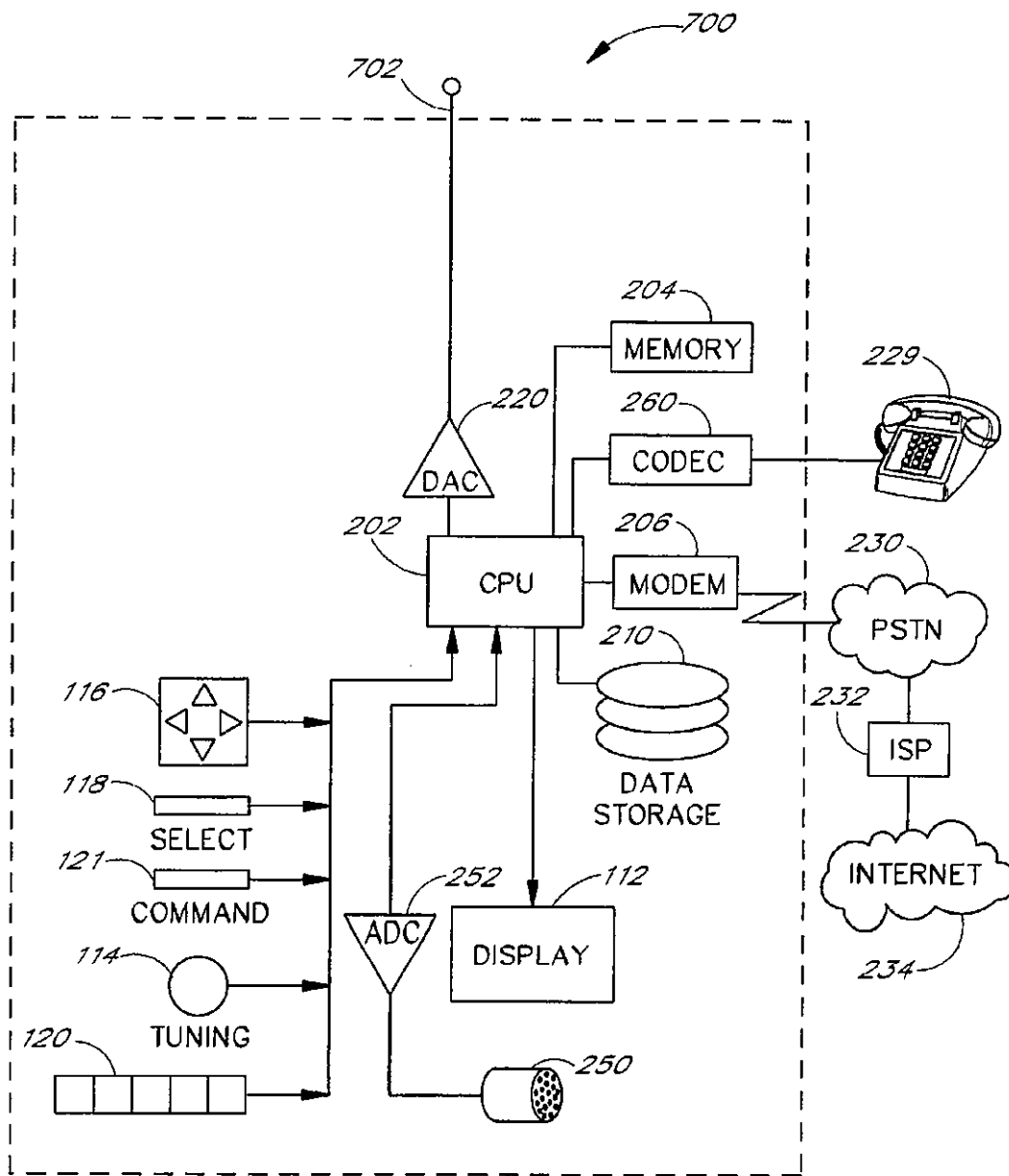


FIG. 8



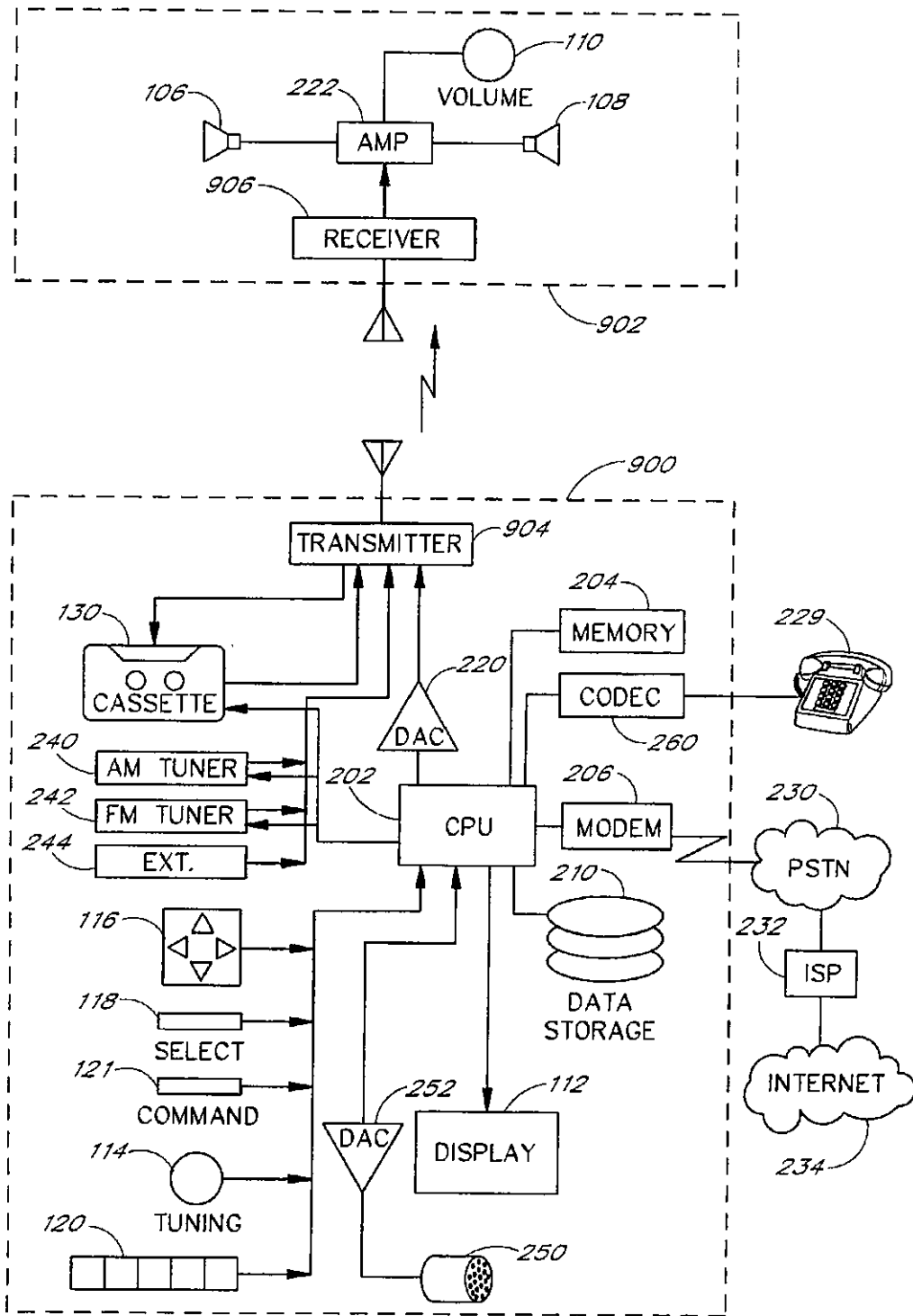


FIG. 9

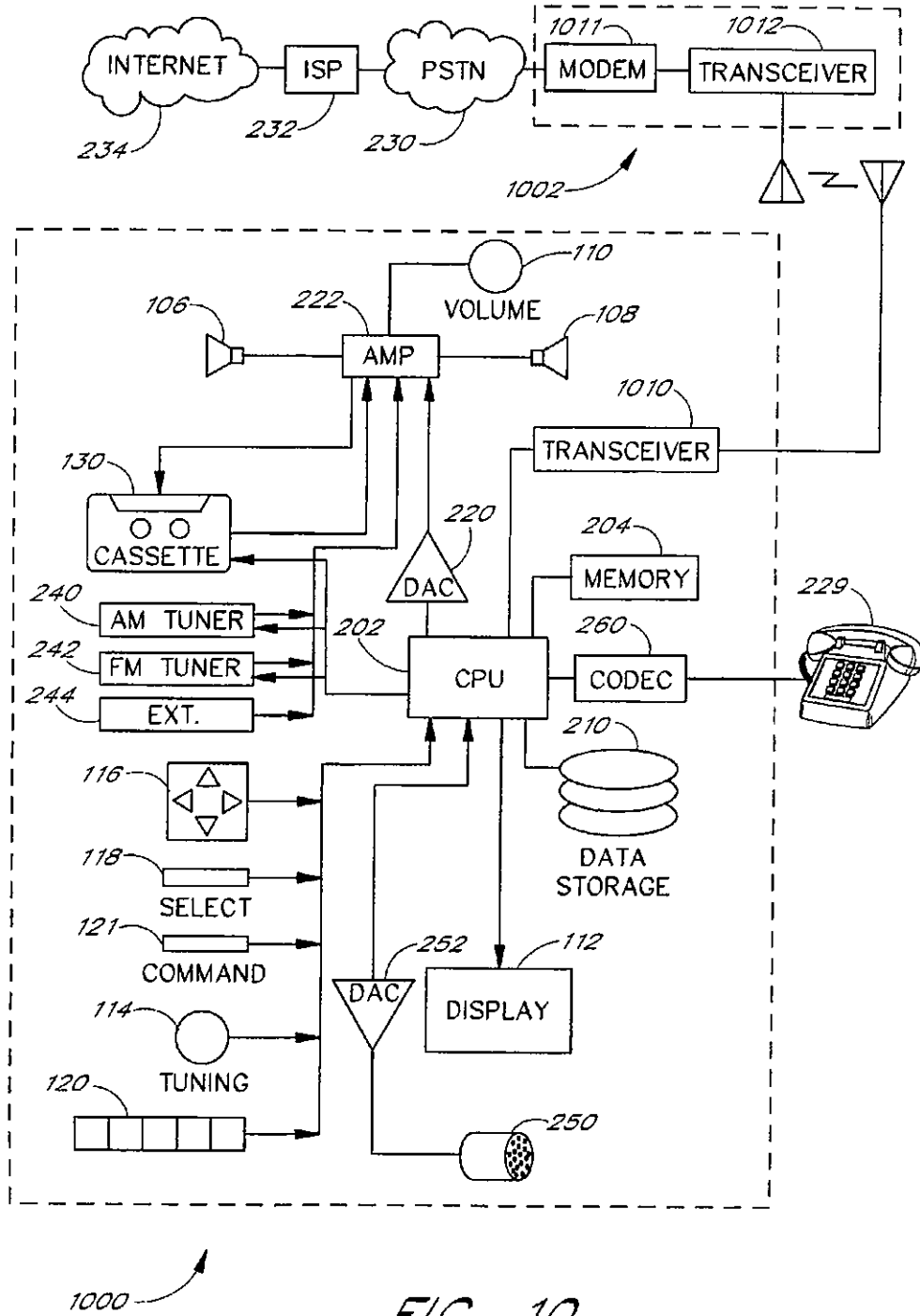


FIG. 10

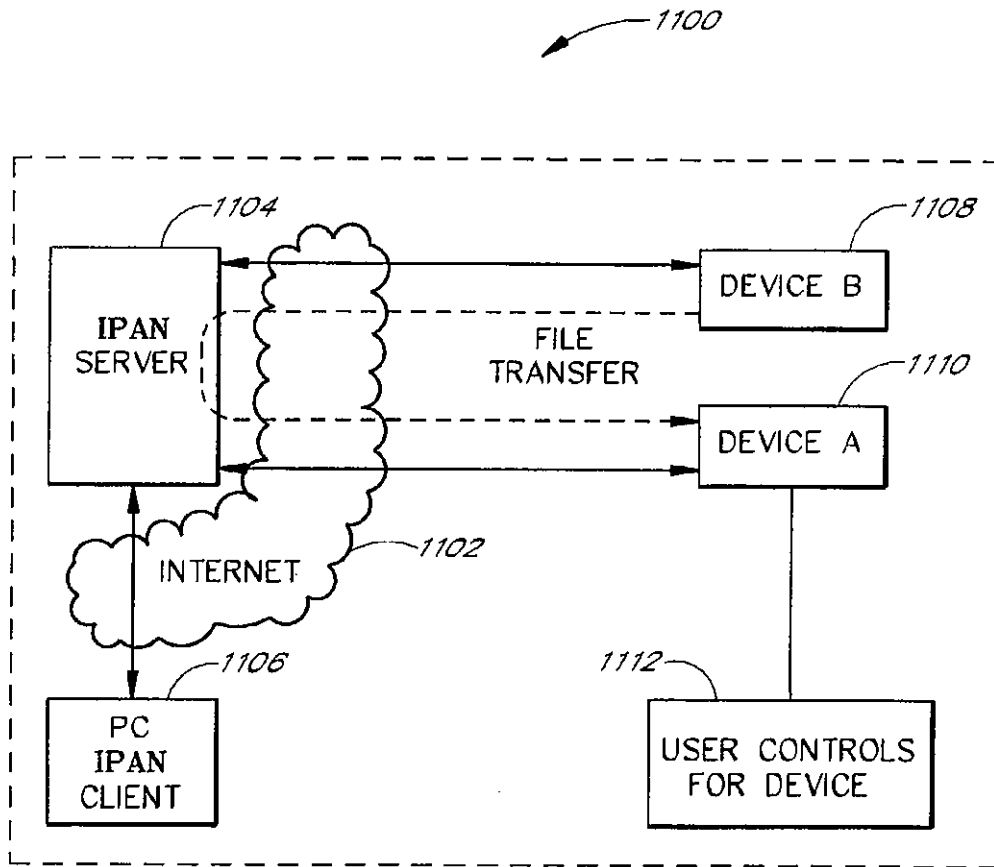


FIG. 11

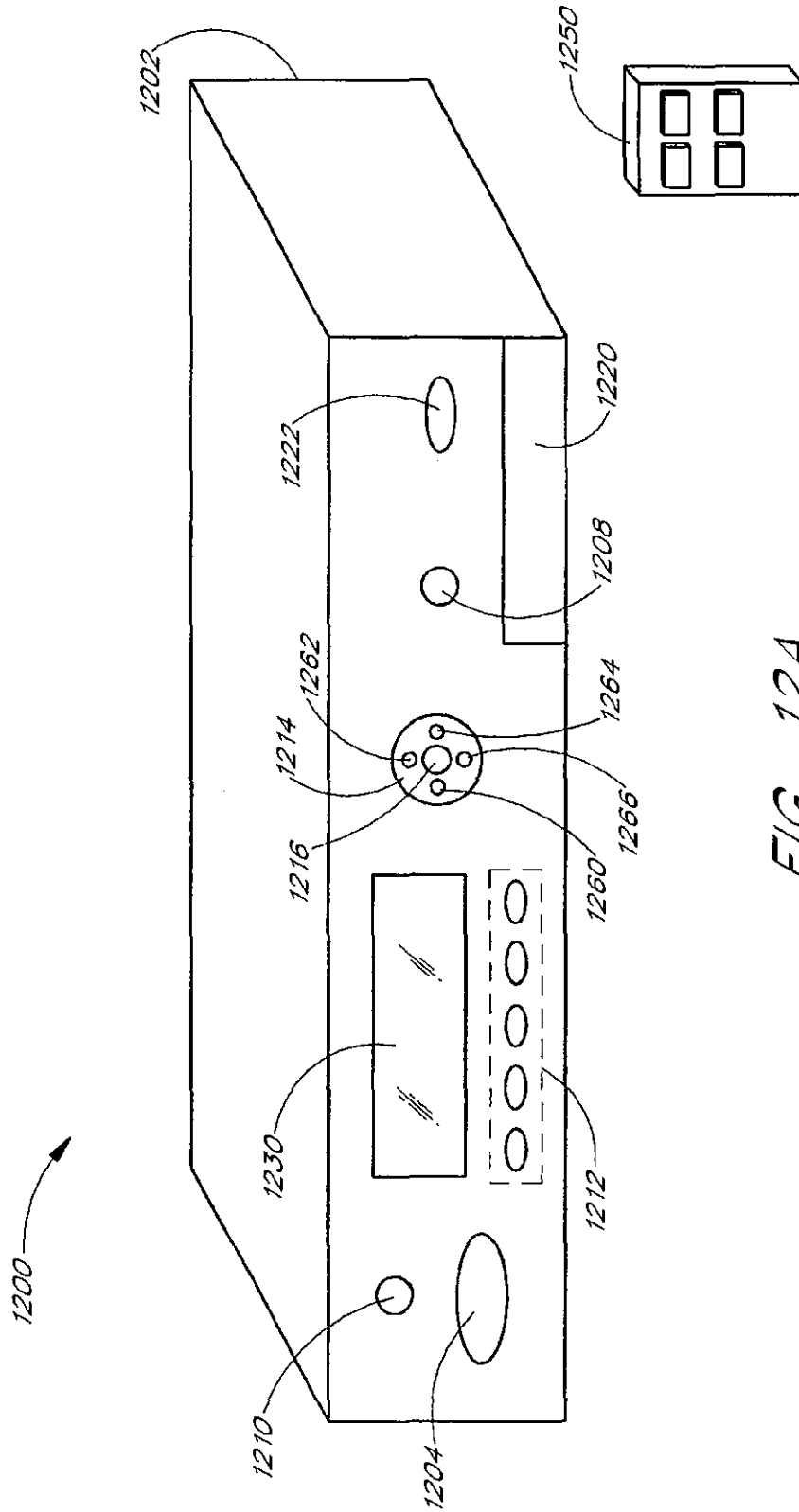


FIG. 12A

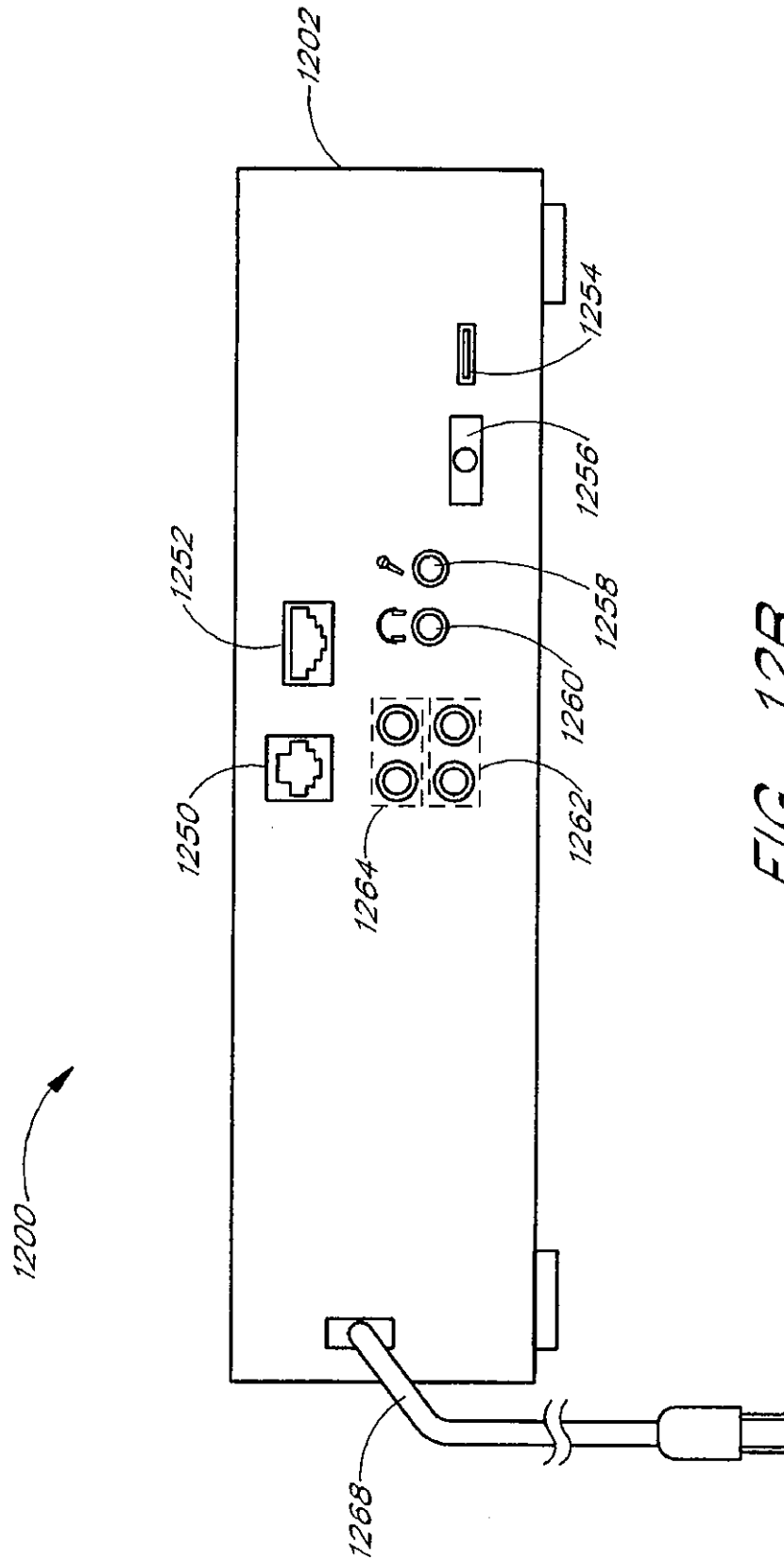


FIG. 12B

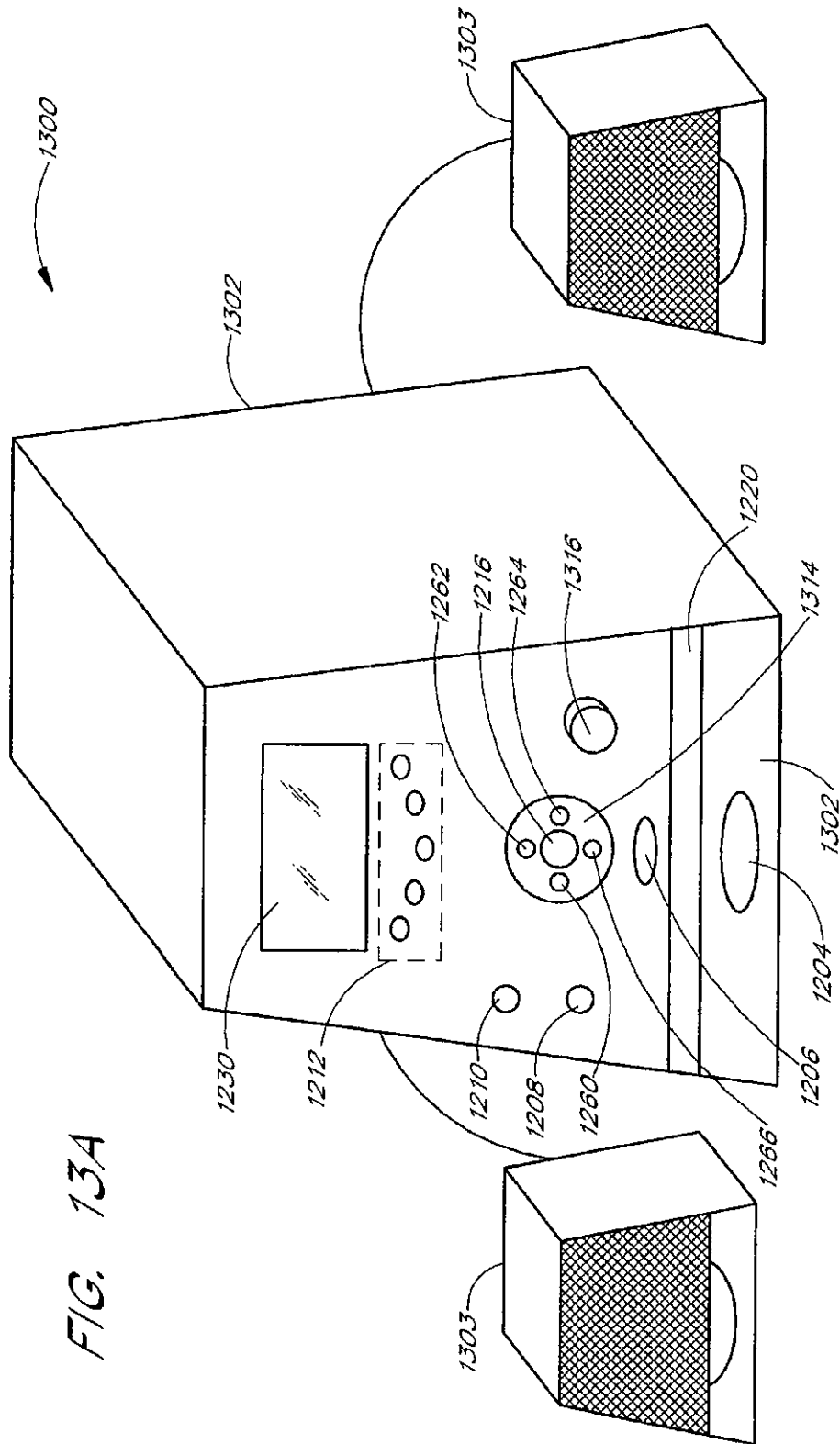


FIG. 13A

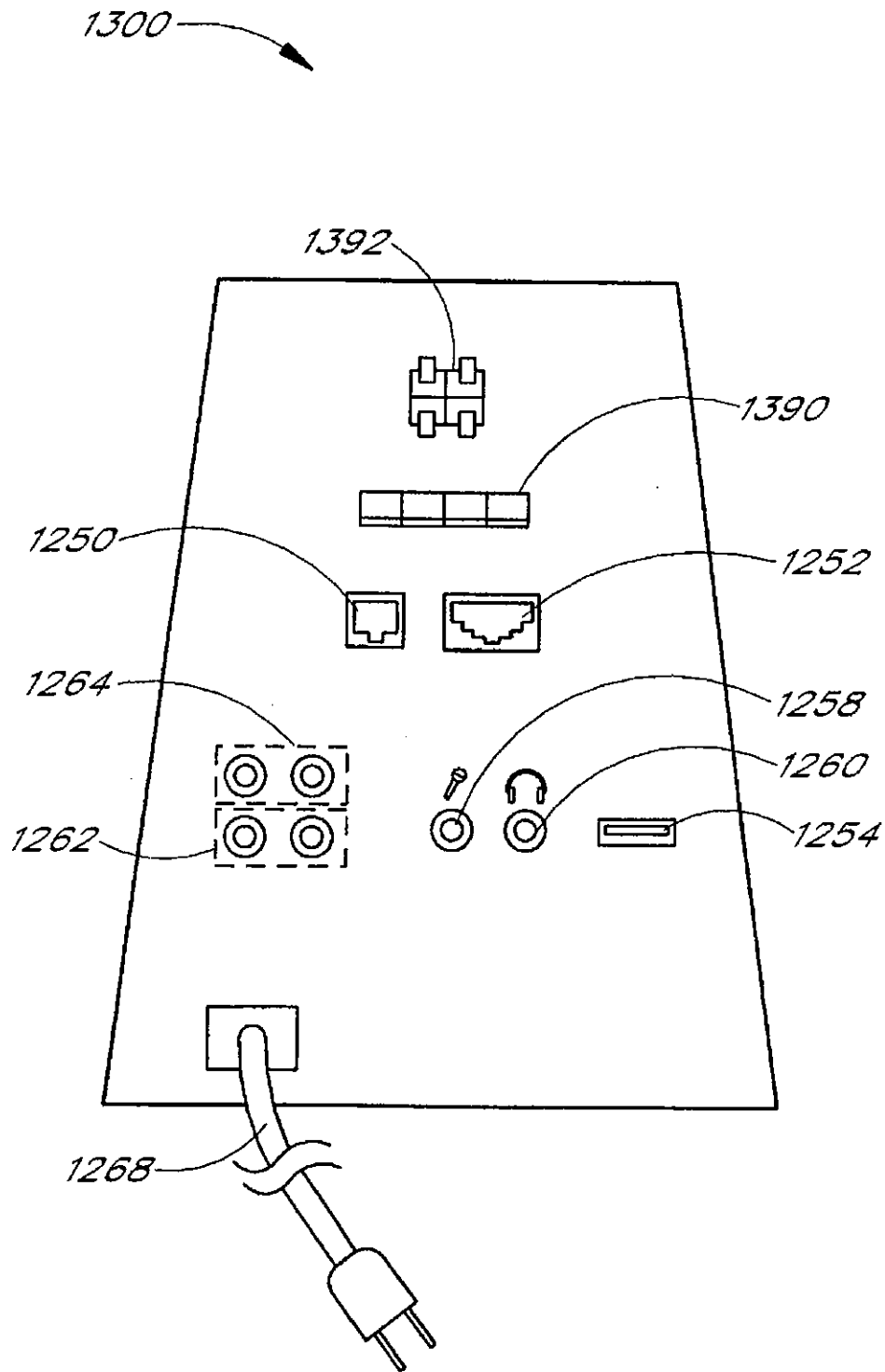


FIG. 13B

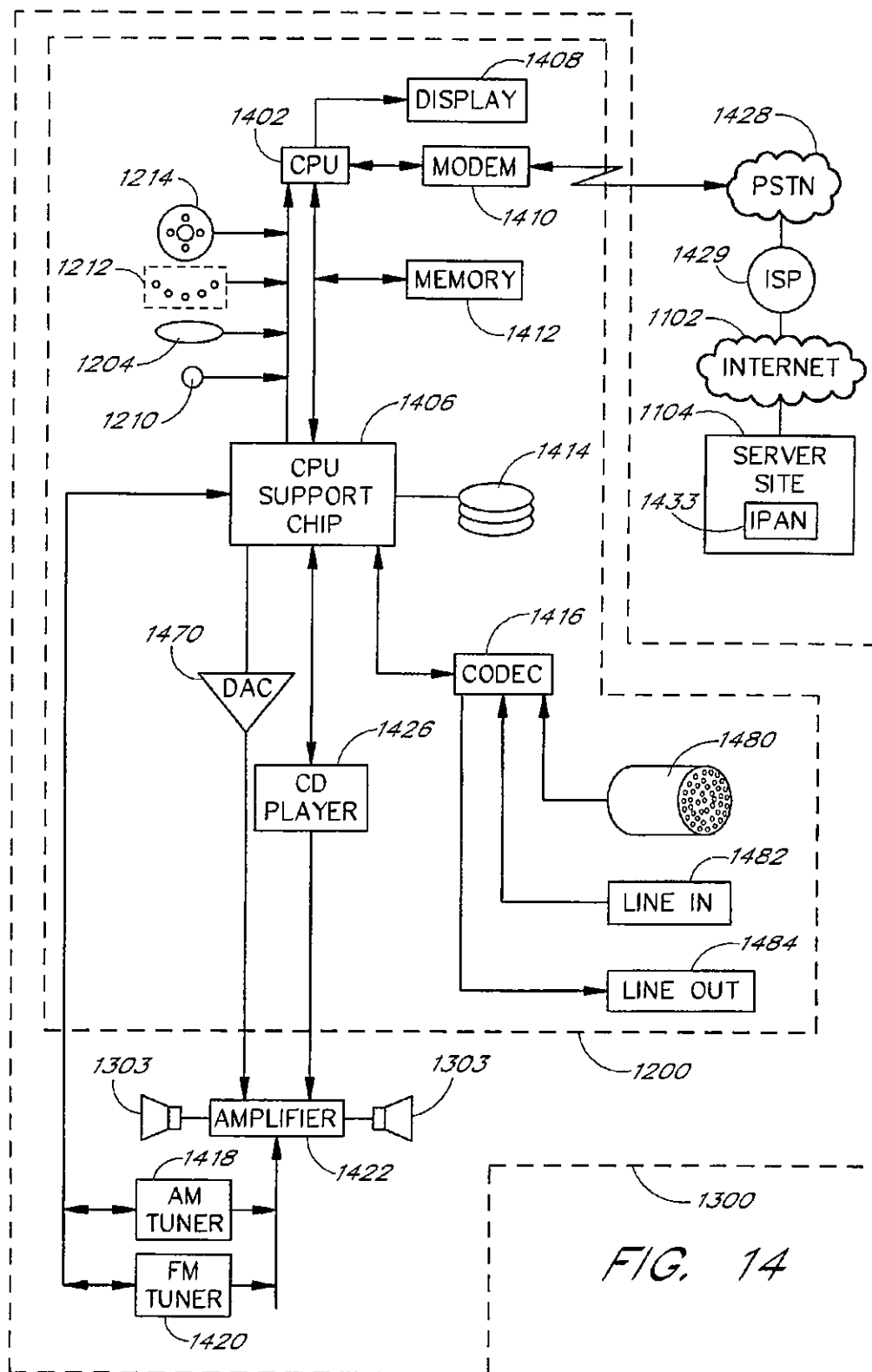


FIG. 14



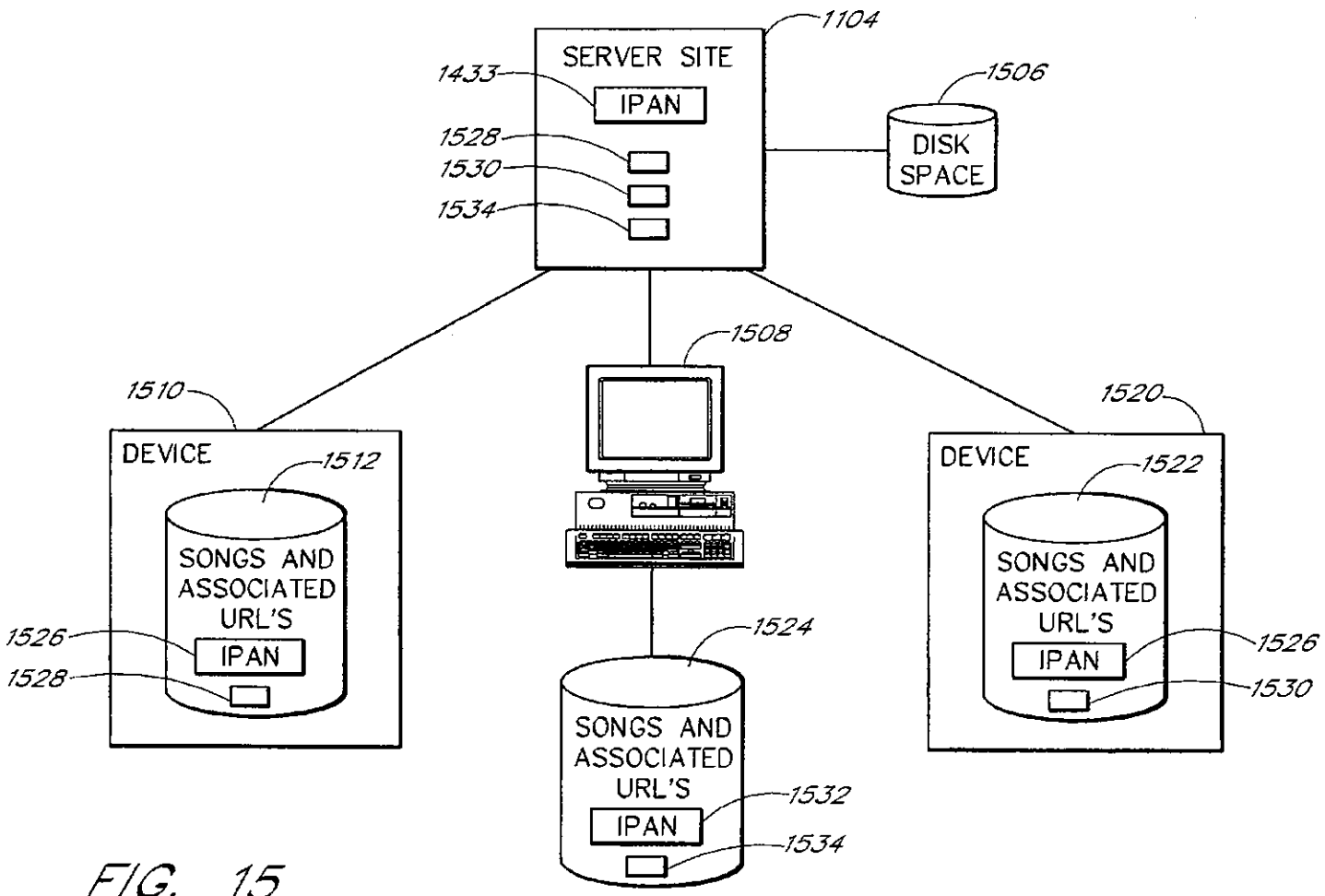


FIG. 15

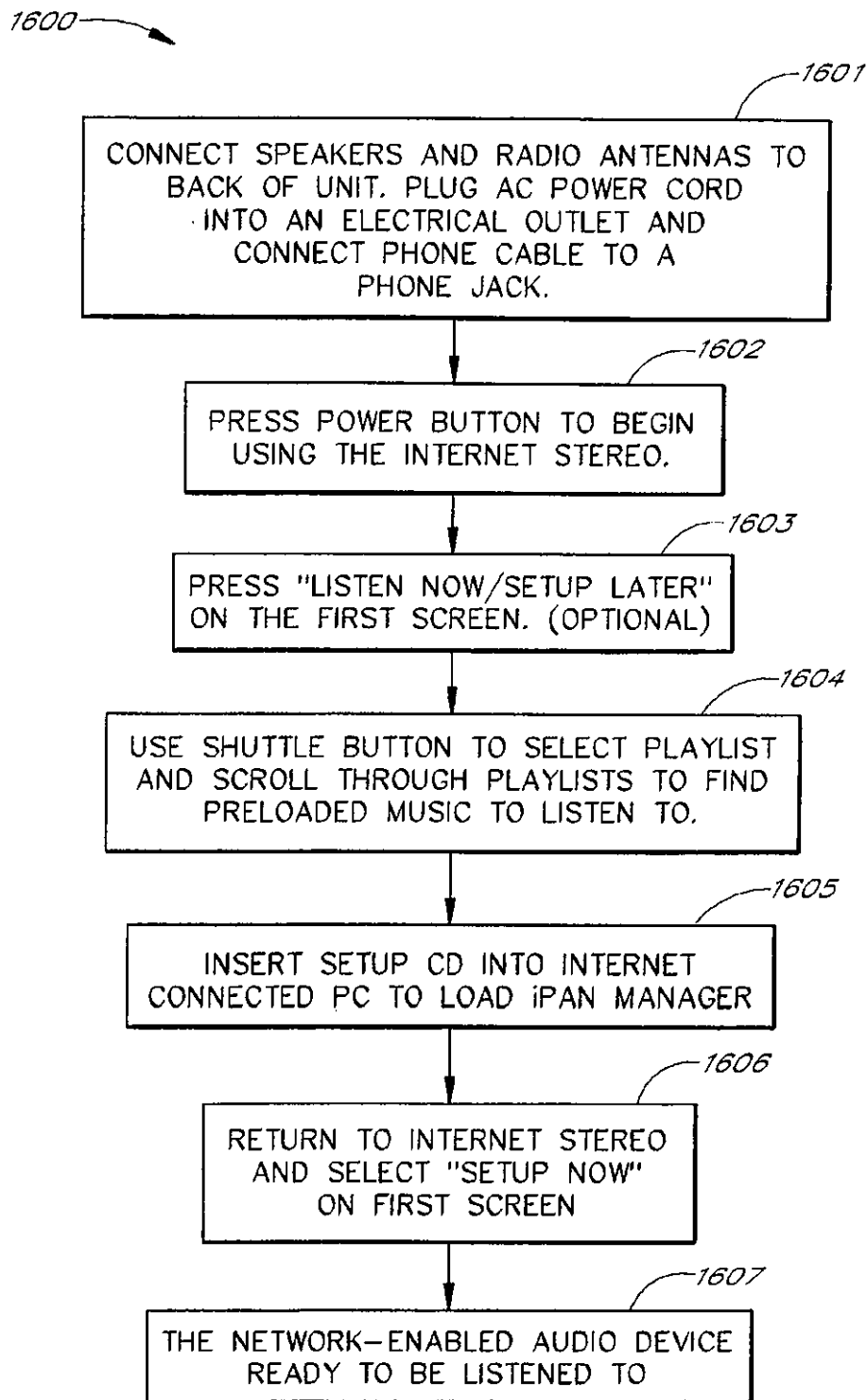


FIG. 16

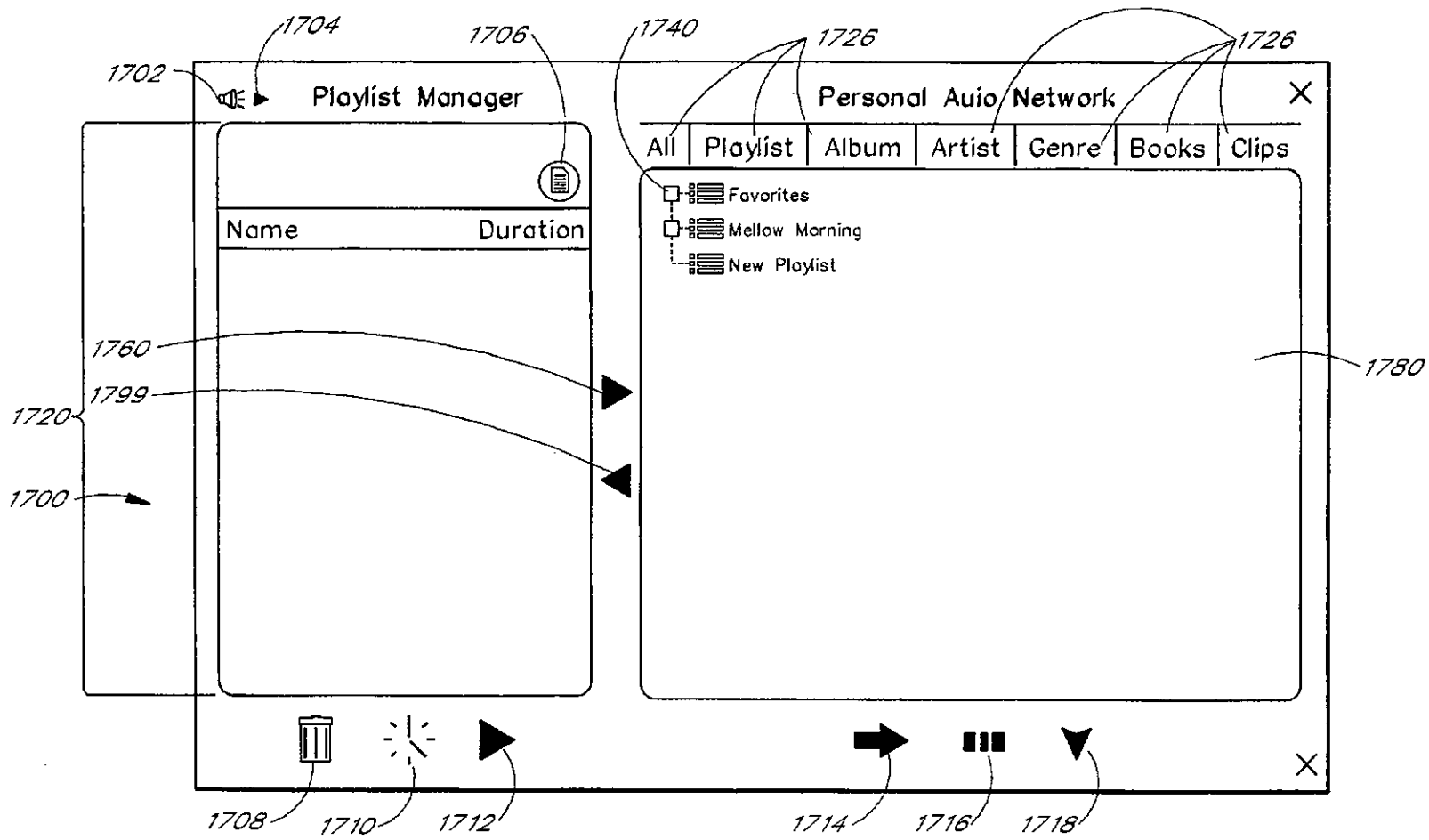


FIG. 17A

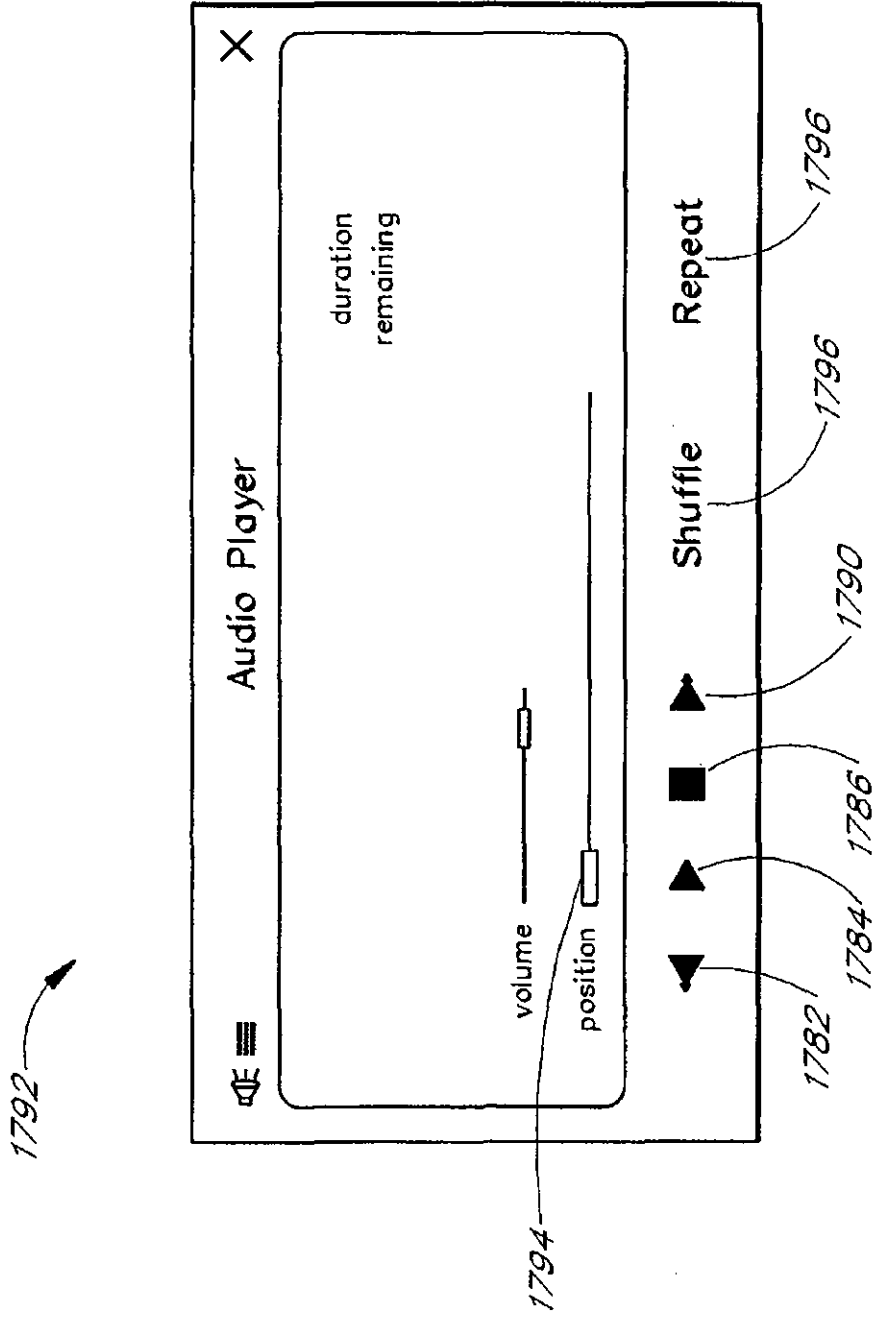
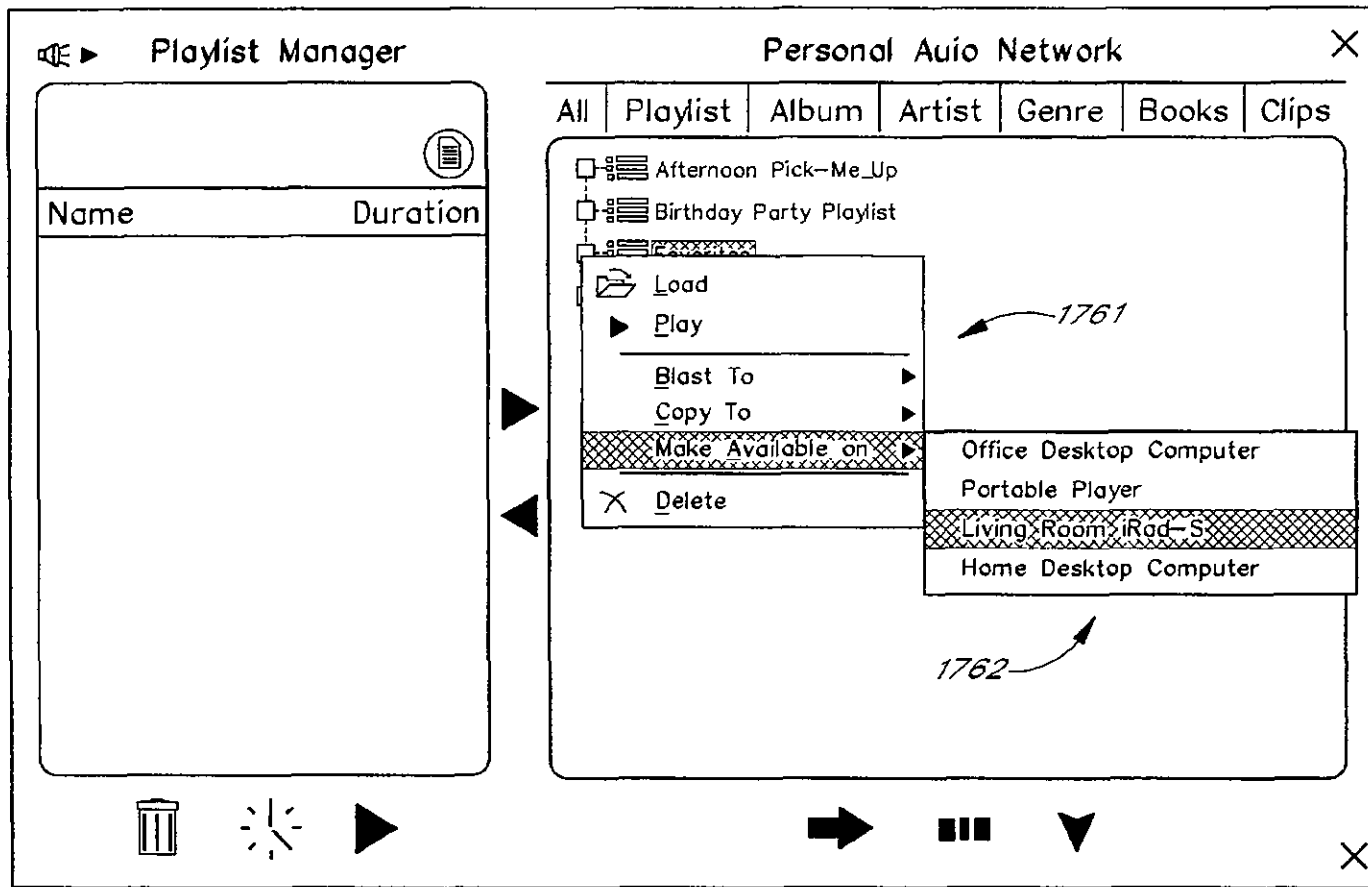


FIG. 17B



1700 →

FIG. 17C

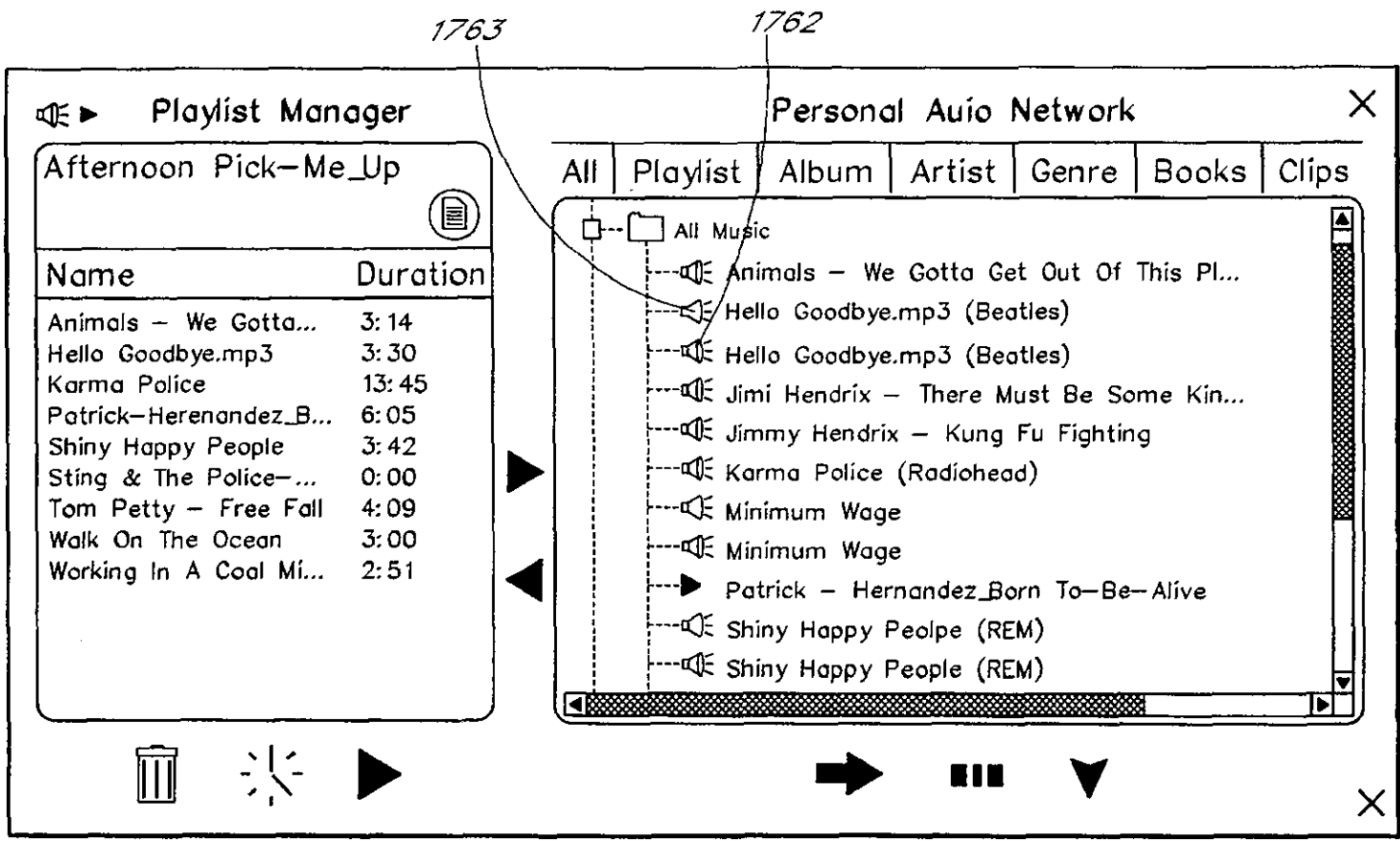


FIG. 17D

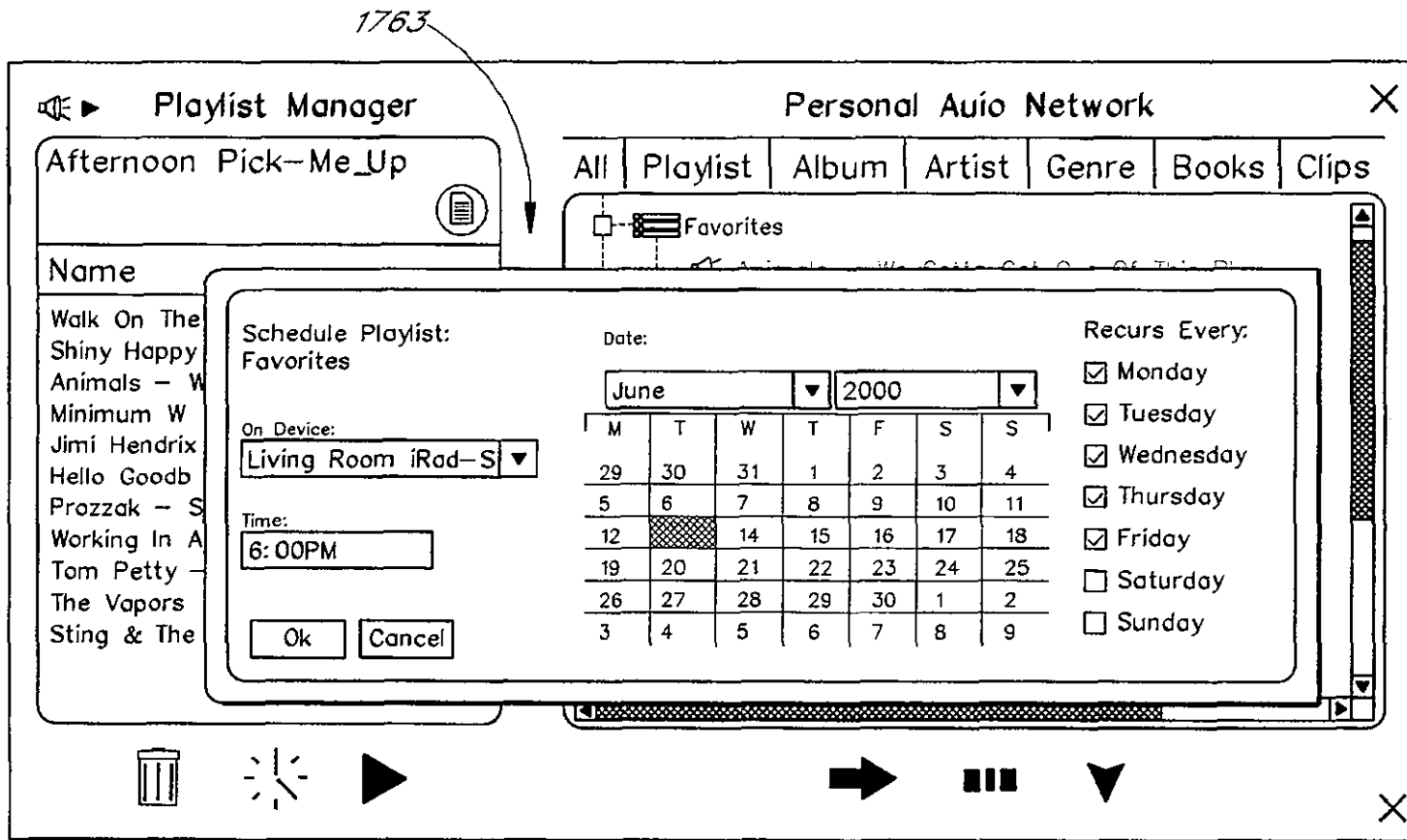


FIG. 17E

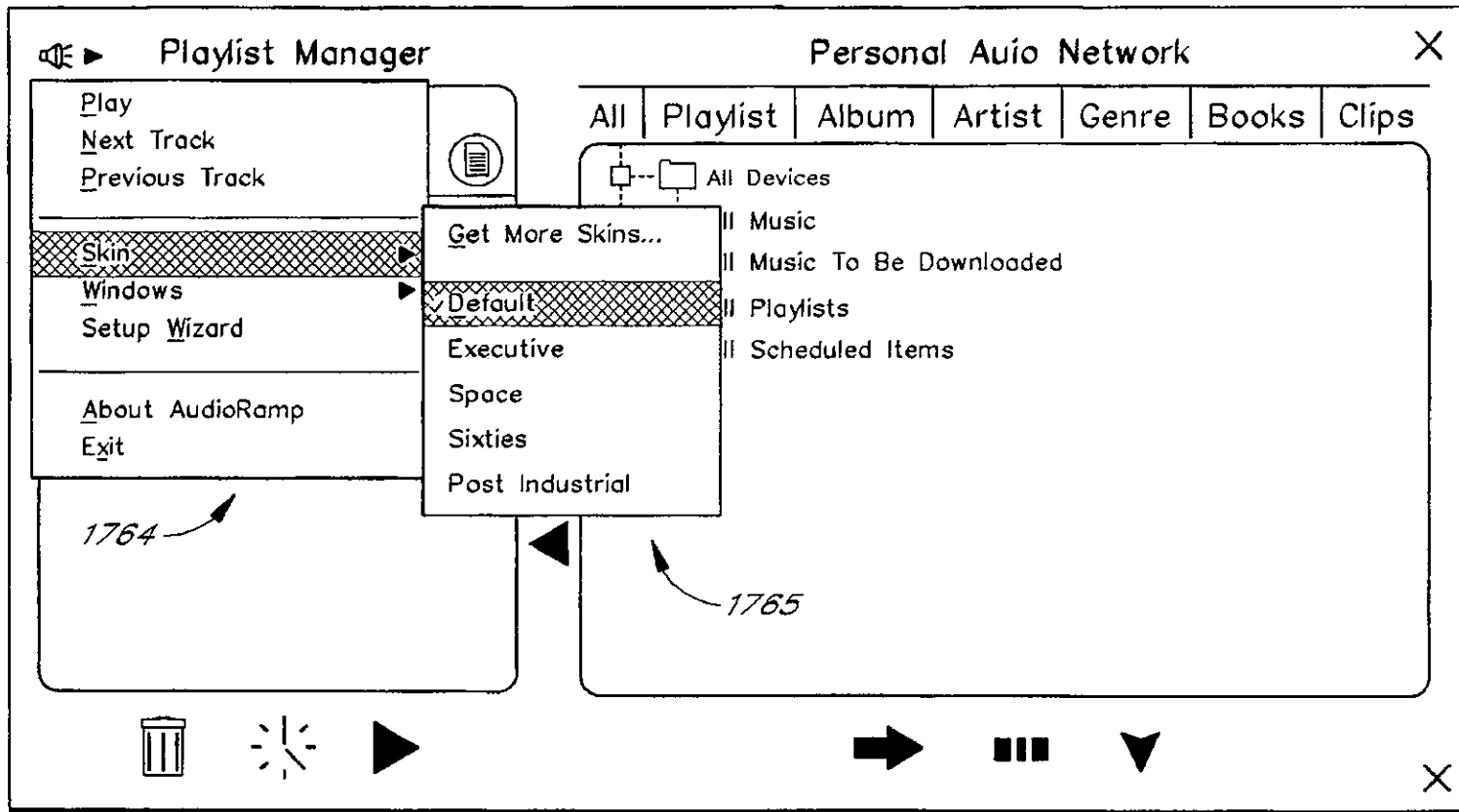


FIG. 17F



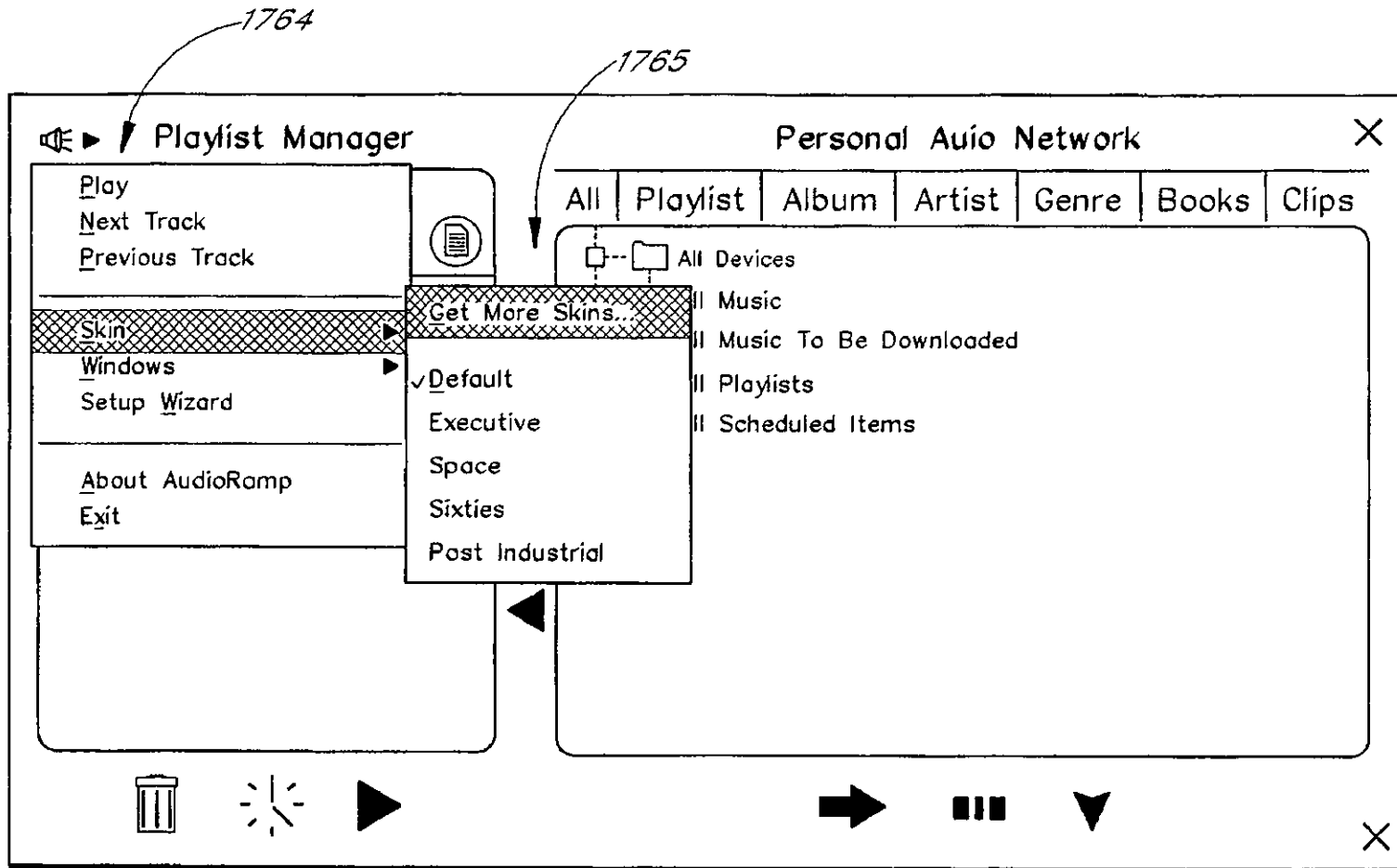


FIG. 17G

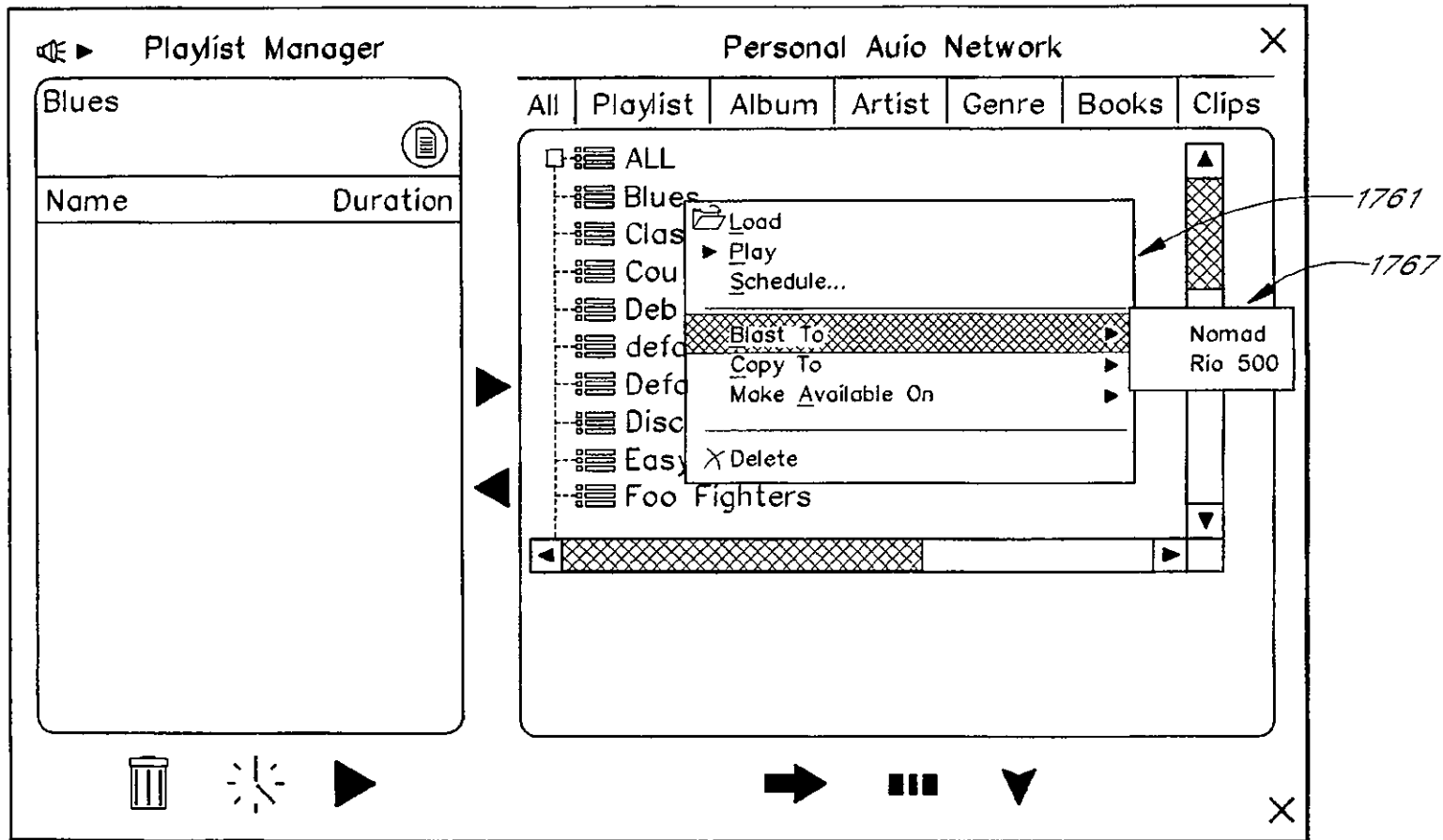


FIG. 17H

1793

1793

1771

1772

1773

1774

1775

1776

1778

1791

1792

Name Portable Player

Serial Number

Device Type Diamond Rio PMP500 ▼

Connected To My Personal Computer ▼

Download to this device by default

Download Time 1:00 AM

Download Duration 1.00

Download Folder C:\audio

Ok Cancel

FIG. 171

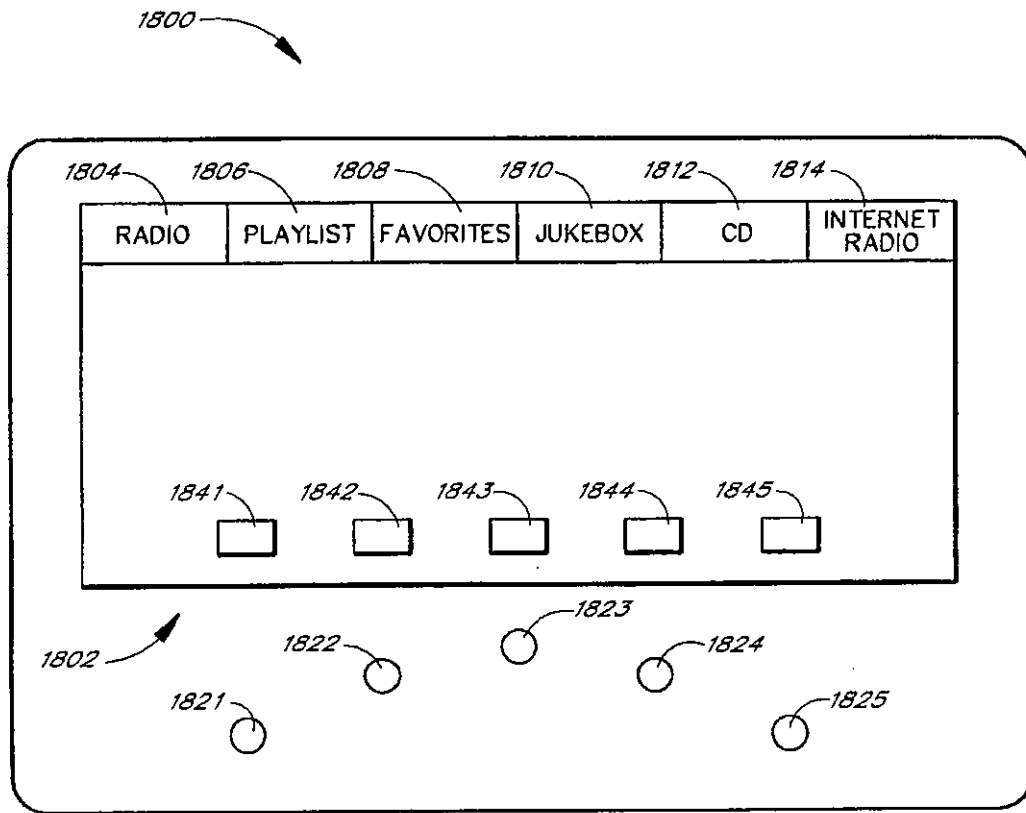


FIG. 18A

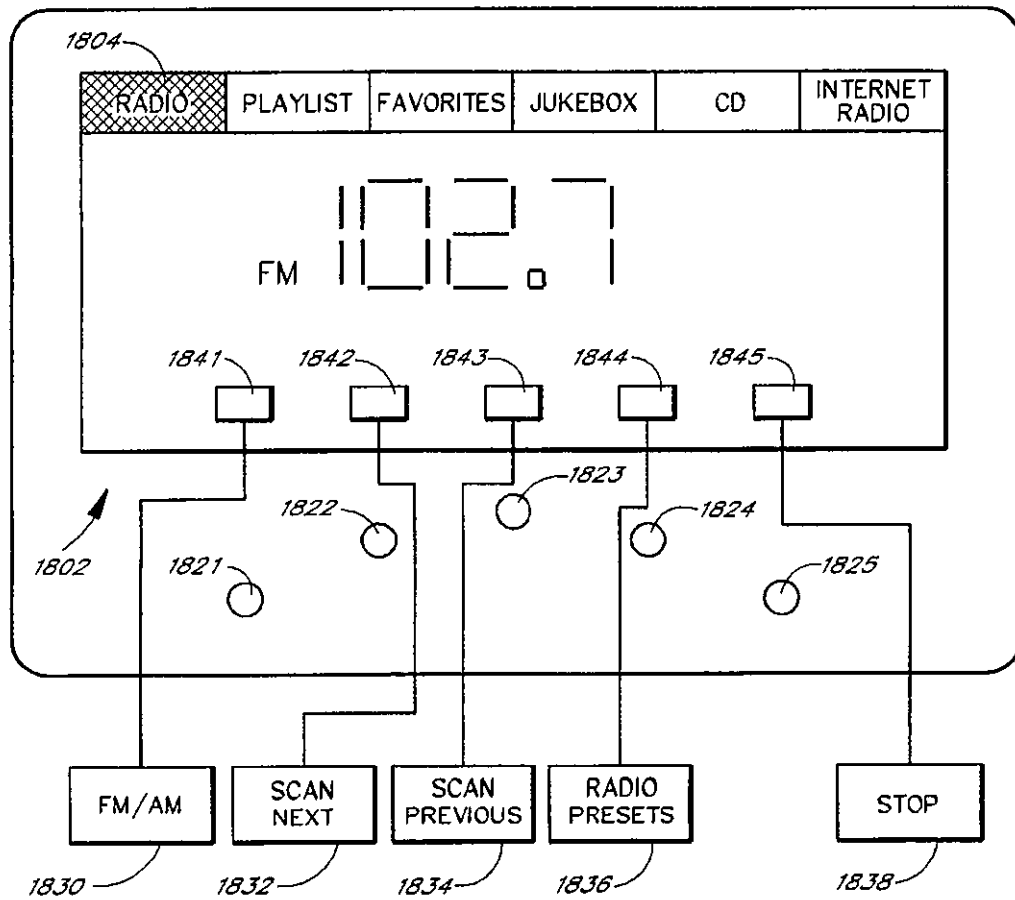


FIG. 18B

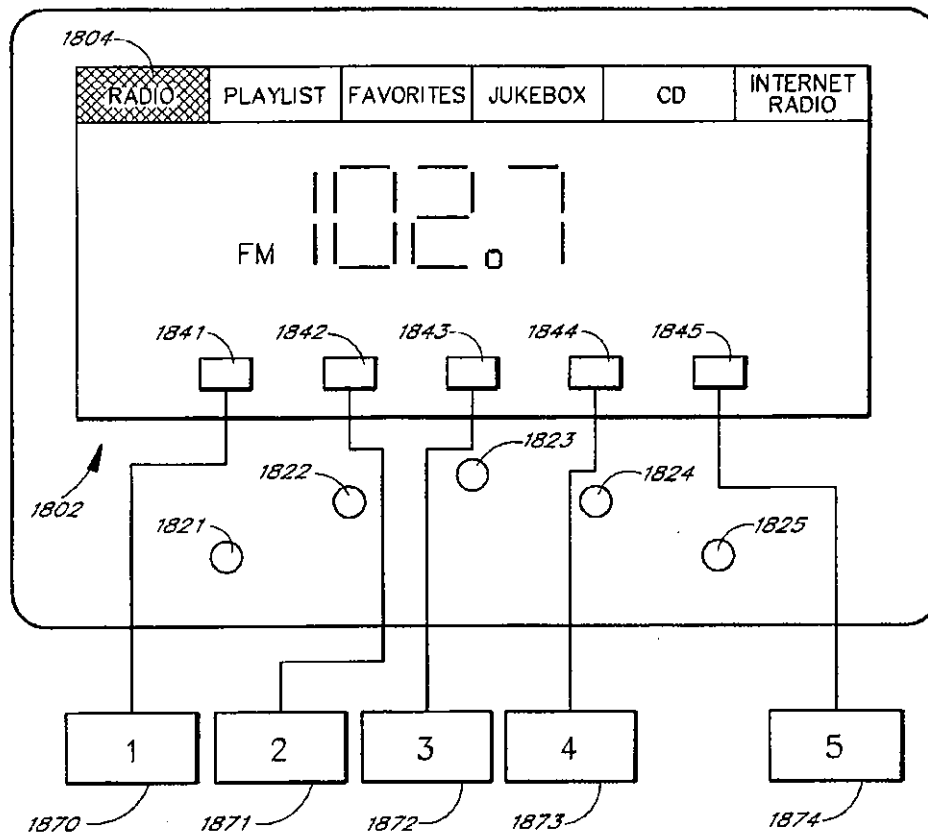


FIG. 18C

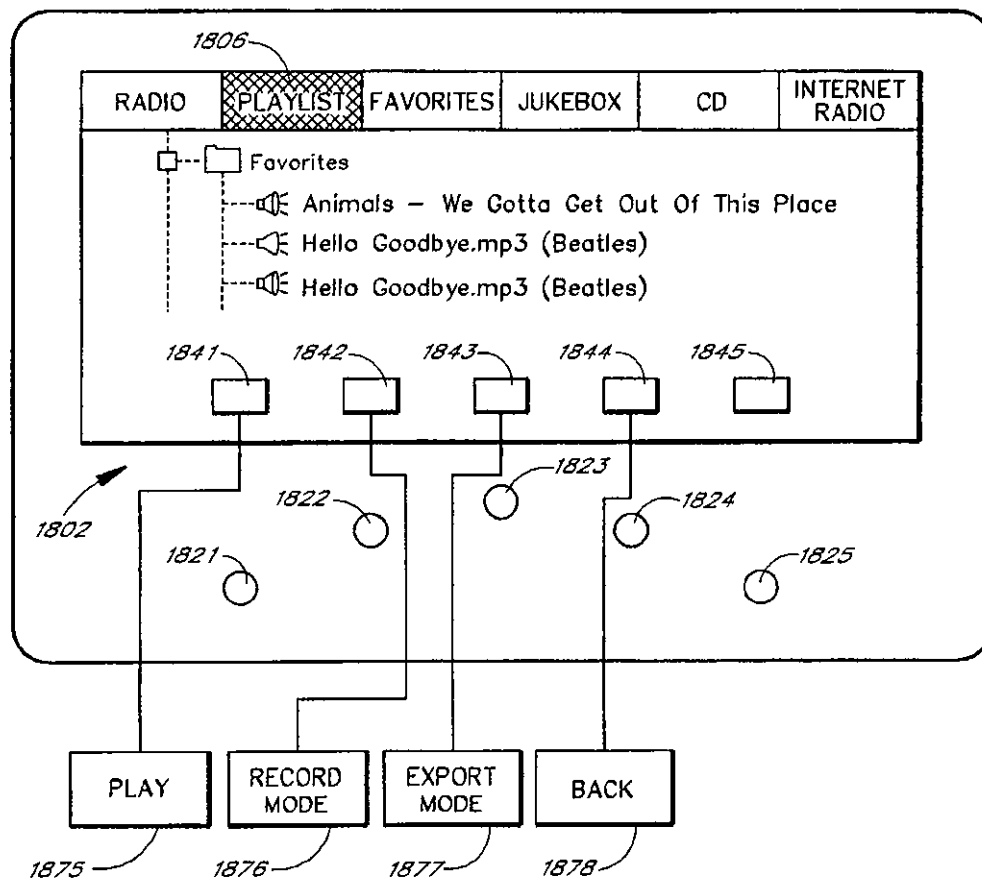


FIG. 18D

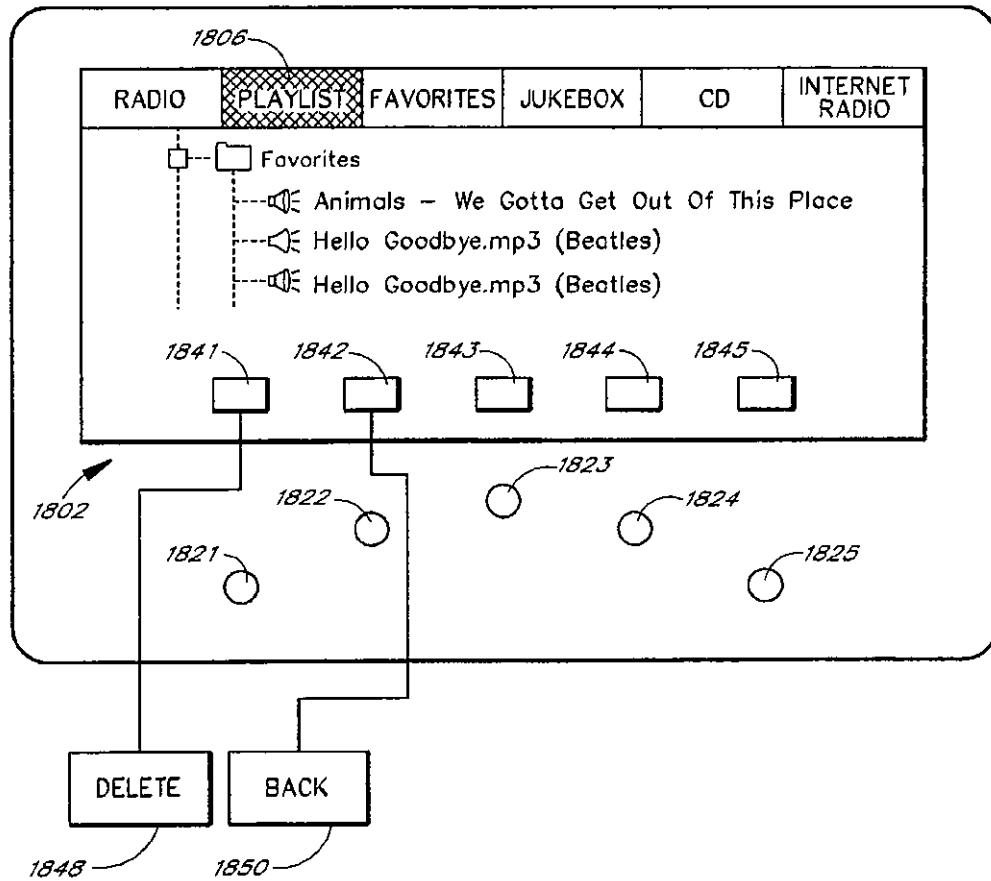


FIG. 18E



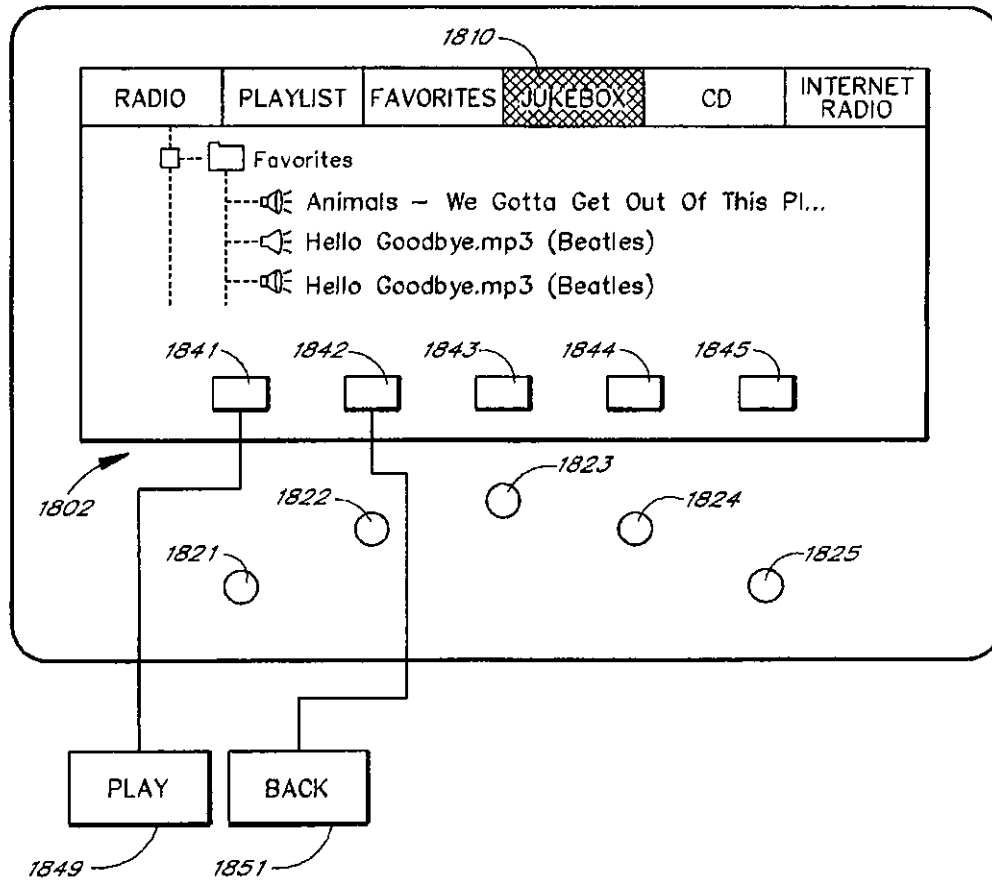


FIG. 18F

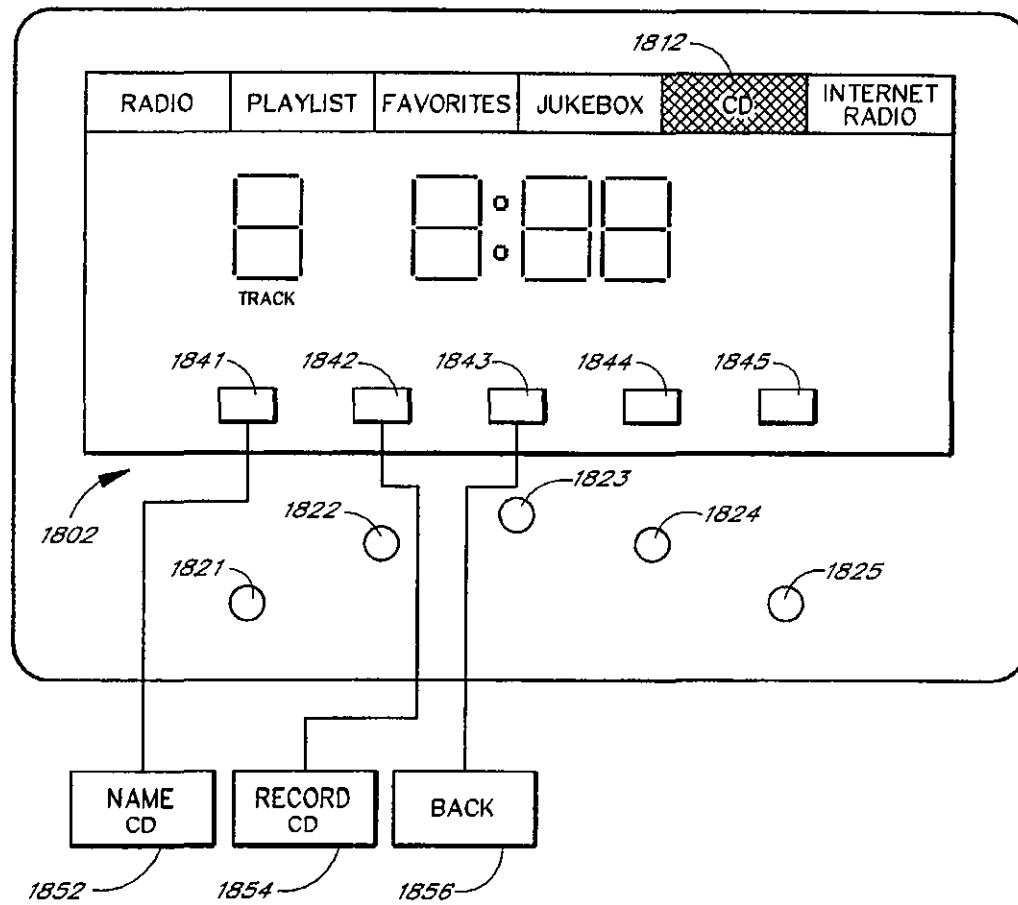


FIG. 18G

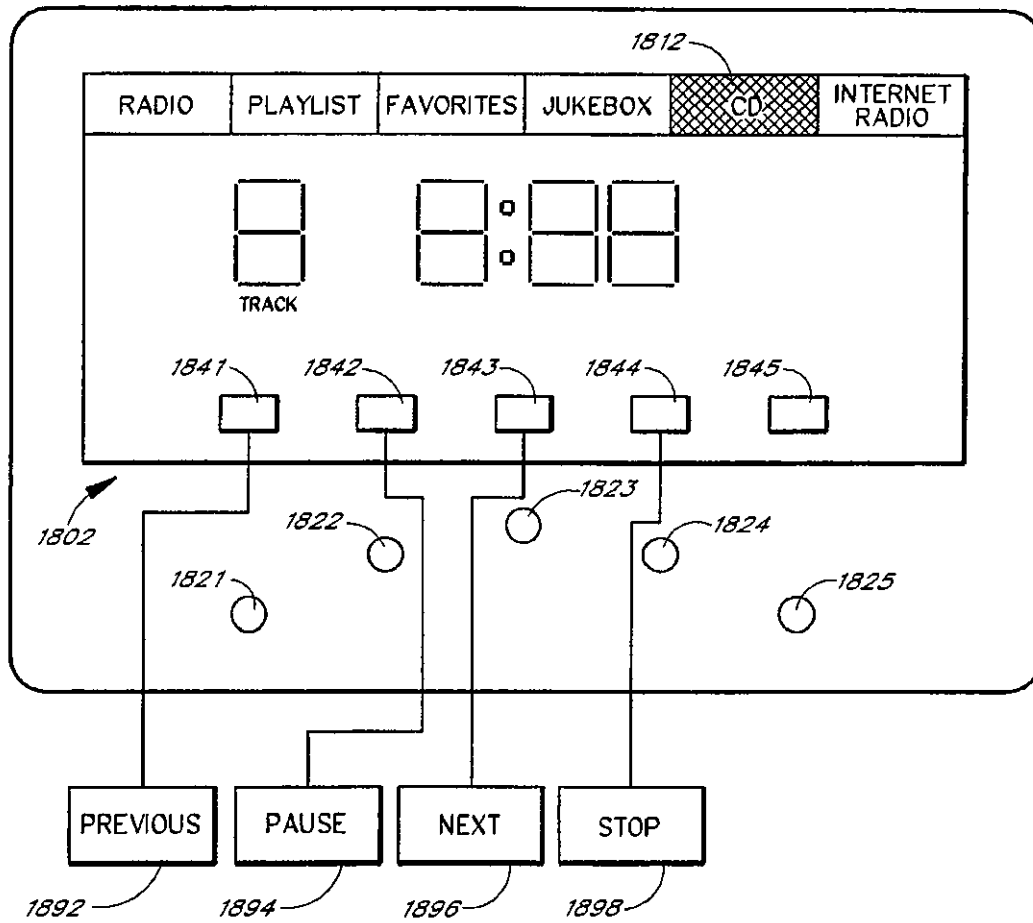


FIG. 18H

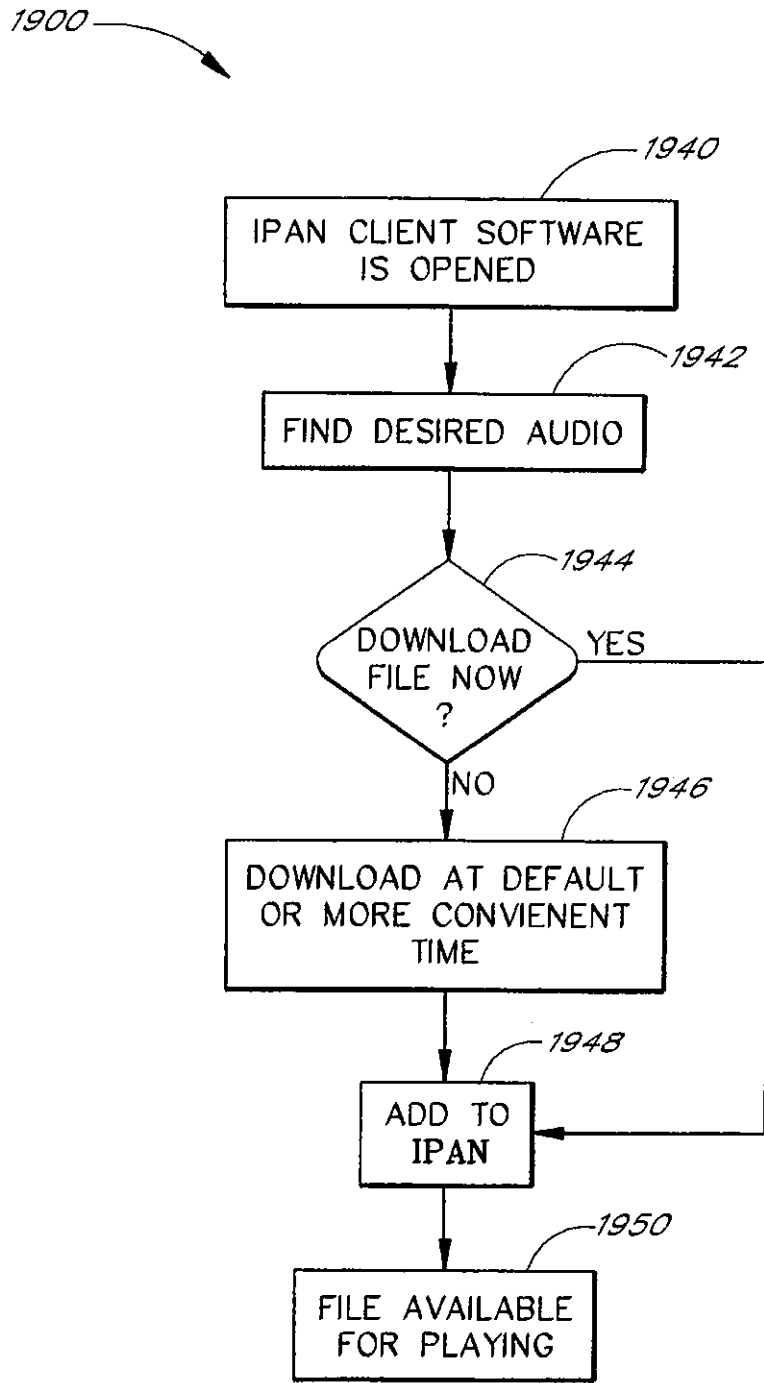


FIG. 19A

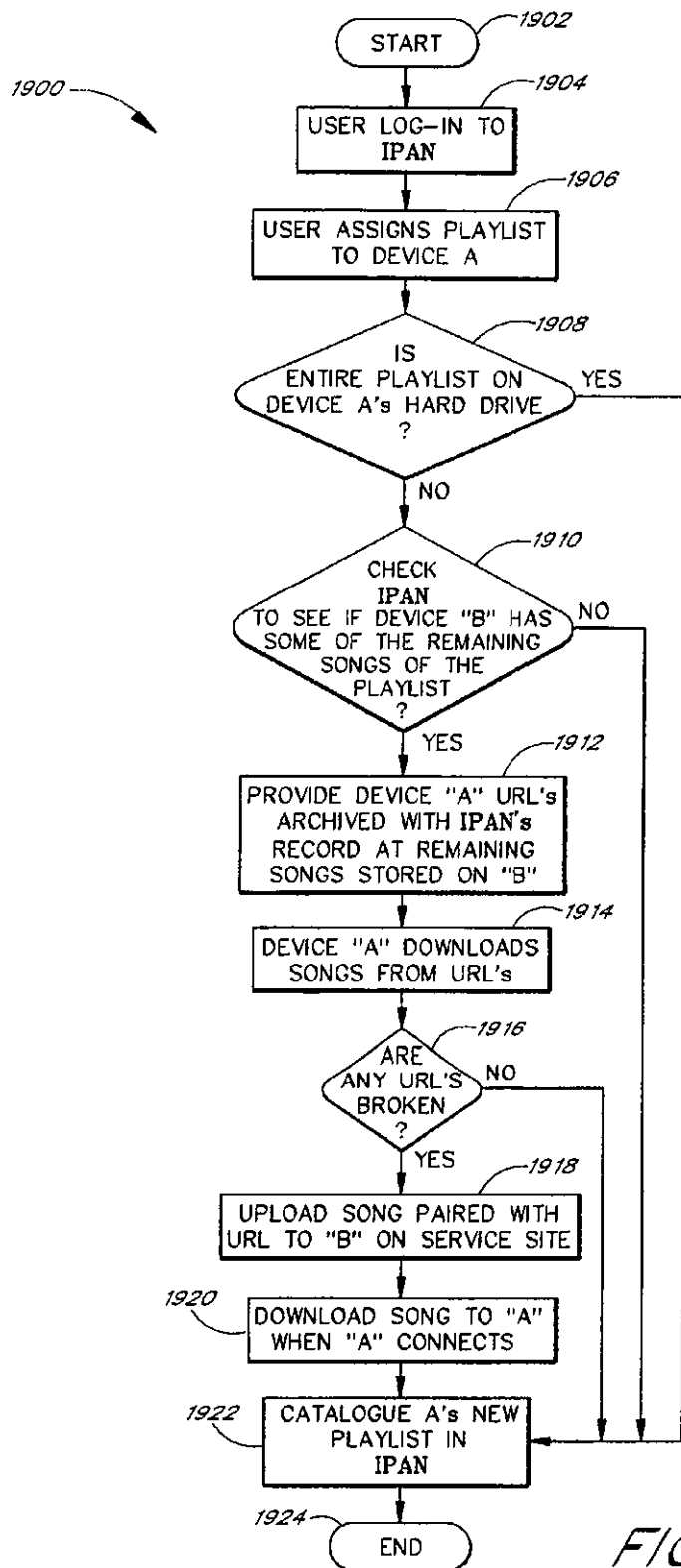


FIG. 19B

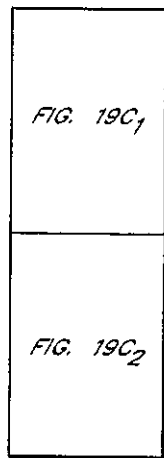
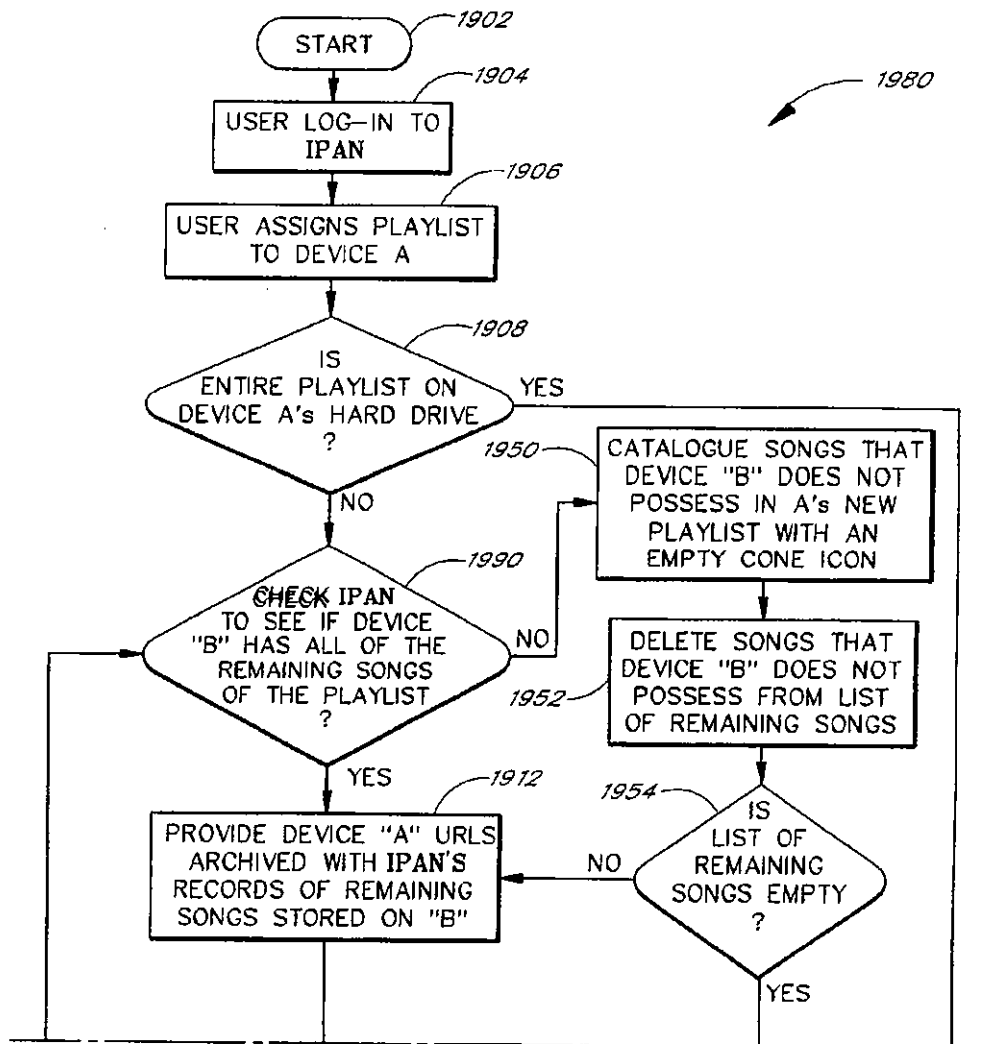


FIG. 19C

FIG. 19C<sub>1</sub>



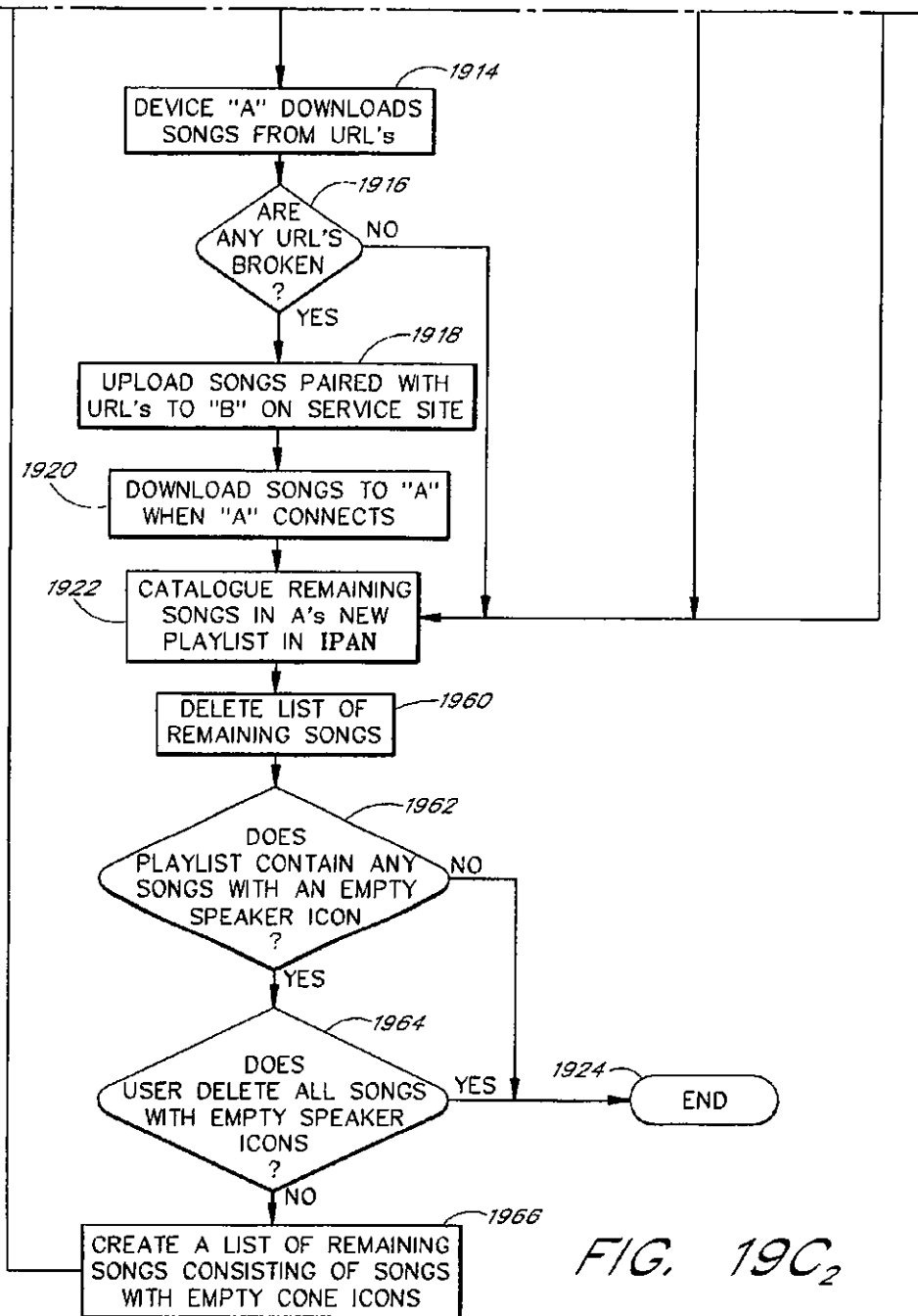


FIG. 19C<sub>2</sub>

1802 →

Unknown  
MP3  
02:58 / 05:43  
Pause    Next    Previous    Add Favorites    Stop



FIG. 20A



1802

Porcelain

Moby, Play

MP3

# Action

News Music Tour Offers Done

2002

- 1821
- 1822
- 1823
- 1824
- 1825

FIG. 20B

1802

Porcelain

Moby, Play

Action<sup>2004</sup>

**Music**<sup>2002</sup>

Albums    Similar    Samples    Back    Done

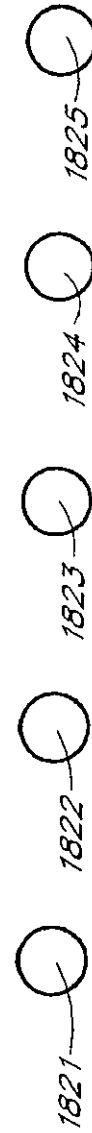


FIG. 20C

1802

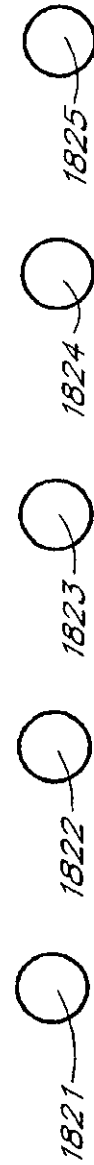
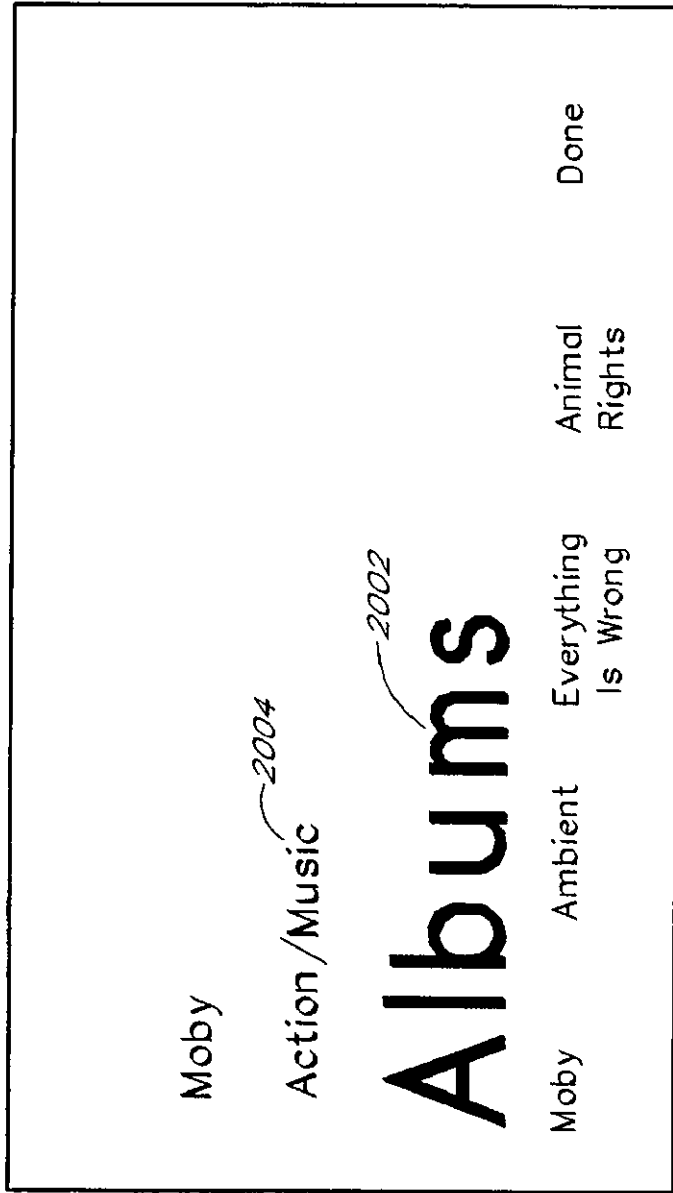


FIG. 20D

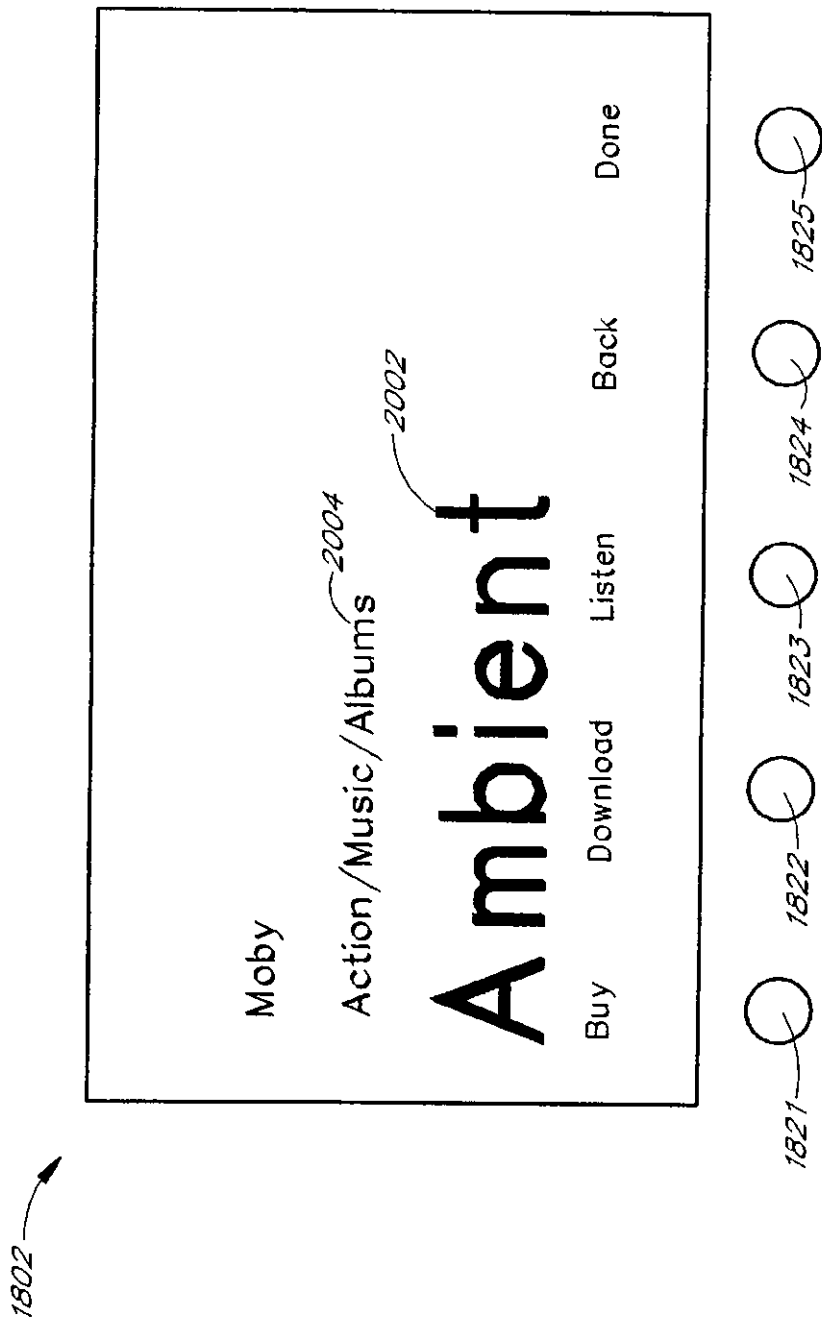


FIG. 20E

1802

Moby, Ambient  
Action/Music/Albums/Buy  
**Complete**  
Buy      Back      Done

2004

2002

- 1821
- 1822
- 1823
- 1824
- 1825

FIG. 20F

1802

Nike  
Radio Free Sydney, Air Max Knukini Offer  
MP3  
**Action**  
Buy      Log to MyActions      More Info      Offers      Done

2002

- 1821
- 1822
- 1823
- 1824
- 1825

FIG. 21

**METHOD AND DEVICE FOR AN INTERNET  
RADIO CAPABLE OF OBTAINING PLAYLIST  
CONTENT FROM A CONTENT SERVER**

RELATED APPLICATIONS

The present application is a continuation of U.S. patent application Ser. No. 09/805,470, filed Mar. 12, 2001, which is a continuation-in-part of U.S. patent application Ser. No. 09/096,703, filed Jun. 12, 1998, now abandoned, and which claims the benefit of U.S. Provisional Application No. 60/246,842, filed Nov. 8, 2000. U.S. patent application Ser. No. 09/096,703 also claims the benefit of U.S. Provisional Patent Application No. 60/072,127, filed Jan. 22, 1998. The disclosures of these previous applications are hereby incorporated by reference in their entireties.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the field of audio file transfers and, more particularly, relates to the field of management and distribution of audio files over a computer network such as the Internet.

2. Description of the Related Art

The Internet is a worldwide array of interconnected computers and information servers that allow anyone with a computer and access to the Internet to get information about virtually any subject 24 hours a day. For the average consumer, an Internet Service Provider (ISP) provides access to the Internet. ISPs such as CompuServe, Prodigy, and America On-Line, currently link over ten million users to the Internet. Users typically connect to the ISP by using standard telephone lines and a telephone modem. Cable modems that allow a user to connect to the ISP over cable television lines, and satellite connections to the Internet, are also available.

The Internet provides a wealth of information from stock reports to headline news. One of the newer services provided on the Internet is a streaming audio (e.g., RealAudio and MPEG audio) service. Streaming audio services are often provided in connection with the World Wide Web (Web) and thus are often called Web radio broadcasts. With streaming audio, a user with a Personal Computer (PC), a sound card, and the necessary software can listen to audio programs from anywhere in the world. For example, Radio Prague provides daily Internet broadcasts from the Czech Republic. Listeners in the U.S. can listen to these Web radio broadcasts either in real time, or stored for later replay. Thus, unlike more traditional radio broadcasts where the listener must be within a reception area, Web radio broadcasts can be heard anywhere, so long as the listener has a connection to the Internet and the necessary computer hardware and software.

Unfortunately, even with the ever-decreasing cost of personal computers, the hardware and software needed to listen to a Web radio broadcast is beyond the financial means of many people. Even for those that can afford a personal computer, listening to a Web radio broadcast ties up the computer so that the user cannot use it for other purposes. Moreover, the use of a personal computer to receive streaming audio (e.g., Web radio broadcasts) requires a certain amount of computer literacy on the part of the user. The user must be able to install the Web Radio software, configure the Web Radio software to communicate with the ISP, and find the various Web radio broadcasts provided on the Web.

In addition to listening to Web radio broadcasts, users may wish to listen to audio files. With a group of PC's in a home and in a network, users can download songs from one PC to

another or upload songs from one PC to another. However, users cannot play a song on one PC by using the controls of another PC. In addition, the users must purchase multiple PC's, which can be costly. Further, the user must be able to install the network connection and the appropriate software. Moreover, even if the user can afford to purchase multiple PC's and install the proper connection, the user would have difficulty playing music in addition to performing other tasks on the PC. For example, the Web radio broadcast may be interrupted. Also, a skip over parts of a song may result if the user is using a word processing program at the same time as listening to music.

SUMMARY OF THE INVENTION

The present invention solves these and other problems by providing a network-enabled audio device for listening to a variety of audio sources with substantially equal convenience. The network-enabled audio device has a visual display for providing audio source choices to a user. The visual display also provides functions for managing audio sources. User control buttons allow a user to choose an audio source to listen to. The menu buttons allow the user to choose functions for managing the audio sources. In one embodiment, there is also tuner circuitry for receiving radio frequency signals from radio broadcast stations. In one embodiment, a CD player allows the user to listen to CD's. In one embodiment, the network-enabled audio device also has one or more audio amplifiers and one or more loudspeakers operably connected to said audio amplifiers. In one embodiment, a modem is used for transmitting and receiving digital data over a communications network. One embodiment includes a data storage device.

A first software module is stored on the data storage device, and the software module is configured to decode compressed audio files into a playable (e.g. uncompressed) format. A second software module is also stored on the data storage device. The second software module is configured to use the modem to connect to an Internet service provider to receive assignments of playlists from a third software module. The playlists include references to audio from a variety of audio sources. The assignments provide information about the location of other web sites containing the audio sources. The second software module is configured to subsequently connect through an Internet service provider to web sites to download audio files.

A third software module is also stored on the data storage device. The third software module is configured to use the modem to connect to an Internet service provider to receive digitized audio broadcasts from the Internet service provider. The module is further configured to provide a select-broadcast display to allow the user to selectably connect a program broadcast to the input of one or more audio amplifiers either from a local AM or FM radio station or from the world wide Web so that, to the user, reception of a broadcast from the World Wide Web is no more complicated than listening to a local FM or AM radio station.

One aspect of the present invention is a network-enabled audio device that allows a user to store files, to play standard audio CD's, to play MP3 encoded CDs, to record songs from CD's, to receive digitized radio broadcasts over the World Wide Web (Web), and to receive assignments of playlists of songs from other network-enabled audio devices. The network-enabled audio device provides the hardware and software to perform those functions without the need for expensive equipment. Optionally, a Local Area Network can be configured in place of, or in addition to, the Internet connec-

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tion to facilitate assignments of playlists and other features. Without an Internet connection or other network connection, the network-enabled audio device can play standard audio CD's, can play MP3 encoded CD's, and can record CD's.

The network-enabled audio device provides a display device, such as a Liquid Crystal Display (LCD) that allows the user to select playlists of music much like a jukebox. The user can compose playlists from disk files, CD's, Internet streaming audio broadcasts, online music sites, and other audio sources. In one embodiment, the user can also compose playlists from links to AM/FM broadcasts. The user can also select a desired Web broadcast from a list of available Web broadcasts. In addition, the user can play standard audio CD's and MP3 encoded CD's and have access to local AM/FM stations. Further, the software, the user controls, and the display in the network-enabled audio device are operably configured and connected such that the user can listen to playlists that include CD's and other audio sources just as the user would choose a playlist in a jukebox. Thus, the network-enabled audio device provides people who are or are not comfortable with computers a way of taking music from various sources and putting it into one place for listening pleasure. In one embodiment, the Personal Computer (PC) is used to compose the playlists, but the user is able to listen to playlists and other audio sources without using the PC.

In one embodiment, the network-enabled audio device is a low-cost tabletop box that connects to an AC power line and optionally to a phone line or to a local area network connection such as Ethernet. The device includes a display device, speakers, a control panel, a computer processor, stored software, a modem, an AM/FM tuner, and a CD player. Optionally, the device can include multiple computer processors or support computer processors. The user accesses the server site via a PC and the Internet. From the server site, the user obtains a list of the devices in his or her Internet Personal Audio Network (IPAN) and what songs are on those devices. The IPAN includes an IPAN server, an IPAN client, and IPAN software stored on the network-enabled audio device. In one embodiment, the IPAN client includes a standard web browser, an IPAN plug-in to the standard web browser, and an IPAN active tray software module. In one embodiment, any standard web browser may be used, but the IPAN client includes the IPAN plug-in and the IPAN active tray software module.

The IPAN client and the IPAN server store the name of the song and the associated Uniform Resource Locator (URL). The user can list multiple devices as being part of his or her IPAN. At a default time, such as for example 2 a.m., each device establishes a connection to an Internet Service Provider (ISP). The stored software module in each device connects to the server site home page, via the ISP, and inquires whether any songs or playlists have been assigned to the device. The user can bypass the default time for accessing the server and access the server by manually pressing one of the buttons.

In one embodiment, the network-enabled audio device has no disk for data storage space. Rather, a local area network (LAN) connection to a PC or other network-enabled audio device allows the use of disk space on another device. In one embodiment, the network-enabled audio device comprises speakers, an AC power line, and a network line. A home PC is connected to the network-enabled audio device through the network line. The network connection can be a Home Phone-line Networking Alliance (HPNA) network connection so that the connection may be done through existing phone lines in a home. Optionally, the network connection can be an

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Ethernet connection. Multiple network-enabled audio devices can be connected to each other and ultimately to the PC through the network line.

In one embodiment, the network-enabled audio device does not have any storage space other than memory. This embodiment provides for a low-cost system that can play songs from playlists stored on the IPAN Manager or on the PC's storage space without having to store the audio files locally.

Another aspect of the present invention is a network-enabled component audio device system for listening to a variety of audio sources with substantially equal convenience. A visual display provides audio source choices to a user. The visual display also provides menu choices for managing audio sources to the user. The user control buttons allow the user to choose an audio source to listen to. The menu buttons allow the user to choose functions for managing the audio sources. The network-enabled component audio device has a CD player for listening to compact discs. A modem is used for transmitting and receiving digital data over a communications network. In one embodiment, a data storage device is provided.

A first software module is configured to decode compressed audio files. The first software module is stored on the data storage device. A second software module is configured to use the modem to connect to an Internet service provider to receive assignments of playlists from the second software module. The playlists include titles of audio from a variety of audio sources. The assignments provide information about the location of other web sites containing the audio sources. The software module is configured to connect through the ISP to the web sites to download the audio files.

In one embodiment, the network-enabled audio device is a component hardware device for an audio system. The network-enabled audio device provides an audio output to the audio system. The audio system provides amplifiers and loudspeakers. The network-enabled audio device includes an enclosure that connects to an AC power line, a network line, and the audio system. The network line is a computer data connection, such as, for example, a telephone line, a cable line, an Ethernet line, a Token-Ring line, a twisted pair line, an infrared link, a radio frequency link, an IEEE 1394 FireWire line, etc. The network-enabled audio device includes a display device, a control panel, at least one computer processor, a stored software module, and a modem. In one embodiment, the network-enabled audio device connects to the IPAN server site.

Another aspect of the present invention is a method for assigning playlists of music from one electronic device to another. First, a network connection is used for transmitting and receiving digital data over a communication network to an Internet service provider. Next, the process provides a first software module to manage playlists of songs. The software module allows a user to compose playlists from a variety of audio sources. The software module allows a user to assign a playlist from a first device to a second device. Next, the process checks the second device's data storage space for songs listed on the assigned playlist. Next, the process accesses a server site to obtain locations of the web sites the first device downloaded its audio files from. The process then provides a second software module to connect to various web sites to download remaining songs needed for the playlist. The second software module connects if songs needed to form the playlist are not stored on the second device's data storage space. Finally, the process uploads files to the server



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from the first device and downloads files the second device if the second software module is unable to download a file from said web site.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The various novel features of the invention are illustrated in the figures listed below and described in the detailed description that follows.

FIG. 1 is a perspective view of one embodiment of a tabletop intelligent radio apparatus.

FIG. 2 is a block diagram of the functional elements of the intelligent radio apparatus.

FIG. 3A shows a default display that appears while a Web broadcast is being received.

FIG. 3B shows a menu display that allows the user to select one of the command and setup displays shown in FIGS. 3C-3E.

FIG. 3C illustrates a select language display that allows a user to specify desired languages (e.g., English, French, etc.).

FIG. 3D illustrates a display that allows a user to select a type of program material (e.g., news, sports, weather, etc.).

FIG. 3E illustrates a display that allows a user to select various program broadcasts.

FIG. 4 illustrates a data-entry display that the intelligent radio apparatus uses to allow the user to input alphanumeric text.

FIG. 5 is a flowchart that illustrates operation of the intelligent radio apparatus.

FIG. 6 is a flow graph that illustrates operation of the intelligent radio networked system.

FIG. 6A illustrates the information management and data processing functions provided by a Web radio Web site (e.g., www.webradio.com) to produce a list of Web radio broadcast stations for the user.

FIG. 6B illustrates a relationship between the Web radio Web site and other web sites that provide streaming audio programming.

FIG. 7 is a perspective view of a tabletop intelligent radio tuner.

FIG. 8 is a block diagram of the functional elements of the intelligent radio tuner shown in FIG. 7.

FIG. 9 is a block diagram of the functional elements of an embodiment of the intelligent radio that provides a remote playback capability.

FIG. 10 is a block diagram of the functional elements of an embodiment of the intelligent radio that provides a remote access capability.

FIG. 11 is a perspective view of one embodiment of the computing environment of a network-enabled audio device configuration.

FIG. 12A is a perspective front view of one embodiment of the network enabled component audio device as shown in FIG. 11 that integrates with a home stereo entertainment system.

FIG. 12B is a perspective rear view of one embodiment of the network-enabled component audio device as shown in FIG. 11 that integrates with a home stereo entertainment system.

FIG. 13A is a perspective front view of one embodiment of a stand alone network-enabled audio device as shown in FIG. 11.

FIG. 13B is a perspective rear view of one embodiment of a stand alone network-enabled audio device as shown in FIG. 11.

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FIG. 14 is a block diagram of the functional elements of the network-enabled audio device as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 15 is a block diagram illustrating the configuration between several network-enabled audio devices and a stereo web site as shown in FIG. 11.

FIG. 16 illustrates a process for connecting the components and setting up the software for the network-enabled audio device as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 17A shows a default display of the current playlists when the Internet Personal Area network (IPAN) manager software is started.

FIG. 17B illustrates a display that allows the user to control the sound and perform other functions on the audio source.

FIG. 17C illustrates the menus used to assign a playlist, as shown in FIG. 17A, to another device.

FIG. 17D illustrates the songs within a playlist and links to other devices that have the songs present on their hard disk space.

FIG. 17E illustrates a schedule window that appears for a song (shown in FIG. 17D) to be played at a particular time on a specific device.

FIG. 17F illustrates the window that appears to allow the user to choose a default look and feel for the IPAN manager window, as shown in FIG. 17A.

FIG. 17G illustrates the window that appears to allow the user to choose other options and the look and feel for the IPAN manager window, as shown in FIG. 17A.

FIG. 17H illustrates the window that appears to allow the user to move audio files from one device to another device.

FIG. 17I shows a display for allowing a user to add a device to the IPAN.

FIG. 18A shows a default display of the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18B shows a display for allowing a user to operate the radio functions of the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18C shows a display for allowing a user to use preset radio stations of the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18D shows a display for allowing a user to play a playlist stored on the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18E shows a display for allowing a user to delete a song from a playlist stored on the network-enabled audio device, as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18F shows a display allowing a user to play the songs from all the playlists stored on the network-enabled audio device as shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18G shows a display for allowing a user to collect information about a CD and copy a CD to the internal hard drive of the network-enabled audio device shown in FIGS. 12A, 12B, 13A, and 13B.

FIG. 18H shows a display that allows a user to play and navigate through the audio stored on the CD.

FIG. 19A is a flowchart showing the process for downloading audio files found when navigating the Internet.

FIG. 19B is a flowchart showing the process for assigning playlists from one device to another.

FIG. 19C, which comprises FIG. 19C<sub>1</sub> and FIG. 19C<sub>2</sub>, is a flowchart of the process shown in FIG. 19B that assigns playlists with missing songs from one device to another.

FIG. 20A shows a default display of the network-enabled audio device before the action button has been pressed, as shown in FIGS. 12A, 12B, 13A, and 13B.

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FIG. 20B shows a display of the menu items on the network-enabled audio device after the action button has been pressed.

FIG. 20C shows a display of the menu items on the network-enabled audio device after the "music" menu item has been chosen.

FIG. 20D shows a display of the menu items on the network-enabled audio device after the "albums" menu item has been chosen.

FIG. 20E shows a display of the menu items on the network-enabled audio device after the menu item representing an album has been chosen.

FIG. 20F shows a display of the menu items on the network-enabled audio device after the "buy" menu item has been chosen.

FIG. 21 shows a display including an advertisement after the action button has been pressed on the network-enabled audio device.

In the figures, the first digit of any three-digit number generally indicates the number of the figure in which the element first appears. For example, an element with the reference number 502 first appears in FIG. 5. Where four-digit reference numbers are used, the first two digits indicate the figure number.

#### DETAILED DESCRIPTION

One aspect of the present invention is an intelligent radio device that allows a user to receive digitized radio broadcasts over the World Wide Web (Web). The intelligent radio provides the hardware and software necessary to receive digitized audio from the Web without the need for a personal computer or other expensive equipment. The intelligent radio provides a display device, such as a Liquid Crystal Display (LCD) that allows the user to select a desired Web broadcast from a list of available Web broadcasts. The display also allows the user to select Web broadcasts in a particular language. The software, the user controls, and the display in the intelligent radio 100 are operably configured and connected such that a user can tune into a Web radio broadcast in a manner similar to the way a user would use the controls on a conventional radio to tune into an AM or FM radio station. Thus, the intelligent radio provides people who are not comfortable with computers, or who do not own or have access to a computer, an opportunity to listen to streaming audio information from the Internet.

In one embodiment, the intelligent radio is a low-cost tabletop box that connects to an AC power line and a phone line. The device includes a display device, speakers, a control panel, a computer processor, a stored software program, and a modem. The intelligent radio uses the modem to establish a telephone connection to an Internet Service Provider (ISP). The stored software program connects to a Web Radio home page, via the ISP, and downloads a list of Web radio station addresses. Alternatively, the user can enter a web address (e.g., a Uniform Resource Locator (URL)) to connect directly to a web page that provides audio broadcasts (instead of first connecting to the Web Radio home page). The user may use buttons on the control panel to scroll through the display and select a Web radio broadcast "station" for listening. When a station is selected, the stored software program connects to the station and begins to receive digitized audio data transmitted by the station. The intelligent radio converts the received data to analog audio and plays the audio on one or more loudspeakers.

In an alternate embodiment, the intelligent radio is a tuner that connects to an audio system such as a component stereo

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system. The tuner provides an audio output to the audio system. The audio system provides amplifiers and loudspeakers. The tuner comprises an enclosure that connects to an AC power line, a network line, and the audio system. The network line may be any type of computer data connection, including, for example, a telephone line, a cable line, an Ethernet line, a Token-Ring line, a twisted pair line, an infrared link, a radio frequency link, an IEEE-1394 FireWire line, etc. The tuner includes a display device, a control panel, a computer processor, a stored software program, and a modem. The intelligent radio uses the modem to establish a telephone connection to an Internet Service Provider (ISP). The stored software program connects to a Web Radio home page, usually provided by the ISP, and downloads a list of Web radio stations. A user uses buttons on the control panel (or remote control) to scroll through the display and select a Web radio broadcast "station" for listening. Alternatively, the user may use voice-activated commands to scroll through the display. When a station is selected, the stored software program connects to the station and begins to receive digitized audio data transmitted by the station. The intelligent radio converts the received data to analog audio, which is provided to the audio system.

FIG. 1 illustrates one embodiment of a tabletop intelligent radio 100. The intelligent radio 100 is mounted in an enclosure 101 and connects to household AC power through a power cord 104 and to a communications network by a network cable 102. The network cable 102 may be a telephone line, a network cable, a cable TV cable, a connection to a wireless (e.g., satellite) unit, etc. For example, the communications network may use Iridium satellites developed by the Motorola Corp., Globalstar satellites developed by a consortium of European manufacturers which includes Aerospatiale and Alcatel, P21 satellites developed on a project financed by Inmarsat, or the Odyssey satellite system developed by a TRW consortium associated with Teleglobe/Canada.

User controls are mounted on the front of the enclosure 101 and include a combined on-off and volume control 110, a command button 121, a cursor control 116, a select button 118, a tuning control 114, and a button bar 120. The cursor control 116 provides up, down, left, and right movements of a cursor or other entity on a display device 112. The button bar 120 provides buttons to select an audio source, including, for example, "AM" radio, "FM" radio, "Web" radio, "Cassette", and "External" input. Also mounted on the front of the enclosure 101 is the display device 112, which provides information to the user. An optional cassette player/recorder 130 provides the capability to play and record audio cassettes. The intelligent radio 100 also includes a left stereo speaker 106 and a right stereo speaker 108 that may be mounted in the enclosure 101 or in separate enclosures. A wireless remote 135 provides remote operation of the intelligent radio 100. In some embodiments, a microphone is provided as well. An output from the microphone is provided to an analog-to-digital converter to convert the analog microphone signal into digital data. The microphone may be placed in the intelligent radio 100, in the wireless remote 135, or both.

FIG. 2 is a block diagram of the functional elements of the intelligent radio 100. The intelligent radio 100 comprises a Central Processor Unit (CPU) 202 that is used to run the intelligent radio software. The CPU 202 is connected to a random access memory 204, a data storage device 210, and a modem 206. The data storage device 210 may be any type of non-volatile data storage device, including, for example, a floppy disk drive, a hard disk drive, a flash memory, a CD-ROM, a DVD-ROM, a CMOS memory with battery backup, etc. The data storage device 210 provides storage for software

programs used by the intelligent radio 100. The software stored on the data storage device 210 may be upgraded by downloading new software from the Web. The data storage device 210 may also provide storage for digitized audio material, such as recorded Web radio broadcasts, CD-Audio, etc. The modem 206 is connected to a communications network 230, shown as a Public Switched Telephone Network (PSTN), by the network cable 102. Although the communications network 230 is shown as a PSTN network, one skilled in the art will recognize that the network 230 may also be a cable television (CATV) network, a satellite network, or any other communications network. In one embodiment, the network 230 comprises both a Direct TV/PC satellite connection that provides information to the intelligent radio 100 at high speed (e.g., 400,000 bytes per second or more), and a PSTN network connection so the intelligent radio can upload information back to the ISP 232 (because many Direct TV/PC connections are only one-way). In yet another embodiment, the satellite network is a two-way satellite network that uses the satellite for both download and upload. In one embodiment, the satellite network uses the Iridium™ system developed, in part, by the Motorola Corp.

Optionally, a telephone 229 is connected to a first port of a codec 260. A second port of the codec 260 is provided to the CPU 202. The codec 260 provides digital-to-analog conversion and analog-to-digital conversion for the telephone 229. The codec 260 also provides standard telephone interface signals, such as a ringing signal, to the telephone 229, and telephone status conditions, such as receiver up or receiver down, to the CPU 202. In some embodiments, the codec 260 and the modem 206 may be combined as a telephone modem. The telephone 229 may be connected even when the network 230 is not a telephone network.

The modem 206 provides an interface between the CPU 202 and the communications network 230 and the operational characteristics of the modem 206 are determined by the type of communications network 230. Thus, if the network 230 is a PSTN network, then a telephone modem is used; if the network 230 is a CATV network, then a cable modem is used, etc. In a preferred embodiment, the modem 206 is integral to the intelligent radio 100. In other embodiments, the modem 206 is provided in a separate enclosure. An Internet Service Provider (ISP) 232 provides the user with a connection from the communications network 230 to the Web via the Internet 234. Note that FIG. 2 shows functional elements, but not necessarily hardware configurations. Thus, for example, the modem 206 may be implemented in software on the CPU 202. The CPU 202 may be a Digital Signal Processor (DSP). The CPU 202 may comprise a single computer processor, or multiple computer processors. In one embodiment, the CPU 202 comprises two processors, a DSP and a general purpose microprocessor. In one embodiment, the modem 206 is provided in a plug-in module such that the intelligent radio can be configured for different types of computer networks by simply changing the modem plug-in to suit the type of network being used.

The CPU 202 provides data to the display device 112. The CPU 202 receives user inputs from the command button 121, the tuning control 114, the button bar 120, the select button 118, and the cursor control 116. The CPU 202 provides digitized audio samples to an input of a Digital-to-Analog Converter (DAC) 220. The analog audio output of the DAC 220 is provided to an amplifier 222. In a preferred embodiment, the DAC 220 and the amplifier 222 are each two-channel devices, providing left and right stereo channels. A left channel output of the amplifier 222 is provided to the left channel speaker 106 and a right channel output of the amplifier 222 is provided

to the right channel speaker 108. The volume control 110 controls the gain of the amplifier 222.

As shown in the preferred embodiment in FIG. 2, the other optional audio sources such as the cassette device 130, an AM tuner 240, an FM tuner 242, and an external input 244 also provide inputs to the amplifier 222. Other optional audio sources may be provided, such as, for example, an audio CD, a DVD, a digital audio tape unit, etc. The CPU 202 controls the cassette device 130, the AM tuner 240, the FM tuner 242, and other optional audio sources. A line output from the amplifier 222 may also be provided to a record input of the cassette device 130.

As described above, the button bar 120 is used to select one of the audio sources. When the button bar 120 is set to "AM," the intelligent radio 100 operates in an AM radio mode. In the AM radio mode, an analog output from the AM tuner 240 is provided to the amplifier 222. Also in the AM radio mode, the display device 112 displays the frequency of an AM station selected by the AM tuner 240. The user may use the tuning control 114 to select a desired AM station. The AM mode is optional.

An analog output from a microphone 250 is provided to an analog input of an analog-to-digital converter 252. A digital output from the analog-to-digital converter 252 is provided to the CPU 202. The microphone 250 and converter 252 allow for voice commands to control the intelligent radio. The microphone 250 and converter 252 are optional. In some embodiments, a microphone is also placed in a wireless remote so that voice commands can be provided from the wireless remote.

When the button bar 120 is set to "FM," the intelligent radio 100 operates in an FM radio mode. In the FM radio mode, the analog audio output from the FM tuner is provided to the amplifier 222, and the display device 112 displays the frequency of the FM station selected by the FM tuner 242. The FM mode is also optional.

When the button bar 120 is set to "Cassette," the intelligent radio 100 operates in a cassette playback mode. In the cassette playback mode, analog output from the cassette player is provided to the amplifier 222, and the display device 112 displays information relating to the cassette playback. The cassette playback mode is also optional. The cassette device 130 may also optionally be configured to provide a record capability such that the cassette can be used to record audio information from any of the other modes. Thus, for example, the cassette can be used to record FM radio, AM radio, or Web radio broadcasts.

When the button bar 120 is set to "Web," the intelligent radio 100 operates in a Web Radio mode. In the Web Radio mode, the intelligent radio 100 uses the modem 206 to connect to the ISP 232. The ISP 232 provides a list of available Web broadcasts, and access to the Internet 234, so that the various Web broadcasts can be received by the intelligent radio 100. In the Web Radio mode, the display device 112 is used to select a Web broadcast and to provide information about the selected Web broadcast.

FIGS. 3A through 3E show various displays provided by the display device 112 while in the Web Radio mode. FIG. 3A shows a default display 300 that appears while a Web broadcast is being received. FIG. 3B shows a menu display that allows the user to select one of the command and setup displays shown in FIGS. 3C-3E.

The display 300, shown in FIG. 3A, includes information about the Web broadcast including the type of broadcast (e.g., "Newscast"), the Web address (URL) of the source for the broadcast (e.g., <http://www.upr.org>), a description of the

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broadcast (e.g., "National Public Radio 1997"), a broadcast format (e.g., "Streaming RealAudio"), etc.

FIG. 3B shows a menu display 320 that allows the user to access the various setup and control displays shown in FIGS. 3D-3E. The user activates the menu display 320 by pressing the command button 121. The display 320 provides a menu list 322 that lists the various other command displays. The list 322 may provide: a "Tune Station" command for activating a tune-station display 340, shown in FIG. 3E; a "Select Language" command for activating a select-language display 310, shown in FIG. 3C; and a "Select List" command for activating a select-list display 322, shown in FIG. 3D. The list 322 may also provide commands to activate other displays (not shown) such as "Setup," to initialize the intelligent radio, "Scan Stations," to get a new list of Web broadcast stations from the Internet 234, and "Define Station," to manually define a Web broadcast station not listed. The list 322 may also provide commands to activate other displays such as "Set Clock," and "Set Alarm," to provide optional clock and alarm clock modes for the display device 112.

The display 320 also provides a scroll bar 321 to allow the user to scroll through the list 322 and select an item (command) from the list. Scrolling may be accomplished by using either the cursor control 116 or the tuning control 114. The user uses the cursor control 116 or the tuning control 114 to highlight a desired menu item in the list 322, and then the user presses the select button 118 to select the highlighted menu item.

The select-language display 310, shown in FIG. 3B, allows the user to elect to receive Web broadcasts in one or more selected languages. The display 310 provides a list of available languages 312 and a scroll bar 314 for scrolling through the list 312. Each item in the list 312 corresponds to a language (e.g., English, French, etc.) and each item is provided with a checkbox 313. If a checkbox 313 is checked, then the corresponding language is enabled. The display 310 also provides an OK button 315, a Cancel button 316, a Clear-All button 317, and a Select-All button 318. The Clear-All button 317 clears all of the checkboxes 313, and the Select-All button 318 checks all of the checkboxes 313. The user "presses" one of the buttons 315-318 by using the cursor control 116 to highlight a desired button and then pressing the select button 118 to "press" the highlighted button.

The select-list display 330, shown in FIG. 3D, allows the user to select a preferred type of program material (e.g., Sports, Weather, News, All, etc.). The display 330 includes a list 332 of program types and a scroll bar 331. The user uses the cursor control 116 or the tuning control 114 to highlight a desired program type from the list 332, and then the user presses the select button 118 to select the highlighted program type.

The select-broadcast display 340, shown in FIG. 3E, allows the user to select a Web broadcast. The display 340 includes a list 342 of the available Web broadcasts having the proper language (as selected in the select language display 310) and the desired program type (as selected in the select-list display 331). The user uses the cursor control 116 or the tuning control 114 to highlight a desired broadcast from the list 342, and then the user presses the select button 118 to select the highlighted program type. Each item in the list 342 is provided with a checkbox 343. If the checkbox 343 is checked, then the corresponding broadcast is a preferred (or "fast-tune") broadcast. The user may scroll through the fast-tune broadcasts by using the tuning control 114 from the default display 300 shown in FIG. 3A, without having to activate the select-broadcast display 340. This provides a

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convenient shortcut feature to allow the user to quickly tune to stations that the user regularly listens to.

FIG. 4 illustrates a data-entry display 450 that allows the user to input alphanumeric text (e.g., the telephone number of the ISP 232 or a URL). The display 450 includes a text prompt 451 to prompt the user for the desired data. The display also includes an on-screen keyboard 452, a text display 453, an OK button 454 and a Cancel button 455. The user enters text by using the cursor control 118 to highlight a desired character on the on-screen keyboard 452 and then pressing the select button 118 to enter the highlighted character into the text display 453. The OK button 454 and the Cancel button 455 are "pressed" in the same fashion.

FIG. 5 is a flowchart 500 that begins at a start block 501 and illustrates the Web Radio mode process. The process advances from the start block 501 to a decision block 502, where the process checks a status flag to determine whether or not the intelligent radio software needs to be initialized (setup). If setup is needed, then the process advances to a process block 504; otherwise, the process jumps over the setup steps to a process block 504. In the process block 504, the process obtains a phone number for the desired ISP 232. The phone number may be obtained from a default phone number stored in the intelligent radio software, or by prompting the user through the data-entry display 450. Once the phone number has been obtained, the process advances to a process block 506, where the modem 206 dials the telephone number and establishes a modem connection with the ISP 232. Once the connection is established, the process advances to a process block 508 where the user establishes an account with the ISP 232.

In one embodiment, the user is prompted for a password that is stored on the data storage device 210 or entered using the data-entry display 450. Establishing an account may include other actions, such as creating a username for the user, changing the phone number used to access the ISP 232, and entering information about the user and the user's account. Once an account is established, the process advances to a process block 510 where a list of available Web radio broadcast stations is downloaded to the intelligent radio 100 from the ISP 232 and stored on the storage device 210. Lists of available languages and program types are also downloaded and stored on the storage device 210. Once the lists are downloaded, the process advances to a hang-up block 512 wherein the modem 206 terminates the network connection (e.g., hangs-up the phone). Upon hang-up, the setup process is complete, and the process advances to the process block 514.

In the process block 514, the modem dials the ISP 232 and then advances to a process block 516 where the intelligent radio 100 logs on to the user's account at the ISP 232. The hang-up, redial, and logon (blocks 512, 514, and 516, respectively) is desirable when using a PSTN, because the initial telephone call, placed in the block 506, is typically a long-distance call or a toll-free (e.g., a 1-800) call. By contrast, the telephone call placed in the block 514 is typically a local call. When using a non-PSTN network (e.g., a cable modem, a satellite network, etc.) then the hang-up, redial, and logon (blocks 512, 514, and 516, respectively) is typically omitted.

Once the user is logged on, the process advances to a process block 518 where the user selects (tunes) a Web radio broadcast station. Once a Web broadcast has been selected, the process advances to a process block 520 where the intelligent radio 100 receives the Web broadcast. The CPU 202 decodes and decompresses the received data as necessary and then sends the decompressed data to the DAC 220 where it is converted to an analog signal that is subsequently played on

the speakers 106, 108. The process remains in the process block 520 while the user listens to the Web broadcast.

If the user tunes to a new Web broadcast station (e.g., by turning the tuning control 114 or by activating the select-broadcast display 340) then the process loops back to the process block 518, selects the new station, and returns to the process block 520.

FIG. 6A illustrates the information management and data processing functions 600 provided by a Web Radio site 602 (e.g., www.webradio.com). Access to the Internet site 602 is made possible by the Internet access provided by the ISP 232. The Internet site 602 provides a list of Web radio broadcast stations for the user and optionally other value-added services that enhance the operation of the intelligent radio 100. For example, the Internet site 602 may provide a list of available program sources and streaming audio programming. The site 602 may also maintain user profile comprising a list of preferred Internet "broadcast stations." The site 602 also provides special download capabilities such that the user can download information and software into the intelligent radio. The site 602 also provides upload capabilities such that the user can upload information, such as preferences, etc., from the intelligent radio 100 to the site 602. For example, the site 602 can provide a customized list of stations for each user and voicemail capability. The site 602 may provide reformatting of streaming audio data into a format better suited for the intelligent radio.

In one embodiment, the site 602 also provides Web telephone capabilities to the intelligent radio 100, such that the user can use the intelligent radio as a telephone to talk to other users that are connected to the Internet. In one embodiment of the Web telephone, the codec 260 is used to digitize speech from a microphone in the handset of the telephone 229. The digitized speech is sent over the network 230 to the ISP. The ISP forwards the digitized speech to a remote user. Similarly, the ISP provides digitized speech from the remote user to the intelligent radio. The intelligent radio uses the codec 260 to convert the digitized speech into analog signals that are played on the speakers 106 and 108 or a speaker in the handset of the telephone 229.

In yet another embodiment, the intelligent radio provides voice email in connection with the site 602. To receive email, text-to-voice software in the site 602 is used to convert email text into digitized voice data as words spoken in the user's desired language. The digitized voice data is provided to the intelligent radio where it is converted to an analog signal and played on the speakers 106 and 108 or a speaker in the handset of the telephone 229. To receive email, the user speaks into the microphone 250 or the microphone in the handset of the telephone 229 and the spoken words are converted into digitized speech by the intelligent radio. The intelligent radio sends the digitized speech to the site 602 where it is converted into email text and then emailed to the recipient. The software to convert speech to text and text to speech is provided in the site 602 in order to minimize the cost and complexity of the intelligent radio. Alternatively, the software to convert speech to text and text to speech is provided in the intelligent radio.

In one embodiment, the site 602 also provides special formatting and markup protocols that are tailored to the intelligent radio display 112. Most existing Internet sites are geared towards a computer or television and assume that a user has a large, high resolution, color monitor. Most existing Internet sites also assume that a user is accessing the site by using a Web browser such as Netscape Navigator™ or Microsoft Internet Explorer™. These browsers support high level protocols such as HyperText Markup Language (HTML). The display 112 may be relatively smaller, and

relatively less capable than a traditional computer monitor. In some embodiments, the display 112 does not necessarily need all of the capabilities and complexity of HTML and is thus better served by information that is formatted for the display 112 and that is expressed in a markup language that is suited to the needs of the intelligent radio 100, without the overhead and complexity of HTML.

When the user connects to the Internet site, information is passed along a first data stream to an account management block 604. The block 604 provides account management functions relating to the user's account with the ISP 232. The account management block passes data to a user preference block 606, which retrieves user profile information and user preferences specified by the user. Information regarding the user preferences may be stored by the ISP 232, or downloaded from the intelligent radio 100 as needed.

Information is also passed from the process block 602 along a second data stream to a program management block 608. The program management block 608 accesses a language variety database 610 to determine which languages are available, and a program variety database 612 to determine which types of programs are available. The program management block 608 also accesses program sources such as live broadcasts 620, archived broadcasts 624, stored music 626, and other streaming audio sources 622.

User profile information from the user preference block 606 and program data from the program management block 608 are provided to a program list block 616, which constructs a list of available Web programs (broadcasts) that fit the user's preferences. The list constructed in the block 616 is passed to the intelligent radio 100.

FIG. 6B shows the conceptual relationship between the site 602 and other Web sites that supply streaming audio information, such as a site 630, a site 631, and a site 632. The Internet provides the ability to transfer data between any two of the sites 602, 630-632. The user connects, through the ISP 232, to the site 602. The site 602 provides links to the sites 630-632 through the programming lists provided by the site 602. If the user selects a streaming audio program from one of the sites 630-632, then the site 602 provides the necessary link to the selected site. In some embodiments, the site 602 provides the link information to the intelligent radio 100, and the intelligent radio 100 makes a "direct" connection to the selected site. In other embodiments, the site 602 links to the selected site, receives the streaming audio data, reformats the data if desired, and then sends the streaming audio data to the intelligent radio 100.

FIG. 7 illustrates an embodiment of an intelligent radio tuner 700. The tuner 700 is mounted in an enclosure 701 and connects to household AC power through a power cord 104, to a network through a network cable 102, and to an audio system through an audio line 702. User controls are mounted on the front of the enclosure 701 and include an on-off switch 704, a command button 121, a cursor control 116, a select button 118, and a tuning control 114. The cursor control 116 provides up, down, left, and right movements of a cursor or other entity on a display device 112. Also mounted on the front of the enclosure 701 is the display device 112, which provides information to the user.

FIG. 8 is a block diagram of the functional elements of the intelligent radio configured as a tuner 700. The tuner 700 comprises the Central Processor Unit (CPU) 202 that is used to run the intelligent radio software. The CPU 202 is connected to the random access memory 204, the data storage device 210, the modem 206, and the codec 260. The data storage device 210 may be any type of non-volatile data storage device, including, for example, a floppy disk drive, a

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hard disk drive, a flash memory, a CD-ROM, a DVD-ROM, a CMOS memory with battery backup, etc. The modem 206 is connected to a communications network 230, shown as a Public Switched Telephone Network (PSTN). Although the communications network 230 is shown as a PSTN network, one skilled in the art will recognize that the network 230 may also be a cable television (CATV) network, a satellite network, or any other communications network. The modem 206 provides an interface between the CPU 202 and the communications network 230 and the operational characteristics of the modem 206 are determined by the type of communications network 203. Thus, if the network 230 is a PSTN network, then a telephone modem is used; and if the network 230 is a CATV network, then a cable modem is used, etc. An Internet Service Provider (ISP) 232 provides the user with a connection from the network 230 to the Web via the Internet 234.

The CPU 202 provides data to the display device 112. The CPU 202 receives user inputs from the command button 121, the tuning control 114, the select button 118, and the cursor control 116. The CPU 202 provides digitized audio samples to an input of a Digital-to-Analog Converter (DAC) 220. The analog audio output of the DAC 220 is provided to the audio output 702. In a preferred embodiment, the DAC 220 is a two-channel device, providing left and right stereo channels.

FIG. 9 is a block diagram of the functional elements of an embodiment of an intelligent radio that provides for remote playback. FIG. 9 shows a base unit 900 that is connected to the communications network 230. The base unit 900 receives streaming audio from the Web and transmits the audio information to a remote playback unit 902.

The base unit 900 is similar in most respects to the intelligent radio except that the amplifier 222, the loudspeakers 106 and 108, and the volume control 110 are not located in the base unit 900, but rather are located in the remote playback unit 902. In the base unit, the DAC 220, the cassette device 130, the AM tuner 240, the FM tuner 242, and the external input 244 are connected to a transmitter 904 rather than the amplifier 222. The transmitter 904 provides a transmitted signal to a receiver 906 in the remote unit 902. The receiver 906 provides an audio output to the amplifier 222.

The base unit 900 receives the streaming audio information from the Internet 234 and uses a transmission carrier to retransmit the audio information to one or more remote units 902. The transmitter 904 and the receiver 906 may use any form of communication for the transmission carrier, including radio frequency communication, infrared communication, ultrasonic communication, etc. In one embodiment, the transmitter 904 may be a low power FM (Frequency Modulation) transmitter compatible with standard FM broadcast bands, such that the remote playback unit 902 can be a standard FM transistor radio or a stereo receiver. In yet another embodiment, the transmitter 904 may be a low power AM (Amplitude Modulation) transmitter compatible with standard AM broadcast bands, such that the remote playback unit 902 can be a standard AM transistor radio or a stereo receiver.

In other embodiments, the base unit 900 may also include an amplifier 222, loudspeakers 106 and 108, and a volume control 110 such that the base unit 900 can provide both playback of the audio information and transmission of the audio information to the remote unit 902.

FIG. 10 is a block diagram of the functional elements of an embodiment of an intelligent radio that provides for remote access, comprising a base unit 1002 and an intelligent radio 1000. The base unit 1002 comprises a transceiver 1012 coupled to a modem 1011. The modem 1011 is connected to the communications network 230. The modem 1011 receives

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data from the ISP and provides the data to the transceiver 1012, which then transmits the data to a transceiver 1010 in the intelligent radio 1000. The transceiver 1010 transmits data from the intelligent radio 1000 to the transceiver 1012. The transceiver 1012 provides the data from the intelligent radio 1000 to the modem 1011, which sends the data to the ISP 232.

The intelligent radio 1000 is similar in most respects to the intelligent radio 100 shown in FIG. 2, with the addition of the transceiver 1010. A data input/output port of the transceiver 1010 is provided to the processor 202 and a Radio Frequency (RF) input/output port of the transceiver 1010 is provided to an antenna. Also, in the intelligent radio 1000, the modem 206 is optional (because network communications are handled by the transceiver 1010 rather than the modem 206).

The transceivers 1010 and 1012 use any suitable means for communication, including, for example, optical communication, radio communication, etc. In a preferred embodiment, the transceivers 1010 and 1012 are radio transceivers that use spread-spectrum communication techniques at a frequency of approximately 2.4 GHz. The combination of the base unit 1002 and the intelligent radio 1000 provides a capability similar to that provided by a cordless telephone. The base unit 1002 can be located near a network connection point (e.g., a telephone outlet), and the intelligent radio 1000 can be conveniently placed anywhere within the range of the base unit 1002. The two-way communication link between the transceiver 1010 and the transceiver 1012 provides a cordless connection to the network 230.

In one embodiment, the intelligent radio, as shown in FIG. 1, is a network-enabled audio device. FIG. 11 illustrates one embodiment of the network-enabled audio device configured for use with other electronic devices. In one embodiment, the network-enabled audio device works in conjunction with a PC. With a network connection, software on a PC can be used to assign playlists of songs to the network-enabled audio device. Further, the network-enabled audio devices can be set to turn on at a certain time and play a playlist of music. In one embodiment, songs encompass a variety of audio sources including, but not limited to, audio files containing music and/or advertisements. Optionally, the network-enabled audio devices can turn on through an Internet connection as well. The front panel, including the user controls, can be disabled in order to prevent users from turning the device off when a playlist is scheduled.

In one embodiment, the network-enabled audio device records user activity and provides that information to a server for data mining purposes. For instance, a user's composition of a playlist including songs from The Beatles can be recorded by the network-enabled audio device and sent to a server tracking the number of users composing playlists including songs from The Beatles. Tracking information can then be provided to record companies interested in selling more Beatles MP3's to gauge consumer demand. In one embodiment, a button is provided for allowing the user to turn the logging feature on or off.

In FIG. 11, an IPAN 1100 includes an IPAN server 1104, a PC IPAN client 1106, a network 1102, a device B 1108, a device A 1110, and user controls 1112. The PC IPAN client 1106 connects to the IPAN Server 1104 through the network 1102 (such as the Internet). The Device 1110 represents a network-enabled audio device, which connects at a default time to the IPAN server 1104. The user can optionally change the default time or can connect to the IPAN server 1104 at a desired time independent of the default time. The user can use the user controls 1112 on the Device 1110 to bypass the default time and connect to the server 1104 immediately. When the Device 1110 connects, the IPAN server 1104 may

have a playlist for the Device 1110. The IPAN server 1104 downloads the playlist to the device 1110. The IPAN server 1104 checks to see what devices have the audio files listed in the playlist. The IPAN server 1104 maintains a list of URL's from which the device 1110 received audio files listed in the playlists. In one embodiment, the list of URL's is stored in a catalog. In one embodiment, the catalog also includes other information such as, for example, a list of available audio playback devices and their settings, scheduled audio playback, and/or commands for system synchronization. The Device 1110 attempts to connect to the URL's listed as the location from which the songs located on the Device's 1108 hard drive were retrieved from. If the URL's do not work and the song exists in the IPAN 1100, then the audio files are transferred from the Device 1108 to the Device 1110 by uploading the files from the Device 1108 the next time the Device 1108 connects. The next time the Device 1110 connects, it will download the list of files from the server. If the song does not exist in the IPAN, the Device 1110 attempts to download the song at intervals until the user deletes the song from the playlist or the song is added to the Device 1108. In one embodiment, for example, an empty cone will appear beside the song in the playlist that could not be downloaded. The user can delete the song in order to request a cease in the attempts to download, or the user can refrain from deleting the song from the playlist in order to request that further attempts be made to download the song. A request for further attempts in downloading the song results in further iterations of Device 1110 attempting to download the song from the broken URL followed by attempts to upload the song from Device 1108 when Device 1108 connects.

FIGS. 12A and 12B illustrate one embodiment of a network-enabled component audio device 1200. The device 1200 represents one embodiment of the intelligent radio 700. FIG. 12A illustrates a front view of the network-enabled audio device 1200. The network-enabled audio device 1200 has user controls which are mounted on the front of an enclosure 1202 and include a power button 1204, a shuttle control 1214, an enter button 1216, menu buttons 1212, an action button 1210, and a CD-eject button 1222. On the shuttle control 1214, there is a right button 1264, a left button 1260, an up button 1262, and a down button 1266 for navigating through menus on the display 1230. An infrared port 1208 is mounted on the front of the enclosure 1202 to read signals from a remote control 1250. In one embodiment, the remote control includes buttons for volume, enter, navigation shuttle, action, power, CD eject, and five preset menu buttons. A CD player 1220 is also mounted on the front of the enclosure 1202 to play standard audio CD's or MP3 encoded CD's.

In one embodiment, the display 1230 has a menu bar to provide the user with options for listening to playlists, listening to the CD player, or listening to streaming audio. The shuttle control 1214 is used to scroll through the selections in a playlist. Each selection is highlighted as the shuttle control 1214 is pressed right 1264 or left 1260. When the user makes a choice, the enter button 1216 is pressed to signify that choice being made. If the user chooses the playlist option, a drop down menu is displayed in the display 1230 showing the available playlists. The user then uses the shuttle control 1214 to scroll through the playlists by pressing the up button 1262 or the down button 1266. Once the user chooses an audio source with the shuttle control 1214, the user can navigate and play the audio with the group of menu buttons 1212.

The group of menu buttons 1212 is context sensitive and will change function depending on the audio source. For example, in one embodiment, if the user selects the CD player 1220 as the audio source, then the first menu button in the

group of menu buttons 1212 is used to play the CD while the second menu button is used to stop. In one embodiment, the bottom of the display 1230 changes according to the audio source determined by the user. If the user chooses to play CDs, a "play" icon appears above the first button in the group of menu buttons. In one embodiment, if the user chooses to listen to the AM/FM radio, a scan icon appears above the first button in the group of menu buttons 1212.

In addition to allowing the user to play files, the network-enabled audio device allows the user to play audio CD's on the CD player 1220. Further, the user can copy and encode songs off CD's in digital formats (known as "ripping") and compose playlists with those songs and other files and streaming audio.

The action button 1210 allows the user to request the latest news, albums, concerts and other information on artists. For example, if the user is listening to a streaming audio broadcast and does not know who the artist is, he or she can press the action button 1210 and receive information on the display 1230 identifying the artists, the name of the songs, interesting facts about the artist, etc. Optionally, the user can acquire similar information by pressing the action button when listening to a CD or a playlist. In one embodiment, the network-enabled audio device 1200 acquires this information by accessing the IPAN server 1104. The IPAN server 1104 then accesses its own database to search for the requested information. Optionally, the database is located on at least one different server than the IPAN server 1104. In one embodiment, if the information is not found, a sample of the song will be sent to another server to analyze the sample and report back to the IPAN server 1104 with the correct information.

FIG. 12B illustrates a rear view of the network-enabled component audio device 1200. The network-enabled audio device 1200 connects to household AC power through a power cord 1268. The network-enabled audio device 1200 includes a phone jack 1250, an Ethernet port 1252, a line-in connector 1264 having left and right channels, a line-out connector 1262 having left and right channels, a microphone jack 1258, a headphone jack 1260, a TOS link 1256, and a USB port 1254.

In one embodiment, the phone jack 1250 can be used to either establish a modem connection to an ISP and/or to establish a LAN connection (e.g. Home Phone Network Alliance network connection). The Ethernet port 1252 can be used with an Ethernet cable to provide access to an Ethernet LAN. Optionally, the Ethernet port 1252 can be replaced or supplemented with other types of connections to communications networks. A network cable provided to the Ethernet port 1252 can be a network cable, a cable TV cable, a connection to a wireless (e.g., satellite) unit, a power line, etc. For example, the communications network uses satellites developed by the Motorola Corp., Global Star satellites developed by a consortium of European manufacturers which includes Aérospatiale and Alcatel, P21 satellites developed on a project financed by Inmarsat, or the Odyssey satellite system developed by a TRW consortium associated with Teleglobe/Canada.

In one embodiment, the network-enabled audio device 1200 provides an audio output to an associated audio system. For high-speed interaction with other audio components, the digital out TOS link 1256 (also known as "Optic S/PDIF") is used for an optical connection to provide for the transfer of raw digital streams. Files can be transferred from the network-enabled audio device 1200 without a conversion from digital to analog signals. When the audio file reaches the associated audio system, such as for example a portable MP3 player, the digital audio stream is then converted to an analog

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stream within the associated audio system to enhance audio quality. The associated audio system provides for amplifiers and loudspeakers.

The line in connector 1264 is an analog line in from another device. The line out connector 1262 is an analog line out to standard left and right RCA-style connectors. The standard USB host connector 1254 allows downloading of music to portable MP3 players (in a host downloading to a slave relationship) and/or USB networking with a PC or other network-enabled audio device 1200 or 1300.

FIGS. 13A and 13B illustrate one embodiment of a tabletop network-enabled audio device 1300. FIG. 13A illustrates a front view of the tabletop version of the network-enabled audio device 1300. As described in more detail below, the network-enabled audio device 1300 is similar to the network enabled audio device 1200 with the addition of extra features such as a radio, amplifier, and speakers. The network-enabled audio device 1300 has user controls which are mounted on the front of the enclosure 1302 and includes the power button 1204, the shuttle control 1214, the enter button 1216, the menu buttons 1212, the action button 1210, the volume control 1316, and a CD eject button 1222. The shuttle control 1214 includes the right button 1264, the left button 1260, the up button 1262, and the down button 1266 for navigating through menus on the display 1230. The infrared port 1208 is mounted on the front of the enclosure 1302 to read signals from the remote control 1250. In one embodiment, the remote control includes buttons for volume, enter, navigation shuttle, action, power, CD eject, and five pre-set menu buttons. The CD player 1220 is also provided on the device 1300 to play standard audio CD's or MP3 encoded CD's. A right speaker 1303 and a left speaker 1303 are operably connected to the network-enabled audio device 1300.

In one embodiment, the group of menu buttons 1212 perform the same or similar functions as the group of menu buttons 1212 in the network-enabled component audio device 1200 illustrated in FIG. 12 except that the display 1230 will illustrate an additional option of playing an AM/FM radio. Therefore, when the shuttle control 1214 is used to select the AM/FM radio audio source and the user presses the enter button 1216, the icons that reflect functions such as tuning, scanning, and other buttons used to navigate and manage an AM/FM audio source appear. If the user chooses to listen to the AM/FM radio, a scan icon appears above the first menu button 1212.

FIG. 13B illustrates a rear view of the tabletop network-enabled audio device 1300. The network-enabled audio device 1300 connects to household AC power through the power cord 1268. The network-enabled audio device includes the phone jack 1250, the Ethernet port 1252, the line-in connector 1264 having left and right channels, the line-out connector 1262 having right and left channels, the microphone jack 1258, the headphone jack 1260, an AM/FM antenna port 1390, left and right speaker outputs 1392, and the USB port 1254.

In one embodiment, the network-enabled audio device 1300 has an AM/FM antenna port for connecting to an AM/FM antenna. The network enabled audio device 1300 includes an amplifier and loudspeakers 1303 (as will be described in FIG. 14) which connect to the left and right speaker outputs 1350.

FIG. 14 is a block diagram of the functional elements of the network-enabled audio devices 1200 and 1300. The network-enabled audio device 1300 typically includes the functional elements of the network-enabled audio device 1200. The network-enabled component audio device system 1300 includes an AM Tuner 1418, an FM tuner 1420, an amplifier

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1422, and the speakers 1303. In one embodiment, the network-enabled audio device 1200 does not include the AM tuner 1418, the FM tuner 1420, the amplifier 1422, or the speakers 1303. A Central Processing Unit (CPU) 1402 and a CPU Support Chip 1406 are used to run the software on the network-enabled audio devices 1200 and 1300. In one embodiment, the CPU 1402 is a StrongARM SA-1110 manufactured by Intel, and the CPU Support Chip 1406 is a StrongARM SA-1111 manufactured by Intel. The network-enabled audio device 1200 includes a display 1408, a modem 1410, a memory card 1412, a data storage device 1414, a codec 1416, a CD player, a DAC 1470, a microphone 1480, a line-in port 1482, and a line out 1484. Further, the network-enabled audio device 1200 includes user controls, including a shuttle control 1214, a group of menu buttons 1212, an enter button 1204, and an action button 1210. The network-enabled audio device 1200 connects externally to a network 1428. The network 1428 is shown as a Public Switched Telephone Network (PSTN) 1428 that connects to an ISP 1429 which gives access to the Internet 1102. Through the Internet 1102, a user can access the server site 1104 and thereby access the server site IPAN software 1433.

In one embodiment the CPU 1402 communicates with the random access memory 1412, the telephone modem 1410, and the display 1408. The memory 1412 can be flash memory or a combination of flash memory and other types of memory. The memory 1412 can be volatile or non-volatile or a combination of volatile and non-volatile. The modem 1410 is connected to a communications network 1428, shown as a PSTN 1428. In one embodiment, the modem 1410 is also connected to an HIPNA network. Although the communications network 1428 is shown as a PSTN network, one skilled in the art will recognize that the network 1428 can also be a cable television (CATV) network, a satellite network, or any other communications network. In one embodiment, the network 1428 comprises both a Direct TV/PC satellite connection that provides information to the network-enabled audio device at high speed (e.g., 400,000 bytes per second or more), and a PSTN 1428 network connection so the intelligent radio can upload information back to the ISP 1429 (because many Direct TV/PC connections are only one-way). In yet another embodiment, the satellite network is a two-way satellite network that uses the satellite for both download and upload.

A port of the codec 1416 is provided to the CPU Support Chip 1406. In one embodiment, the codec is a Cirrus CS4299 audio codec. The codec 1416 provides analog-to-digital conversion for the microphone 1480 and for the line in 1482, and digital-to-analog conversion for the line out 1484. In some embodiments, the codec 1416 and the modem 1430 are combined as a telephone modem.

The modem 1410 provides an interface between the CPU 1402 and the communications network 1428 and the operational characteristics of the modem 1410 are determined by the type of communications network 1428. Thus, if the network 1428 is a PSTN network, then a telephone modem is used; if the network 1428 is a CATV network, then a cable modem is used, etc. In a preferred embodiment, the modem 1430 is integral to the network-enabled audio device. An Internet Service Provider (ISP) 1429 provides the user with a connection from the communications network 1428 to the Web via the Internet 1430. The server site 1104 can then be accessed, and the server site IPAN software 1433 can be used by the user to manage audio sources and devices. Note that FIG. 14 shows functional elements, but not necessarily hardware configurations. Thus, for example, the modem 1410 can be implemented in software on the CPU 1402 or even on the CPU Support Chip 1406. The CPU 1402 is a single computer



processor, or multiple computer processors. In one embodiment, the CPU 1402 comprises two processors, a Digital Signal Processor (DSP) and a general purpose microprocessor. In one embodiment, the modem 1410 is provided in a plug-in module such that the intelligent radio can be configured for different types of computer networks by simply changing the modem plug-in to suit the type of network being used.

Optionally, the microphone 1480 is connected to a second port of the codec 1416. An analog output from the microphone 1480 is provided to the codec 1416. A digital output from the codec 1416 is provided to the CPU 1402. The microphone 1480 allows for voice commands to control the network-enabled audio device. The microphone 1416 is optional. In one embodiment, a microphone (not shown) is also placed in a wireless remote so that voice commands can be provided from the wireless remote. Optionally, headphones can also be used.

The CPU 1402 provides data to the display device 1408. The CPU 1402 receives user inputs from the shuttle control 1214, the group of menu buttons 1212, the enter button 1202, and the action button 1210.

A system bus interface interconnects the CPU 1402 to the CPU Support Chip 1406. In one embodiment, the CPU Support Chip provides digitized audio samples to an input of the Digital-to-Analog Converter (DAC) 1470. The analog audio output of the DAC 1470 is provided to the amplifier 1422. In one embodiment, the DAC 1470 and the amplifier 1422 are each two-channel devices, providing left and right stereo channels. Channel outputs of the amplifier 1422 are provided to the speakers 1303. The volume control controls the gain of the amplifier 1422. In one embodiment, the amplifier and speakers are part of an external stereo system.

The CPU support chip 1406 is also operably connected to a CD player 1426 which outputs audio to the amplifier 1422 or an external amplification system. The CPU Support Chip 1406 or optionally the CPU 1402 also maintains software for managing the transfer of audio files from CD's to the network-enabled audio device's hard drive.

FIG. 15 illustrates a configuration for assigning playlists and audio sources to a network-enabled audio device 1510 or other devices such as a PC 1508 from a network-enabled audio device 1520 or another device. Each network-enabled audio device 1510 has a storage space 1512 for network-enabled audio device IPAN software 1526, a playlist 1528, and associated URL's and songs within the playlist. Similarly, each network-enabled audio device 1520 has a storage space 1522 for network-enabled audio device IPAN software 1526, a playlist 1528, and associated URL's and songs within the playlist. Each client PC 1508 has a storage space 1524 for client IPAN software 1532, a playlist 1534, and associated URL's and songs within the playlist. The server site 1104 includes server site IPAN software 1433, the playlist 1528 stored on the storage space 1522 of device 1510, the playlist 1530 stored on the storage space 1524 of the client PC 1508, and the playlist 1530 stored on the storage space 1522 of the device 1520. A storage space 1506 is provided to the server site 1104 for use in uploading and downloading audio files when URL's are broken. Storage space 1506 for the server site IPAN 1104 and other software programs can be stored externally or locally at the site.

Each network enabled audio device 1510 has storage space 1512 for a playlist 1528, which is a list of audio files and associated URL's of where the audio files were retrieved from. Optionally, the associated URL's can be archived for only file formats that are streaming audio or MP3. Multiple playlists can be stored on the storage space 1512. In addition

to the playlist 1528, the actual audio files listed in the playlist are also stored in the storage space 1512. The audio files can be streaming audio, Windows Media Audio (WMA), and other audio formats. The network enabled audio device 1520 performs the same functions as the network enabled audio device 1510 with the storage space 1522, the playlist 1530, the network-enabled audio device IPAN software 1526, and songs and associated URL's.

The PC client 1508 has a storage space 1524 for a playlist 1534 and associated URL's and songs in the playlist. PC IPAN client software 1532 is also stored on the storage space 1524. The PC client 1508 includes a web browser (e.g., Microsoft Explorer, Netscape Navigator, etc.), an IPAN plug-in to the web browser, and an IPAN active tray software module.

The IPAN plug-in opens as soon as the web browser is opened. The IPAN plug-in affects the handling of links to MP3 files, streaming audio, and any other audio file type designated. Whenever a user selects, saves, or opens a file in the web browser, the IPAN plug-in intercepts the normal processing of the web browser and will check to see if the file is an audio file. If the file is an audio file, the IPAN plug-in will allow the user to download the audio file to the IPAN 1100 now or to schedule the file for download at a later time. In either case, the URL can be added to the playlist. Further, the IPAN plug-in will periodically connect to the server site IPAN software 1433 to receive software upgrades or to upload updates of the audio files present on the client PC 1433.

The web browser can be used to connect to the server site 1104 and provide access to the server site IPAN software 1433. The IPAN active tray software module runs in the background when the PC client 1508 is turned on. Without the web browser being opened, the IPAN active tray software module can play audio files in playlists.

At the server site 1104, the user can access the server site IPAN software 1433 through a network connection to the server site IPAN 1104 and from the server site IPAN software 1433 the user can assign playlists to different devices such as the network-enabled audio device 1510, the network-enabled audio device 1520, or the client PC 1508. The user composes the playlists from the server site IPAN software 1433, but typically only stores the title of the song and the URL from which the song came. The playlists stored throughout the IPAN 1100 are also stored in the server site IPAN 1433. The user then has a master list of where all playlists are located. When the device 1510 connects to the server site IPAN 1104, a playlist is assigned to it. Within the playlist, the URL's indicate the location from which the audio files associated with the song titles in the playlist can be downloaded. The network-enabled audio device 1510 then proceeds to download the song from the given site specified by the URL to the disk space 1512 on the device 1510. If the site at the URL is not working, the server site IPAN software 1433 will upload the playlist from the disk space 1522 of another device 1520 the next time the second device 1520 connects to the network. The next time the original device 1510 calls in, it will download the playlist from the server site 1104.

Further, the server downloads software upgrades, if necessary, when the device accesses the IPAN 1433. For example, if the disk space in a device that was supposed to have a playlist was accidentally erased, then the server site 1104 provides the URL's for sites to download the lost playlists. In addition, the server site 1104 downloads any other software used to enhance the communications between the server and the device. Software can also be downloaded to be used by the CPU 1402 or the Support Chip CPU 1406.

In one embodiment, there is no server site 1104. The PC IPAN client software 1532 stores the playlists that are located throughout the IPAN 1100. Through a network connection, the PC IPAN client software assigns playlists to devices 1510 and 1520.

FIG. 16 illustrates the connection steps used when the user first sets up the network-enabled audio device. A user begins at process block 1601 by connecting the speakers and radio antennas to the back of the unit. The user also takes other preparatory measures such as plugging in the AC power cord and connecting a phone cable to a telephone jack. At the next process block 1602, the user can choose to begin listening to preloaded music without setting up any of the software by pressing the power button 1204 on the machine and pressing the "Listen Now/Setup Later" button on the first screen. The user can thus listen to preloaded music before even setting up the software for the network-enabled audio device. The process then advances to the next process block 1603 where the user can scroll through the playlists of preloaded music by using the shuttle control 1214 and the enter button 1216. At the next process block 1605, the user begins to set up the network-enabled audio device 1200 by inserting a setup CD into the CD player 1220. The process advances to process block 1606 where the user returns to the first screen and selects "Setup Now" in order to begin loading the PC IPAN client software 1532 on the network-enabled audio device 1200.

FIGS. 17A through 17I show various displays provided by the PC IPAN client software 1532 and the server site IPAN software 1433. In one embodiment, these displays are produced by web pages provided by the server and display on the user's PC in a web browser. FIG. 17A illustrates a Playlist Manager window 1700 that appears when a user runs the PC IPAN client software 1532 and the server site IPAN software 1433. The user-control buttons in the Playlist Manager window include a client feature control button 1702, an audio player window button 1704, a create new playlist button 1706, a delete button 1708, a schedule button 1710, a play button 1712, a scan hard drive button 1714, an add device button 1716, and a synchronize button 1718. Personal Audio Information Tabs 1726 allow the user to view classifications for audio such as by artist or playlist. The display playlist and song button 1740 provides access to audio and devices such as PC's, network-enabled audio devices 1200 and 1300, portable audio devices, etc. Access is provided as a tree control in the playlist window 1780. The playlist window 1780 displays playlists, the title window 1720 displays songs in the playlist, an arrow button 1760 provides for addition of songs to playlists, and an arrow button 1799 provides for deletion of songs from playlists.

The Client Feature control button 1702 allows the user to select a desired playlist or other audio source to listen to. The client feature control button also allows the user to control the look and feel of the window such as color and background designs ("skins") etc. The user clicks the play button 1712 to play a selection. To control the volume, shuffle, repeat, and other playback functions, the user clicks the audio player window button 1704. A new popup window appears with buttons for each of those functions. In addition to choosing a playlist, the user can compose a new playlist. The user clicks the new playlist button 1706 to create a new playlist by artist, album, or genre. The user can scan the PC's hard drive for music to incorporate into a playlist by clicking the scan button 1714. The user can also add a device to the IPAN 1433 by clicking the add device button 1716.

To help manage playlists and devices, the Playlist Manager 1700 provides personal audio information tabs 1726. The

devices that can be managed include network-enabled audio devices 1200 and 1300, PC's, portable MP3 players, cell phones, etc. With the personal audio information tabs 1726, the user can view and manage the devices, playlists, and audio classifications by "All," "Playlist," "Album," "Artist," "Genre," "Books," or "Clips." The playlist window 1780 lists the playlists selected by the personal audio information tabs 1726. The title window 1720 lists the songs in a playlist selected in the playlist window 1780. Songs are added to a playlist listed in the playlist window 1780 using the arrow button 1760 and removed from a playlist listed in the playlist window 1780 using the arrow button 1799. The user deletes audio files from the IPAN 1100 by selecting the file and pressing the delete button 1708. Further, the user can schedule playlists or streams to be heard at designated devices and at designated times by using the schedule button 1710. The user can synchronize with the server site IPAN 1433 by clicking the synchronize button 1718. Playlists are stored on the server site IPAN 1433 in addition to the PC IPAN client 1508 or device 1510. In other words, a playlist may have been updated at the server site IPAN 1433 by adding or deleting some songs in the playlist. The user can choose to have the same playlist with two different songs at the server site 1104 and on the device 1200 or 1300. But, if the user made the playlist at the server site IPAN 1433, the user presses the synchronize button 1718 so that the next time the device 1200 or 1300 connects, an updated playlist will be downloaded. To access a playlist or the playlists on a particular device, the user clicks the display button 1740.

FIG. 17B illustrates the display of an audio player window 1792 that includes a previous track button 1782, a play button 1784, a stop button 1786, and a next track button 1790. The audio player window 1792 is invoked by pressing the audio player window button 1704. A volume indicator 1794 displays the current volume. The user can click on the volume indicator 1794 to drag it higher or lower to a different volume. The user can click the shuffle button 1796 to "randomize" the playlist as opposed to playing the playlist in the same order. Further, the user can press the repeat button 1798 in order to have continuous play as opposed to the playlist stopping when it runs out of songs to play. The playlists will typically start from the beginning.

FIG. 17C illustrates the display of the audio player window 1700 showing popup menus that appear when the user attempts to assign a highlighted playlist to another device. After the user highlights a song, the user can right-click on the song in order to have a popup menu 1761 appear with a variety of options such as "Load," "Play," "Blast To," "Copy To," "Make Available On," and "Delete." The user can choose the menu option of "Make Available On" to assign the playlist from one device to another, (e.g. from device 1510 to device 1520). The addition of the device 1510, the device 1520, a portable player, a PC, etc. to the IPAN 1100 will be discussed with reference to FIG. 17I. Once the "Make Available On" option is chosen, another window 1762 appears with options of devices for the playlist to be assigned to. In FIG. 17C, the playlist is assigned to "Living Room iRad-S" instead of "Office Desktop computer," "Portable Player," or "Home Desktop Computer."

FIG. 17D illustrates one embodiment of how the list of songs in a playlist is displayed. A speaker icon 1762 is used to indicate a local audio file. In other words, the audio file is located on some storage space within one of the devices (e.g., a network enabled audio device 1200 or 1300, a PC, a portable player, etc.). A speaker outline icon 1763 indicates a link to an audio file located elsewhere on another device within the

IPAN 1100. The link can be clicked in order to see what other devices, if any, the file is located on.

FIG. 17E illustrates a scheduling window 1763 that opens in response to the pressing the schedule button 1710. The user can schedule playlists to be played at a particular time and on a particular device. The network-enabled audio device will automatically turn on at the scheduled time and play the given playlist. The user controls can be disabled in order to prevent a user at a remote location from changing the music scheduled to be played at the given time. Optionally, the user controls can be disabled in order to prevent the network-enabled audio device from being turned off. The scheduling window 1763 allows a user to highlight dates on a calendar and choose devices from menus to be played at a specific time. The user can also choose to interactively play the selected playlist on a day of the week at a particular time. For example, the user can choose to have a selected playlist played every Monday, Tuesday, Wednesday, Thursday, and Friday at 6 p.m.

FIG. 17F illustrates a popup menu for selecting the default look and feel ("skin") of the IPAN client 1508. The user accesses the "skin" option by pressing the client feature control button 1702 and the client feature control menu 1764 appears. After the user selects "skin" from the client feature control menu 1764, a "skin" menu 1765 appears to provide different "skin" options such as, for example, "Default," "Executive," "Space," "Sixties," and "Post Industrial." FIG. 17G shows that the "skin" menu 1765 also provides a "Get More Skins" option to allow the user to see other "skins" besides the ones listed in the "skin" window 1765.

FIG. 17H shows how the user can choose to "blast" a playlist of the existing audio files from a device, such as a portable player, and replace them with a new playlist in one easy process. In other words, the user can delete the existing audio files from a playlist without deleting the playlist name and substitute new audio files for the old audio files. After the user selects a song, the user right-clicks on the song to open a window 1766 with the option "Blast To." When the "Blast to" menu item is selected, a popup menu 1767 appears to provide the user with a list of devices that the music can be "Blasted" to. Devices such as the network-enabled audio devices 1200 and 1300, PC's, portable players, etc. can be "Blasted" to.

FIG. 17I illustrates a pop up window 1779 for adding a device to the IPAN. A plurality of fields 1771-1774 and a plurality of fields 1775-1778 are provided to allow the user to enter information concerning the new device to be added. The user enters the name of the new device to be added in the field 1771; the serial number of the device in the field 1772; the device type of the new device in the field 1773, the connection point in the field 1774; the time to automatically download to the new device in the field 1775; the maximum time for download duration in the field 1776, and a folder for receiving files in the field 1778. In addition an OK button 1791 and a Cancel button 1792 are provided. Finally, there is a download box 1793 that is checked to have new files and updates automatically downloaded to the device when it is connected to the IPAN 1100. A device can become a dedicated MP3 server by downloading files to the device every time an audio file is downloaded to any other device.

The user selects the type of device in the field 1773 from a list of devices supported by the IPAN 1100. The user may have more than one type of device in the IPAN 1100. Therefore, the user can enter a name in the field 1771 and the serial number in the field 1772 to distinguish similar devices. If the user designates a portable device, the device which the portable device will be connected to is entered in the field 1774 to provide the IPAN with information about how to access the portable device. The download time is entered in the field

1775 to provide the IPAN with the time when the user would like the device to automatically download. The default time is set to early morning (e.g. between midnight and 5 a.m.) because that is the time when the least amount of people are on the telephone and the Internet. The download duration is entered into the field 1776 to provide a maximum time limit for download duration if desired. The default is unlimited, but the user can set a maximum time so that if the download is not finished within the time limit, the device signs off. Before signing off, the current task will be completed. In other words, if the maximum time is exceeded in the middle of downloading the third song in a download of ten songs, the task of downloading the third song will be completed. The download will continue where it left off upon initiation of the next download command. In the previous example, the download will continue at the fourth song. Finally, the server site IPAN software 1433 will automatically install downloaded files in a designated folder unless the user specifies a different location in the field 1778.

FIGS. 18A through 18H illustrate the use of the display 1800 on the network-enabled audio device. In FIG. 18A, the screen display 1802 includes a "Radio" menu item 1804, a "Playlist" menu item 1806, a "Favorites" menu item 1808, a "Jukebox" menu item 1810, a "CD" menu item 1812, and an "Internet Radio" menu item 1814. Residing in the lower portion of the display 1800, the menu buttons 1821-1825 are in the group of menu buttons 1212 and are provided to correspond to icons 1841-1845 residing in the lower portion of the display 1800. Each one of the icons 1841-1845 represents a different function to be performed with respect to a selected audio source.

The user selects items from the screen display 1802 by using the shuttle control 1214 and the enter button 1216. For example, to select the "CD" audio source, the user presses right shuttle control 1264 until the "CD" menu item is highlighted. The user then presses the enter button 1216. Once an audio source is selected, context sensitive icons 1841-1845 appear above the corresponding menu buttons 1821-1825. Depending on the chosen audio source, the icons 1841-1845 represent different functions.

FIG. 18B illustrates the screen display 1802 when the audio source is an AM/FM radio, such as the AM/FM "Radio" menu item 1804. The menu item 1804 is highlighted to indicate that the AM/FM "Radio" audio source has been chosen. The menu buttons 1821-1825 change context to correspond to icons that represent functions related to the audio source selected. Because the AM/FM "Radio" audio source was selected, the menu buttons 1821-1825 change context to correspond to the icons for an AM/FM tuner. The icons 1841-1845 shown as, respectively, a play icon 1841 corresponding to a play function 1830, a scan next icon 1842 corresponding to a scan next function 1832, a scan previous icon 1843 corresponding to a scan previous function 1834, a radio presets icon 1844 corresponding to a radio presets function 1836, and a stop icon 1845 corresponding to a stop function 1838. As further illustrated in FIG. 18C, if the menu button 1823 corresponding to the icon 1844 representing the radio presets function 1836 is pressed, the menu buttons 1821-1825 change context to correspond to icons 1841-1845 which represent the choice of preset stations with each of the functions 1870-1874 corresponding to a different radio station. In one embodiment, the radio source menu option 1804 is omitted.

FIG. 18D shows the screen display 1802 after the user has selected the Playlist menu item 1806. The menu buttons 1821-1825 are used to select from various playlist icons 1841-1845. The icons 1841-1845 shown as, respectively, a play icon 1841 corresponding to a play function 1875, a

record icon 1842 corresponding to a record function 1876, an export icon 1843 corresponding to an export function 1877, and back to previous menu icon 1845 corresponding to a back to previous menu function 1878. The shuttle control 1214 and the enter button 1216 are used to select a song from the playlist in order to play. The record function 1876 will record a playlist to the network-enabled audio device's storage device 1510. The export mode downloads the playlist to a portable player. After a song is chosen from a playlist in FIG. 18D, FIG. 18E shows the menu buttons 1821 and 1822 changing context to correspond to icons 1840 and 1841. The icons 1841 and 1842 are shown as, respectively, a delete icon 1841 corresponding to a delete function 1848 and a back to previous menu icon 1850 corresponding to a back to previous menu function 1850.

FIG. 18F illustrates the Jukebox audio source 1810, which provides a listing of all the audio files stored on the hard drive 1512 of the network enabled audio device 1510 by Title, Artist, Album or Genre. The menu buttons 1821 and 1822 change contexts to correspond go icons 1840 and 1841. The icons 1841 and 1842 are shown as, respectively, a play icon 1849 corresponding to a play function 1849 and a back to previous menu icon 1851 corresponding to a back to previous menu function 1851.

FIG. 18G illustrates the CD audio source 1812 being selected. The menu buttons 1821-1823 change context to correspond to icons 1841-1843. The icons 1841-1843 are shown as, respectively, a Name CD icon 1841 corresponding to a Name CD function 1852, a Record CD icon 1842 corresponding to a Record CD function 1854, and a back to previous menu icon 1843 corresponding to a back to previous menu function 1856. The Record CD function 1854 can be used to copy tracks from a CD to the hard drive 1512 for future use in playlists. The Name CD function 1852 is used to retrieve a title name for a track and other information via the Internet from a CD database site after the Record CD function 1854 has been used to copy the CD to the hard drive. In one embodiment, an online database is checked via the Internet.

In FIG. 18H, when the CD player is being played, menu buttons 1821-1825 change context to correspond to icons 1841-1844. The icons 1841-1845 are shown as, respectively, a previous track icon 1841 corresponding to a previous track function 1892, a pause icon 1842 corresponding to a pause function 1894, a next track icon 1843 corresponding to a next track function 1896, and a stop icon 1844 corresponding to a stop play function 1898.

FIG. 19A is a flowchart that illustrates an audio query process 1900 of the IPAN 1100. The audio query process 1900 begins at start block 1940 where the PC IPAN client software 1532 is opened. In one embodiment, a portion of the PC IPAN client software 1532 is part of the "active tray" so that when a user turns the PC 1508 on, the PC IPAN client software 1532 is opened. Further, a portion of the PC IPAN client software 1532 is part of the IPAN plug-in so that when an Internet or other network connection is established, the PC IPAN client software 1532 runs in the background to query whether to add an audio file found on the Internet to the server site IPAN 1104. The process advances to a process block 1942 where the user finds a desired audio file as addressed by a URL. The user can search the Internet for audio without having to access the web site associated with the server site 1502. In a decision block 1944, the user is asked, through a menu, if the file is to be downloaded. If the process advances to a process block 1948, the user has decided to download the file now and the playlist is added to the IPAN 1100. At a process block 1950, the file has been downloaded and is available for playing. If the user decides "NO" (i.e. to down-

load the file at a later time or at the default time) the process advances to a process block 1946 to download the file at that default or more convenient time. The process then advances to a process block 1948 when the file is added to the IPAN 1100. The web site associated with the server site 1104 does not have to be opened. The PC IPAN client software 1532 will download the software to the hard drive of the PC 1508 and connect to the web site associated with the server site 1508 to upload the audio files. At the final process block 1950, the audio files will be available for playing.

FIG. 19B is a flowchart 1900 that begins at start block 1902 and illustrates the assignment of playlists to devices. The process advances from the start block 1902 to a process block 1904 where the user logs into the server site IPAN 1433. The process advances to the next process block 1908 where the user assigns a playlist to a first device 1510. In one embodiment, the playlist is stored in an SQL database and accessed via active server pages. After the active server pages access the SQL database, the playlist is downloaded to the first device 1510. The process then advances to a decision block 1908 where the process checks to see if all the songs in the playlist are stored in the first device's hard drive 1512. If all the songs in the playlist are already on the first device 1510, the songs on device 1510 are catalogued as being present. If songs need to be downloaded, the server site IPAN 1433 forms a list of remaining songs. In the next process block 1910, the server site IPAN 1433 compares the list of remaining songs to its records of the songs present on the device 1520 to see if the device 1520 has some of the necessary songs to complete the playlist formation. If the second device 1520 does have some of the remaining songs, the URLs of those songs, which are stored on the Server site IPAN, are provided to the first device 1510. The remaining songs which the second device 1520 does not have are deleted from the list of remaining songs and do not become part of the playlist. In the next process block 1914, the first device 1510 will download the songs from the URLs provided to it by server site IPAN 1433. The first device 1510 downloads all of the remaining songs needed for the playlist from the second device's 1520 URL's, but if all the songs are not on the second device's 1520 playlist, the first device 1510 will either get them from another device or in the worst case compose a playlist from only the songs that could be retrieved.

In the decision block 1916, the process determines if any URLs are broken. If A is unable to download the files from the URLs, the server site IPAN 1433 will upload the files to the server site in process block 1920, store the files in the interim, and download the files to the first device 1510 in process block 1922 the next time the first device 1510 calls in. For instance, the first device 1510 can be located on the east coast, and the second device 1520 can be located on the west coast. The first device 1510 may be assigned a playlist that is stored on the disk drive 1522 of the second device 1520. When the first device connects (e.g., at 2 a.m.) to the server site IPAN 1433, the first device will receive the URL's for the location where the second device 1520 downloaded the audio files and now the first device 1510 can download the audio files. If the URLs are broken, the first device 1510 will disconnect. When the second device 1520 calls in three hours later at 2 a.m. Pacific Time, the server site IPAN 1433 will upload the audio files to the server site 1104 and store the files on the disk space 1506. When the first device 1510 connects at 2 a.m. the following evening, the audio files will be ready to download from the server site 1104 to the first device 1510. The audio files will finally be stored on the disk space 1512.

At process block 1922, the songs that are present on the device 1510's storage space, the songs that have been down-

loaded from URL's to the device 1510, and the songs that have been uploaded to the device 1520 are catalogued in the IPAN 1100. In one embodiment, the songs are catalogued in the IPAN 1100 at the time that they are found. For instance, the songs that are on the device 1510's hard drive found at the process block 1908 can be catalogued in the IPAN 1100 at that time rather than at process block 1922. Further, the songs downloaded from URL's can be catalogued at process block 1916 or decision block 1916. Finally, the songs uploaded from the device 1520 can be catalogued at the time of uploading at process block 1918 or at the time of downloading at process block 1920. Optionally, delays in cataloguing can be used. In one embodiment, for example, the uploaded songs and the downloaded songs are all catalogued at process block 1920 whereas the songs present on the device 1510's storage space are catalogued at the decision block 1908.

FIG. 19C is a flowchart 1980 that illustrates another embodiment of the process of flowchart 1900. In one embodiment, the flowchart 1980 has process and decision blocks that handle an assignment of a playlist that includes songs not present on the device 1510. The process advances from the start block 1902 through 1908 in the same fashion as the process in flowchart 1900. In contrast to the process in flowchart 1900, the process then advances to decision block 1990 rather than 1910. At decision block 1990, if songs need to be downloaded, the server site IPAN 1433 checks its records to see if the device 1520 has all the necessary songs on the list of remaining songs to complete the playlist formation. If the device 1520 has none or some but not all of the necessary songs, the process advances to a process block 1950. At the process block 1950, the necessary songs that are not present on the device 1520 are catalogued in the new playlist with empty cone icons next to those songs. Optionally, the icon can be a symbol other than an empty cone. The playlist is not yet completely formed and will have additions of songs that are present on the device 1520 at a later point in the process. The process then advances to a process block 1952 and deletes songs that the device 1520 does not have from the list of remaining songs. The process then advances to decision block 1954 to determine if the list of remaining songs is empty. If the list of remaining songs is empty, then the process advances to process block 1922 where the songs present on the device 1510's storage space 1512 are catalogued in addition to the missing songs that are catalogued. In one embodiment, cataloguing does not include multiple entries for songs determined to be present at an earlier time. For instance, if a song is present on a device and is catalogued once as being present on the device, a multiple entry for the song being present on the device will not be made at a subsequent iteration of the process. If the list of remaining songs is not empty, the process advances to the process block 1912. At the process block 1912, the process in the flowchart 1980 proceeds in the same fashion as the process in flowchart 1900 until the process advances to the process block 1922. After all the songs (including the missing songs) are catalogued at the process block 1922, the process advances to the process block 1960 where the list of remaining songs is deleted. At the process block 1962, if the playlist does not contain any songs with an empty cone icon, the playlist is complete and the process advances to the end process block 1924. If the playlist contains any songs with an empty cone icon, the process advances to the decision block 1964 to allow the user to delete the missing songs. If the user deletes the missing songs, the playlist is complete, and the process advances to the end process block 1924. If the user decides not to delete the missing songs, a new list of remaining songs is created con-

sisting of the missing songs not deleted by the user. The process then advances to the decision block 1990.

At the decision block 1990, if the device 1520 initially had all the remaining songs on the playlist, the process 1980 proceeds in the same fashion as the process 1900. In one embodiment, if the process advanced from the process block 1966 rather than 1908, the missing songs have been added to the storage space 1522 of the device 1520 so that the playlist can now be complete. The process advances through iterations until all the songs present on the playlist are present on the storage space 1512 of the device 1510 or until the user deletes songs from playlist so that no missing songs are present. In one embodiment, the process advances from the process block 1966 to the decision block 1908 in order to check whether the missing songs have been added to the storage space 1512 of the device 1510 or the storage space 1522 of the device 1520 so that the playlist can now be complete.

In one embodiment, the IPAN 1100 includes a network connection so that the first device 1510 and the second device 1520 can have audio files downloaded from the first device 1510 to the second device 1520 almost instantaneously after the assignment of an audio file to the device 1510. For example, in a home network, the device 1510 does not need to connect to the Internet and can retrieve the necessary file through the network connection.

FIGS. 20A-20F illustrate the use of the action button 1210 on the network-enabled audio devices 1200 or 1300. FIG. 20A illustrates the screen display 1802 before the action button 1210 has been pressed. In one embodiment, the action button 1210 can be pressed when an audio source (e.g. an audio source in MP3 file format) with an unidentified artist is playing. Optionally, the action button 1210 can be pressed when an audio source in MP3 file format with an identified artist is playing. Optionally, the action button 1210 can be pressed for audio sources such as, for example, streaming audio, files in WMA file format, CDs, etc. The menu buttons 1821-1825 represent the functions that can be performed on the given audio source before the action button 1210 is pressed. For an MP3 file, for example, the menu buttons 1821-1825 correspond to a "pause" function, a "next" function, a "previous" function, an "add favorites" function, and a "stop" function. After the action button 1210 is pressed, the menu buttons 1821-1825 change context to perform functions that provide additional information on the given audio source and artist. Further, after the action button 1210 is pressed, the artist will no longer be shown as "unknown" because the audio source will be uploaded to a server for analysis to determine the identification of the artist. The server will download the identity of the artist in addition to other information concerning the audio source.

FIG. 20B illustrates the screen display 1802 after the action button 1210 has been pressed. The "unknown" artist in FIG. 20A has been determined to be "Moby," and the unidentified MP3 file has been identified as "Porcelain." The menu buttons 1821-1825 correspond to menu items that provide information on, or related to, the audio source. A title menu 2002 is provided to indicate the location in the directory of action button options that the user has chosen. If the user is at the beginning of the action button directory structure, the screen display 1802 illustrates the text "action" in the title menu 2002.

The menu buttons 1821-1825 correspond to the menu items "news," "music," "tour," "offers," and "done." By choosing the menu item "news," information will be presented to the user of current events regarding the artist and/or the given audio source. For instance, the "news" function can

display Billboard top 40 information, clothing lines introduced by the artist, new albums, etc. The menu button 1822 corresponding to the "music" menu item provides the user access to other audio sources from a given artist. The menu button 1823 corresponding to the "tour" menu item allows the user to get up-to-date information on tours that the artist is going on. The menu 1824 corresponds to the "offers" menu item which allows the user to receive information on merchandise, promotional items, etc. for the given artist. The menu button 1825 corresponding to the "done" menu item allows a user to turn off the action button 1210.

FIG. 20C illustrates the screen display 1802 after the menu item "music" has been chosen. The menu path 2204 lists "action" to indicate to the user that the menu title "music" 2202 was a menu item chosen from the menu items illustrated in the screen shot denoted by the menu title "action." The menu buttons 1821-1825 correspond to the menu items "albums," "similar," "samples," "back," and "done." If the user selects the "albums" menu item the user will be able to view a list of other albums by the artist of the audio source. In one embodiment, the server downloads the albums listing when the action button 1210 is pressed for the first time. Optionally, the server downloads additional information after the user selects one of the menu buttons 1821-1825. When the user presses the menu button 1822, the "similar" menu item is chosen and a listing of albums that are from a genre of music similar to that of the audio source or from artists that are in some way similar to the artist of the audio source is presented. If the "similar" menu item is performed on Moby and "Porcelain," a list of techno songs from Moby and/or techno songs from other artists can be presented. If the user presses the menu button 1823 corresponding to the "samples" menu item, audio samples from the artist will be presented. If the user presses the menu button 1824 corresponding to the "back" menu item, the location illustrated in the menu title is returned to. If the user presses the menu button 1825 corresponding to the "done" menu item, the action button 1210 is turned off.

FIG. 20D illustrates the screen display 1802 after the menu item "albums" has been chosen. The menu path 2204 lists "action/music" to indicate to the user that the menu title "albums" 2202 was a menu item chosen from the menu items illustrated in the screen shot denoted by the menu title "music." The menu buttons 1821-1824 correspond to different albums for the given artist. FIG. 20D illustrates four of Moby's albums: "Moby," "Ambience," "Everything is Wrong," and "Animal Rights." The menu button 1825 corresponds to the "done" function which allows the user to turn the action button 1210 off.

FIG. 20E illustrates the screen display 1802 after the menu item "Ambient" is chosen on the screen display 1802 illustrated in FIG. 20D. The menu path 2204 action/music/albums shows that "Ambient" was chosen from the menu title "albums" 2202. The menu item "buy" is chosen to purchase the album "Ambient." The menu item "download" is chosen to download the "Ambient" album. The menu item "listen" is pressed to allow the user to listen to the album. The menu item "back" allows the user to access the previous menu title. To reach the screen shot with the menu title "albums" from the menu title "Ambient," the user chooses the "back" menu item. The user can turn the action button off by pressing the "done" menu item.

FIG. 20F illustrates the screen display 1802 after the user determines to buy the album illustrated in FIG. 20E. The menu path action/music/albums/buy indicates that the user chose the "buy" menu item in FIG. 20E. The title menu 2202 "complete" is used at the end of the transaction. The menu

item "buy" can be chosen to allow the user to complete the transaction. To reach the screen shot with the menu title "Ambient" from the menu title "Complete," the user chooses the "back" menu item. The menu button 1825 corresponds to the menu item "done" which allows the user to turn the action button 1210 off.

In FIG. 20B, if the menu item "news" is chosen by the user, the subsequent screen will display the menu path "action," the menu title "news," and the menu items: "listen," "read," "log to myactions," "back," "done." If the user chooses the menu item "read," a subsequent screen displays the menu path "action/news," the menu title "read," and the menu items "log to myactions," "back," and "done." If the user chooses the menu item "log to myactions," information about a particular artist or a particular audio source will be stored in a log for future reference. The displayed menu path will be "action/news/to myactions," the menu title will be "complete," and the menu items will be "back" and "done."

If instead of reading the news, the user would like to listen to the "news," the "listen" menu item can be chosen in the screen displaying the "action" menu path and the "news" menu title. The next screen will display the "action/news" menu path and the "listen" menu title. The screen will also alert the user as to the status of the retrieval of the news. The menu items include "log to myactions," "back" and "done."

In FIG. 20C, the user can choose the menu item "samples" so that the next screen displays the menu path "action/music," the menu title "samples," and the menu items which include different audio source samples. After the user chooses a sample from the menu items of samples, a screen displays the menu path "action/music/samples," the title menu "Ambient," and the menu items "buy," "download," "listen," "back," and "done." If the user chooses to select the "buy" menu item, the next screen displays the menu path "action/music/samples/buy," the menu title "complete," and the menu items "back," and "done."

In FIG. 20B, if the user decides to select the menu item "tour," the next screen will display the menu path "action," the menu title "tour," and the menu items "appearing," "log to myactions," "back," and "done." If the user selects the menu item "appearing," the next screen will display a location or locations of tours for the given artist. For example, when the user presses "tour" for "Moby," the screen can display "Dec. 13, 2000 Verizon Amphitheater Irvine Calif." The screen will also display the menu title "appearing" and the menu items "log to myactions," "back," and "done." If the user selects the "log to myactions" menu item, the next screen displays the menu path "action/tour/appearing," the menu title "complete" and the menu items "log to myactions," "back," and "done."

In FIG. 20B, if the user selects the "offers" menu item, the next screen displays the menu path "action," the menu title "offers," and the menu items "merch," "special," "back," and "done." If the user selects the menu item "merch," the next screen displays the menu path "action/offers," the menu title "merchandise," and the menu items "item one," "item two," "item three," "back," and "done." If the user selects the menu item "item one," the next screen displays the menu path "action/offers/merchandise," "item one," and the menu items "buy," "log to myactions," "back," and "done." If the user selects "buy," the next screen displays the menu path "action/offers/merchandise/buy," the menu title "complete," and the menu items "buy," "back," and "done." The screen also displays the artist and the item selected. For example, the screen displaying "Moby, Item 1" indicates that the user bought Item 1 by Moby. If instead of buying Item 1, the user wishes to keep a log of Item 1 for future reference, the user can upload that

future reference to a server. For instance, in the next screen, the menu path can be "action/offers/merchandise/to myaudioramp." The menu title is "complete," and the menu items are "back" and "done."

In FIG. 20C, if the user decides to choose "similar" music, the next screen displays the menu path "action/music," the menu title "similar," and the menu items that include audio sources similar to that of the artist with the given audio source. Menu items that can appear on the screen for "Moby," for example, are "808 state," "air," "aphex," "back," and "done." If the user decides to select the menu item "808 state," the next screen displays the menu path "action/music/similar," the menu title "808 state," the menu items "buy," "download," "listen," "back," and "done." If the user decides to buy "808 state," the next screen displays the menu path "action/music/similar/buy," the menu title "complete," and the menu items "back" and "done."

In FIG. 20C, if the user decides to select the menu item "samples," the next screen displays the menu path "action/music," the menu title "samples," and the menu items that include audio source samples of the given album. The menu items for "Moby" can include "Moby," "Ambient," "Everything is Wrong," "Animal Rights," and "done."

In FIG. 20C, if the user selects the menu item "similar," the next screen displays the menu path "action/music/similar," the menu title "listen," and the menu items "back" and "done." The user can also choose to download the similar music. The next screen displays the menu path "action/music/similar," the menu title "download," and the menu items "back" and "done."

In FIG. 21, after the action button 1210 is pressed, the audio-enabled device 1200 or 1300 can at times play advertisements. For a Nike advertisement, the text "Nike" would be displayed on the first line of the screen. The text of the advertisement, such as "radio free Sydney, air max knukini offer," can be displayed underneath the "Nike" text. The menu title "action" 2002 is displayed and the menu items "buy," "log to myactions," "more info," "offers," and "done" are displayed. If the user decides to buy the products offered in the advertisement, the next screen displays the menu path "action/buy," the menu title "complete," the menu items "back" and "done," and the advertisements are displayed. If the user decides instead to store the offer for a future reference, the menu path "action/to myaudioramp" is displayed in addition to the menu title "complete," and the menu items "back" and "done" are displayed. If the user wishes to receive more information, the "more info" menu item can be chosen. The menu path "action/more info," the menu title "more info," and the menu items "buy," "log to myactions," "offers," and "done" are displayed.

While the above description contains many specifics, these should not be construed as limitations on the scope of the invention, but rather as an exemplification of preferred embodiments thereof. The various user controls and buttons can be relocated, combined, reconfigured, etc. Most of the user controls and buttons can even be omitted entirely in favor of voice-activated commands. One skilled in the art will recognize that many of the various features, and capabilities described in connection with the intelligent radio 100, are also applicable to other embodiments as well, including the embodiments described in connection with FIGS. 7-10 and the network-enabled audio device in FIGS. 13A-21. One skilled in the art will also recognize that other embodiments are contemplated, including, for example, handheld intelligent radios, and intelligent radios for boats, cars, trucks, planes, and other vehicles, etc.

One skilled in the art will recognize that these features, and thus the scope of the present invention, should be interpreted in light of the following claims and any equivalents thereto.

The invention claimed is:

1. An electronic device comprising:

a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively couple the electronic device to a central system;

b) a system enabling playback of audio content from a playlist assigned to the electronic device via the central system; and

c) a control system associated with the network interface and the system enabling playback of the audio content indicated by the playlist, and adapted to:

i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;

ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and

iii) when the desired mode of operation is the playlist mode of operation:

receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;

receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;

obtain the ones of the plurality of songs from the at least one remote source; and

play the audio content indicated by the playlist.

2. The electronic device of claim 1 wherein the control system is further adapted to enable playback from a broadcast radio source.

3. The electronic device of claim 1 wherein the control system is further adapted to enable playback from an optical disc.

4. The electronic device of claim 1 further comprising a data storage device, wherein the control system is further adapted to enable playback from the data storage device.

5. The electronic device of claim 1 wherein the control system is further adapted to provide an alarm clock mode.

6. The electronic device of claim 1 wherein the control system is further adapted to:

display a list of Internet radio broadcast stations.

7. The electronic device of claim 1 further comprising a wireless transceiver communicatively coupled to the control system.

8. The electronic device of claim 1 wherein the electronic device is further adapted to receive input from a wireless remote control having a navigation shuttle.

9. The electronic device of claim 1 wherein the control system is further adapted to:

enable the user of the electronic device to receive information on promotional items for the plurality of songs in the playlist.

10. The electronic device of claim 1 further comprising at least one speaker.

11. The electronic device of claim 1 wherein the control system is further adapted to:

a) send a request to a remote server for supplemental information related to a song in real-time while the song is playing;

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- b) receive the supplemental information from the remote server; and
  - c) present the supplemental information to the user of the electronic device.
12. The electronic device of claim 11 wherein the supplemental information comprises information enabling the user to listen to samples of a plurality of songs.
13. The electronic device of claim 1 wherein the control system is further adapted to:
- receive and display a recommended song.
14. The electronic device of claim 13 wherein the control system is further adapted to:
- provide an option to listen to the recommended song.
15. The electronic device of claim 13 wherein the control system is further adapted to:
- provide an option to purchase the recommended song.
16. The electronic device of claim 1 wherein playback of the playlist when in the playlist mode of operation is triggered by at least one user settable schedule.
17. The electronic device of claim 16 wherein there are a plurality of user settable schedules.
18. The electronic device of claim 17 wherein at least one of the plurality of user settable schedules is specified by information that comprises a time of day.
19. The electronic device of claim 18 wherein information that specifies the at least one of the plurality of user settable schedules further comprises a day of the week.
20. The electronic device of claim 18 wherein information that specifies the at least one of the plurality of user settable schedules further comprises information that specifies a playlist.
21. An electronic device comprising:
- a) a network interface enabling the electronic device to receive an Internet radio broadcast and being further adapted to communicatively couple the electronic device to a central system;
  - b) a system enabling playback of audio content from a plurality of additional content sources comprising a playlist assigned to the electronic device via the central system; and
  - c) a control system associated with the network interface and the system enabling playback of the audio content from the plurality of additional content sources, and adapted to:
    - i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a plurality of additional modes of operation each corresponding to one of the plurality of additional content sources;
    - ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and
    - iii) play the audio content from one of the plurality of additional content sources when the desired mode of operation is a corresponding one of the plurality of additional modes of operation, where when in a playlist mode of operation, the control system is further adapted to:
      - receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;
      - receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;

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- obtain the ones of the plurality of songs from the at least one remote source; and
  - play the audio content indicated by the playlist.
22. The electronic device of claim 21 wherein the plurality of additional content sources further comprises a data storage device of the electronic device.
23. The electronic device of claim 21 wherein the control system is further adapted to provide an alarm clock mode.
24. The electronic device of claim 21 wherein the control system is further adapted to:
- display a list of Internet radio broadcast stations.
25. The electronic device of claim 21 further comprising a wireless transceiver communicatively coupled to the control system.
26. The electronic device of claim 21 wherein the electronic device is further adapted to receive input from a wireless remote control having a navigation shuttle.
27. The electronic device of claim 21 wherein the system further enables playback from an optical disc.
28. The electronic device of claim 21 wherein the plurality of additional content sources include a broadcast radio source.
29. The electronic device of claim 21 wherein the plurality of additional content sources include an optical disc source.
30. The electronic device of claim 21 wherein the control system is further adapted to:
- enable the user of the electronic device to receive information on promotional items for the plurality of songs in the playlist.
31. The electronic device of claim 21 further comprising at least one speaker.
32. The electronic device of claim 21 wherein the control system is further adapted to:
- a) send a request to a remote server for supplemental information related to a song in real-time while the song is playing;
  - b) receive the supplemental information from the remote server; and
  - c) present the supplemental information to the user of the electronic device.
33. The electronic device of claim 32 wherein the supplemental information comprises information enabling the user to listen to samples of a plurality of songs.
34. The electronic device of claim 21 wherein the control system is further adapted to:
- receive and display a recommended song.
35. The electronic device of claim 34 wherein the control system is further adapted to:
- provide an option to listen to the recommended song.
36. The electronic device of claim 34 wherein the control system is further adapted to:
- provide an option to purchase the recommended song.
37. The electronic device of claim 21 wherein playback of the playlist when in the playlist mode of operation is triggered by at least one user settable schedule.
38. The electronic device of claim 37 wherein there are a plurality of user settable schedules.
39. The electronic device of claim 38 wherein at least one of the plurality of user settable schedules is specified by information that comprises a time of day.
40. The electronic device of claim 39 wherein information that specifies the at least one of the plurality of user settable schedules further comprises a day of the week.
41. The electronic device of claim 39 wherein information that specifies the at least one of the plurality of user settable schedules further comprises information that specifies a playlist.



42. A method of operation for an electronic device comprising:
- a) enabling a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;
  - b) playing an Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and
  - c) when the desired mode of operation is the playlist mode of operation:
    - i) receiving a playlist assigned to the electronic device via a central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;
    - ii) receiving information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;
    - iii) obtaining the ones of the plurality of songs from the at least one remote source; and
    - iv) playing audio content indicated by the playlist.
43. The method of claim 42 further comprising:
- a) receiving audio content from a broadcast radio source; and
  - b) playing the audio content from the broadcast radio source.
44. The method of claim 42 further comprising:
- a) obtaining audio content from an optical disc; and
  - b) playing the audio content from the optical disc.
45. The method of claim 42 further comprising:
- a) obtaining audio content from a data storage device of the electronic device; and
  - b) playing the audio content from the data storage device.
46. The method of claim 42 further including enabling the user to set an alarm.
47. The method of claim 42 further comprising displaying a list of Internet radio broadcast stations.
48. The method of claim 42 wherein obtaining the ones of the plurality of songs from the at least one remote source comprises receiving the ones of the plurality of songs from the at least one remote source via a wireless transceiver of the electronic device.
49. The method of claim 42 further comprising:
- receiving input from a wireless remote control that enables navigating the playlist.
50. The method of claim 42 further comprising enabling playback from an optical disc.
51. The method of claim 42 further comprising enabling the user of the electronic device to receive information on promotional items for the plurality of songs in the playlist.
52. The method of claim 42 further comprising playing the audio content through at least one speaker.
53. The method of claim 42 further comprising:
- a) sending a request to a remote server for supplemental information related to a song in real-time while the song is playing;
  - b) receiving the supplemental information from the remote server; and
  - c) presenting the supplemental information to the user of the electronic device.

54. The method of claim 53 wherein the supplemental information comprises information enabling the user to listen to samples of a plurality of songs.
55. The method of claim 42 further comprising receiving and displaying a recommended song.
56. The method of claim 55 further comprising providing an option to listen to the recommended song.
57. The method of claim 55 further comprising providing an option to purchase the recommended song.
58. The method of claim 42 wherein playing the audio content indicated by the playlist when in the playlist mode of operation is triggered by at least one user settable schedule.
59. The method of claim 58 wherein there are a plurality of user settable schedules.
60. The method of claim 59 wherein at least one of the plurality of user settable schedules is specified by information that comprises a time of day.
61. The method of claim 60 wherein information that specifies the at least one of the plurality of user settable schedules further comprises a day of the week.
62. The method of claim 60 wherein information that specifies the at least one of the plurality of user settable schedules further comprises information that specifies a playlist.
63. An electronic device comprising:
- a) a wireless transceiver communicatively coupling the electronic device to a base station, the wireless transceiver enabling the electronic device to receive an Internet radio broadcast and communicate with a central system;
  - b) a system enabling playback of audio content indicated by a playlist assigned to the electronic device via the central system;
  - c) a control system associated with the wireless transceiver and the system enabling playback of the audio content indicated by the playlist and adapted to:
    - i) enable a user of the electronic device to select a desired mode of operation from a plurality of modes of operation comprising an Internet radio mode of operation and a playlist mode of operation;
    - ii) receive and play the Internet radio broadcast when the desired mode of operation is the Internet radio mode of operation; and
    - iii) when the desired mode of operation is the playlist mode of operation:
      - receive the playlist assigned to the electronic device from the central system, the playlist identifying a plurality of songs, wherein ones of the plurality of songs are not stored on the electronic device;
      - receive information from the central system enabling the electronic device to obtain the ones of the plurality of songs from at least one remote source;
      - obtain the ones of the plurality of songs from the at least one remote source; and
      - play the audio content indicated by the playlist.
64. The electronic device of claim 63 wherein the control system is further adapted to provide an alarm clock mode.

\* \* \* \* \*

# **EXHIBIT 11**



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**Dakss et al.**

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(45) **Date of Patent:** **Aug. 30, 2011**

(54) **SYNCHRONIZATION AND AUTOMATION IN AN ITV ENVIRONMENT**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1211 days.

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(65) **Prior Publication Data**

US 2006/0031914 A1 Feb. 9, 2006

**Related U.S. Application Data**

(60) Provisional application No. 60/542,119, filed on Feb. 4, 2004.

Primary Examiner — William Trost, IV

Assistant Examiner — Omar S Parra

(51) **Int. Cl.**  
*H04N 7/173* (2011.01)  
*H04N 7/16* (2011.01)  
*H04N 7/00* (2011.01)

(57) **ABSTRACT**

(52) **U.S. Cl.** ..... 725/93; 725/135; 348/460; 348/461; 348/464

(58) **Field of Classification Search** ..... 725/32-36, 725/45, 46, 93-95  
See application file for complete search history.

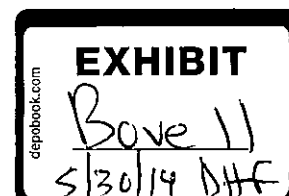
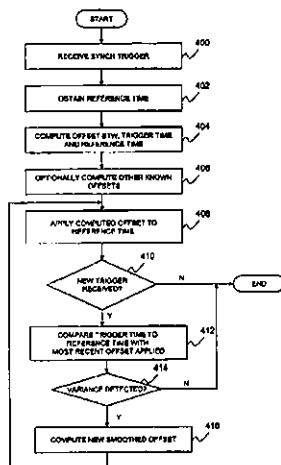
A synchronization mechanism embeds synchronization triggers into a television signal or stream at regular intervals. The triggers include an accurate representation of the time in which the triggers were embedded. A receiving device decodes the triggers and synchronizes its internal timer based on the triggers. In this regard, the receiving device obtains a reference time from the internal timer and computes an offset between the reference time and the trigger time. The computed offset is then applied to the reference time. With the receipt of each new trigger, the application compares the trigger time to a new reference time with the most recently computed offset value applied. If there is any variance between these two values, the application creates a new smoothed offset.

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**24 Claims, 4 Drawing Sheets**



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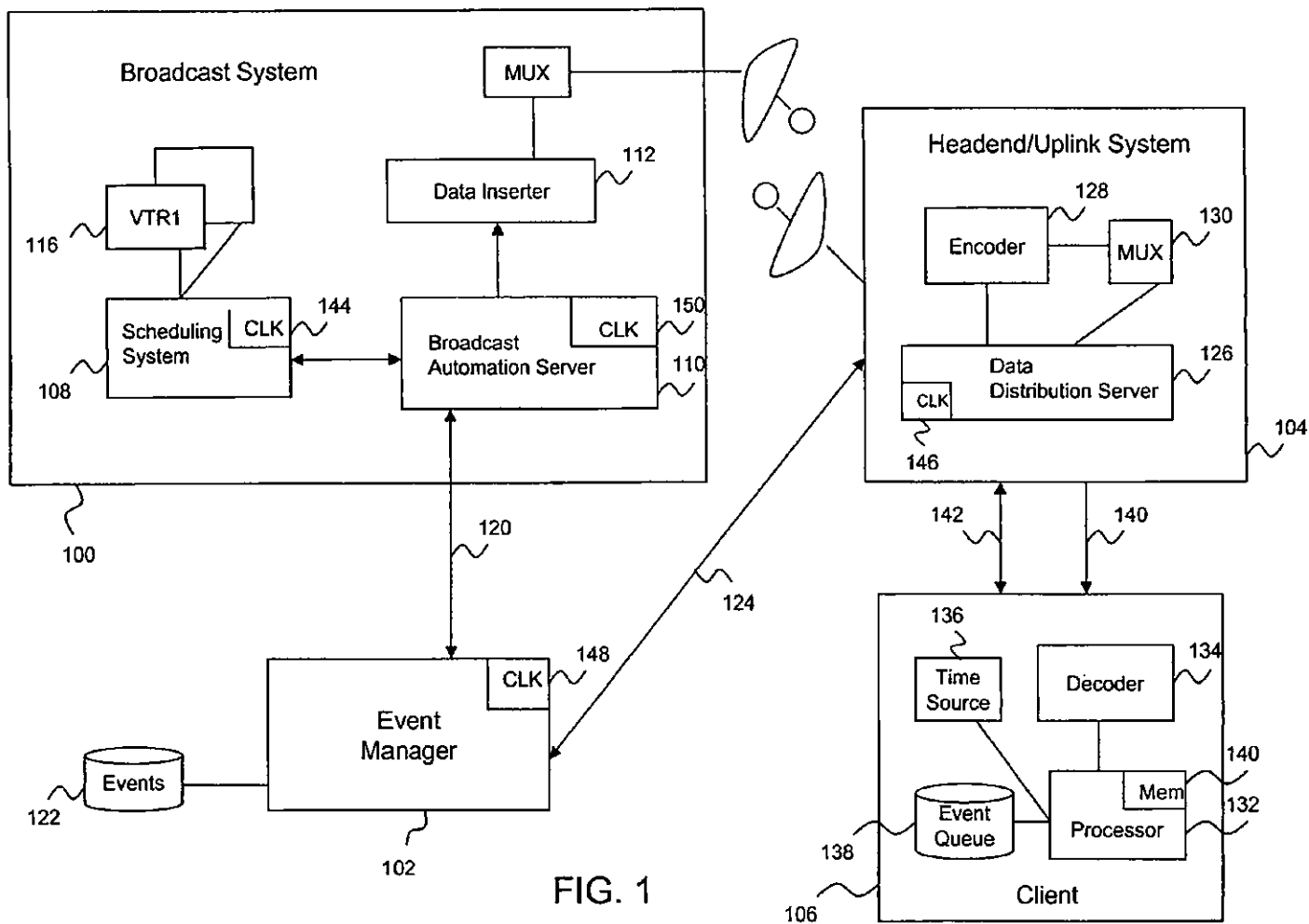


FIG. 1

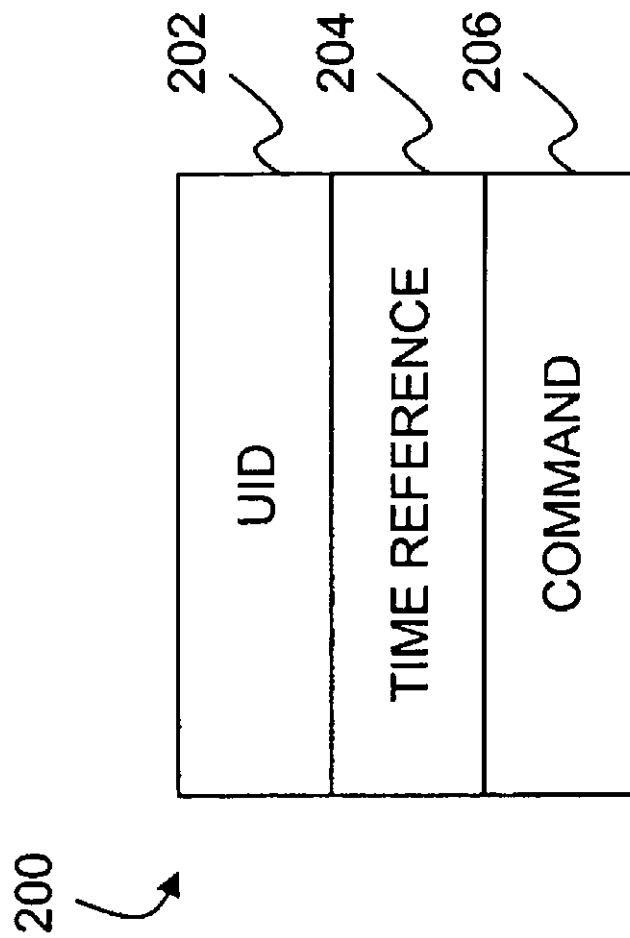


FIG. 2

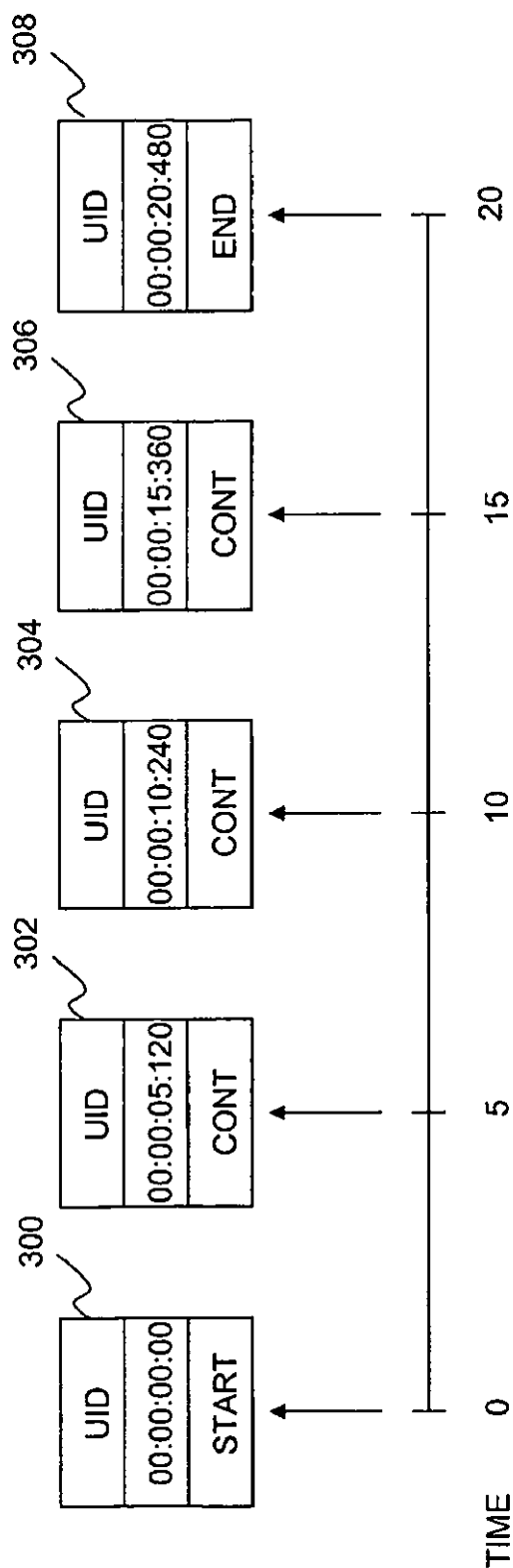


FIG. 3

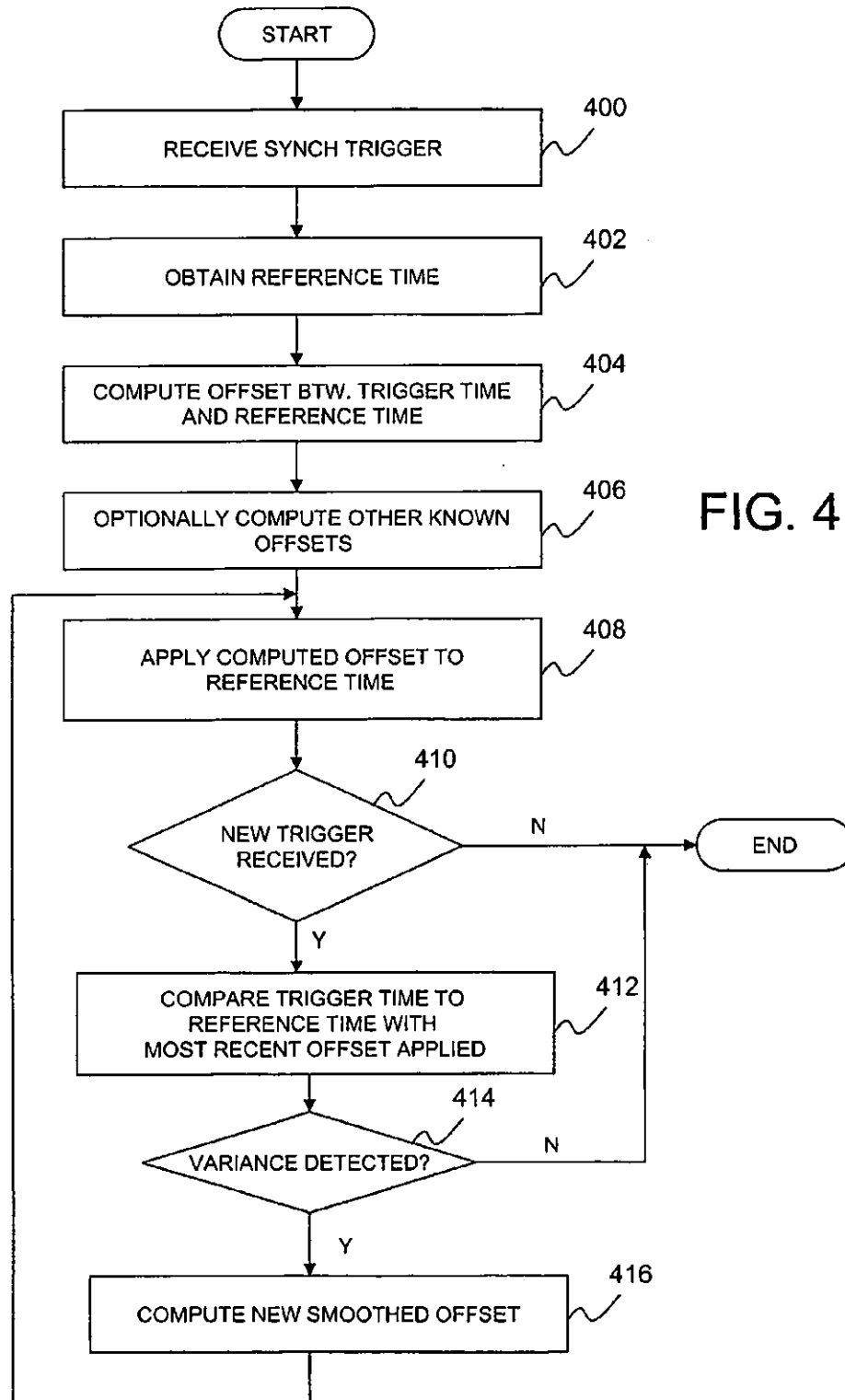


FIG. 4



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## SYNCHRONIZATION AND AUTOMATION IN AN ITV ENVIRONMENT

### CROSS-REFERENCE TO RELATED APPLICATION(S)

This application claims the benefit of U.S. Provisional Application No. 60/542,119, filed on Feb. 4, 2004, the content of which is incorporated herein by reference.

### FIELD OF THE INVENTION

This invention relates generally to interactive television systems, and more particularly, to a system and method for synchronizing interactive television applications with audiovisual television content, such as a broadcast television program, commercial or video-on-demand (VOD) content.

### BACKGROUND OF THE INVENTION

Interactive television (ITV) combines conventional television with additional content, referred to as ITV content, to present a viewer with an enhanced version of audiovisual television content, such as a broadcast television program, commercial or VOD content. As used herein, the term ITV content refers to any additional information or application that is invoked to create one of the aforementioned enhanced television experiences.

An ITV application may be a time-based application that contains ITV events that are tightly linked to an underlying audiovisual content element. Such time-based ITV events may invoke tightly synchronous interactive content such as, for example, play-along game content, karaoke, contextual quizzes, interactive advertisement content, and the like. Under current systems, however, the creating and maintaining tight synchronization of an ITV event with an underlying content element in a consistent and automated fashion remains a challenge. For example, any delay or interruption in the delivery of a television program segment causes the ITV event to be invoked before or after the relevant program segment. Furthermore, losses or alternations to the program data during its transmission process, or latencies in the receiving client during the display of the program, all negatively effect the synchronization of the ITV event to its underlying content element.

Accordingly, what is desired is a system and method which helps maintain synchronization of time-based ITV applications to their underlying audiovisual content elements.

### SUMMARY OF THE INVENTION

The present invention is directed to a method for synchronizing an interactive television (ITV) event with a content element received by a receiving device. The method includes receiving a first trigger including a first time value for a first video frame of the content element. The method also includes obtaining a second time value recorded by an internal time source upon receipt of the first trigger. A first offset between the first time value and the second time value is computed, and the first offset is applied to the second time value. An ITV event is then retrieved based on the second time value with the applied first offset.

The present invention is also directed to a receiver synchronizing an interactive television (ITV) event with a received content element. The receiver includes a decoder, an internal time source, and a processor. The decoder decodes a plurality of triggers where each trigger includes a time value of a

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corresponding video frame of the program. The internal time source records time. The processor executes program instructions which obtain from the decoder a decoded first time value included in a first trigger and obtain from the internal time source a second time value recorded upon receipt of the first trigger. The program instructions further compute a first offset between the first time value and the second time value, and apply the first offset to the second time value. The program instructions then retrieve an ITV event based on the second time value with the applied first offset.

The triggers may be embedded into a video signal associated with the content element, or into a digital transport stream (e.g. an MPEG-2 Multi-Program Transport Stream). The internal time source may be an internal clock or a time-stamp (e.g. a Presentation Time Stamp or PTS) value of a presented video frame.

According to one embodiment of the invention, additional triggers received by the receiver allow the calculation of more accurate offsets. In this regard, the receiver receives a second trigger including a third time value for a second video frame of the content element. The receiver also obtains a fourth time value recorded by the internal time source upon receipt of the second trigger, and computes a second offset between the third time value and the fourth time value. A third offset is derived based on the first offset and the second offset, and applied to the fourth time value. The third offset may be an average of the first and second offsets.

These and other features, aspects and advantages of the present invention will be more fully understood when considered with respect to the following detailed description, appended claims, and accompanying drawings. Of course, the actual scope of the invention is defined by the appended claims.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of an ITV system according to one embodiment of the invention;

FIG. 2 is a block diagram of an exemplary synchronization trigger according to one embodiment of the invention; and

FIG. 3 is an exemplary synchronization trigger embedded into a video program segment according to one embodiment of the invention; and

FIG. 4 is a flow diagram of a synchronization application process according to one embodiment of the invention.

### DETAILED DESCRIPTION

In general terms, the present invention is directed to a synchronization mechanism invoked within an ITV system which helps to maintain tight synchronization between time-based ITV events and an underlying audiovisual content element, such as a segment of a television program, a commercial, a movie, VOD content, or other types of audiovisual content. The synchronization mechanism inserts synchronization triggers into a broadcast audiovisual signal or stream at regular intervals. The triggers may also be delivered over an out-of-band data path. The triggers are preserved throughout the entire transmission of the content element and provide a reliable time and/or frame delineation for the content element. The triggers are used by a reception device to regularly synchronize its time source. Once the time source is synchronized, an ITV application running on the reception device may use the synchronized time to retrieve and run time-based ITV events during the viewing of the content element.

FIG. 1 is a block diagram of an ITV system according to one embodiment of the invention. The ITV system includes a

broadcast system 100, event manager 102, headend system 104, and one or more clients 106. The broadcast system 100, which may be located at a broadcast operating center, includes a scheduling system 108, broadcast automation server 110, data inserter 112, and one or more video players 116 (e.g. VTRs). Other equipment typical in a broadcast operating center may also be included in the broadcast system 100, such as, for example, a character generator (not shown) for overlaying text and images on top of an audiovisual content element.

The scheduling system 108 generates a television programming playlist including a schedule of the programs to be transmitted on a given day. The playlist includes, for example, a list of timecodes along with their program segment identifiers, program segment sources, and/or program segment durations. The playlist is then used by the scheduling system 108 to drive the video players 116 containing the actual video and audio of the content elements that are to be delivered.

The broadcast automation server 110 monitors the generated playlist and detects any changes that may be made to the playlist. According to one embodiment of the invention, the broadcast automation server 110 reads ahead in the generated playlist by, for example, a couple of hours, and transmits up-to-date entries of the playlist to the event manager 102 over a wired or wireless data communications link 120. The data communications link 120 may be for example, a secure Internet link, local area network link, wide area network link, or the like.

The event manager 102 receives playlist information from different broadcast systems and retrieves appropriate ITV event information in response. According to one embodiment of the invention, the ITV event information for the different broadcast systems is centrally maintained in an ITV events database 122. In this regard, the ITV events database 122 stores for each broadcast station, a mapping of ITV events to specific segment (or show) identifiers. The ITV events database 122 further stores for each mapped ITV event, the ITV content presentation information and logic needed by a client for running the ITV event. Such information may include, for example, graphics, text, event times, duration information, and the like.

According to one embodiment of the invention, the ITV event manager 102 detects, among the received playlist information, a program segment that is associated with an ITV event, and prepares to playout data related to the ITV event. The playout data includes, for example, the actual logic and presentation information associated with the ITV event. In addition, the ITV event manager 102 transmits a command to the broadcast automation server 110 to start transmitting, at an appropriate time, synchronization triggers for inserting into the program.

The broadcast automation server 110 generates the synchronization triggers at regular intervals, such as, for example, every 5 seconds, and forwards them to the data inserter 112 for inserting into the content element. Each synchronization trigger includes at least an accurate representation of the time in which the trigger was inserted in the context of the underlying content element as measured by an internal clock 150.

According to one embodiment, the synchronization triggers are embedded into a content element via the data inserter 112. The data inserter 112 is an encoder configured to embed the synchronization triggers in a vertical or horizontal blanking interval of an analog video signal, in a private data field of an MPEG-2 transport stream, in an ancillary data space of a digital video stream, or the like. The triggers are embedded either dynamically or onto a source tape prior to broadcast.

The content element with the embedded synchronization triggers are transmitted to various recipients, including the headend system 104 of a local cable operator or some other uplink system. According to one embodiment of the invention, the headend system 104 includes a data distribution server 126 coupled to an encoder 128 and multiplexer 128, all of which are used to deliver the received content element and any associated ITV data to the client 106.

According to one embodiment, the headend (or uplink) system 104 includes a copy of all or a portion of the playlist generated by the scheduling system 108. The portion of the playlist may be communicated by the event manager 102 over a wired or wireless data communications link 124 such as, for example, a secure Internet link, local area network link, or wide area network link.

Based on its playlist and information provided by the event manager 102, such as, for example, information on the audiovisual content elements for which ITV event information is available, such as a program segment, the data distribution server 126 transmits to the event manager 102 one or more requests for associated ITV event information prior to the scheduled play time of the identified audiovisual content elements. The request is transmitted over the secure data communications link 124.

In response to the request from the data distribution server 126, the event manager 102 transmits to the headend system 104 all event presentation data and logic that the client will need to run an ITV event. The data distribution server 126 delivers to the client the received ITV event data at appropriate times which are calculated based on the scheduled ITV event times.

According to one embodiment of the invention, the ITV event information and logic is encoded into an MPEG-2 transport stream and streamed to the client 106 in-band with the content element. The ITV event information and logic may also be encoded into the vertical or horizontal blanking interval of an analog video signal or into an ancillary data space of a digital video stream. Furthermore, the ITV event information and logic may be delivered out-of-band over an Internet connection, or via a separate channel such as, for example, a return channel.

According to one embodiment of the invention, instead of transmitting the ITV event data to the headend system for delivering to the client, the event manager 102 transmits the data to the broadcast automation server 110 for embedding into the content element. In this scenario, the broadcast automation server 110 invokes the data inserter 112 for inserting the ITV event data into the content element. Thus, the content element received by the headend system 104 already includes the appropriate ITV event information needed by the client.

According to yet another embodiment of the invention, the event manager 102 transmits the command to generate and insert the synchronization triggers to the headend system 104 instead of the broadcast automation server 110. In this scenario, it is the data distribution server 126 at the headend which generates the triggers at regular intervals and embeds them into the content element via the encoder 128. Alternatively, the triggers may be transmitted out-of-band over an Internet link or via an out-of-band forward/return data channel.

Thus, according to the above embodiments, three scenarios are contemplated for transmitting synchronization triggers and ITV event information (collectively referred to as ITV data): (1) the broadcast system 100 embeds both the synchronization triggers and ITV event data into the content element, and the content element is transmitted to the headend system 104 for simply forwarding to the client 106; (2) the broadcast

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system 100 just embeds the synchronization triggers and it is the headend system 104 which transmits the ITV event data to the client 106; or (3) both the synchronization triggers and ITV event data are transmitted to the client by the headend system.

According to one embodiment of the invention, the client 106 is any ITV reception device known in the art, such as, for example, an analog or digital cable, terrestrial, or satellite set-top box. The client 106 includes a processor 132 coupled to a decoder 134 for retrieving and decoding any data embedded into a content element received over a transmission channel 140. The processor may further retrieve ITV data transmitted over an out-of-band data path 142. ITV event information needed for running a particular ITV event is stored in an event queue 138 and recalled upon a determination that it is time to run the stored ITV event.

The time for running an ITV event is determined via a time source 136 which, according to one embodiment of the invention, is kept synchronized to the various clocks 144, 146, 148, 150 used in the ITV system. The time source 136 may be an internal timer or clock, a timestamp value associated with a recently received, decoded, and presented video frame (e.g. the Presentation Time Stamp of an MPEG-2 video frame), or the like.

FIG. 2 is a block diagram of an exemplary synchronization trigger 200 according to one embodiment of the invention. The trigger 200 includes a unique identifier (UID) 202, a time reference 204, and a command 206. The UID is an identifier to the underlying content element content, and may be decoded to retrieve a particular network, content element name, and episode (e.g. Game Show Network—"Greed"—Episode 221). Alternatively, the identifier may be a reference to a particular ITV event.

The time reference 204 provides an accurate representation of the time in the context of the underlying video source. According to one embodiment of the invention, the trigger contains a time reference to the actual frame of video transporting the trigger. The time reference may be an absolute time such as, for example, an SMPTE timecode in the form of hours:minutes:seconds:frames, or a Normalized Play Time (NPT) value in milliseconds, or a time offset from a reference point in the content element such as the start of a program segment, a nearest commercial break or the like.

The command 206 may be any command for decoding by the client processor 132. Exemplary commands include "start," "suspend," "resume," "end," and the like.

FIG. 3 is an exemplary synchronization trigger embedded into a content element according to one embodiment of the invention. A first trigger 300 is embedded for a frame of video which, according to the various clocks 144, 146, 148, 150 used in the system, is identified as frame "0" with time "0." The first trigger accurately represents this time and frame number, and further includes a "start" command. The "start" command may be interpreted by a receiving client as, for example, a command to start the client's time source 136 and the synchronization process. Five seconds into the content element, a second trigger 302 is embedded. The second trigger accurately represents a time of "5" seconds and frame number "120." The second trigger includes a "continue" command to indicate to the client, for example, that the synchronization process is to continue. Third, fourth, and fifth triggers 304, 306, 308 are similarly embedded at 10, 15, and 20 seconds into the program segment; thus, the third, fourth, and fifth triggers respectively indicate a time of "10," "15," and "20" seconds.

When the content element with the embedded triggers are processed and transmitted to the client 106, the time of receipt

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of the triggers may actually differ from the time in which they are expected to arrive. For example, assume that upon receipt of the first frame with the embedded first trigger 300, the client's time source is initialized to time 0. The client's time source thus begins synchronized with the actual content element time as measured by the various clocks 144, 146, 148, 150 utilized in the ITV system. However, assume that due to delays or interruptions in the transmission or processing of the content element, frame 120 of the content element is not received until 7 seconds later instead of the expected 5 seconds which is correctly indicated by the second trigger. The client may thus operate under the presumption that it is presenting a video frame that is 7 seconds into the content element instead of the actual 5 seconds. This may cause the client to mistakenly retrieve an ITV event to be run at 7 seconds into the content element.

In order to address this problem, a synchronization application is run by the client 106 at regular intervals to allow the client to lock itself to the time of the underlying content element as correctly indicated by the received triggers. In this manner, the client operates under the same clock as the clock 150 of the broadcast automation center or clock 146 of the data distribution server embedding the trigger, clock 148 of the event manager 102 providing the time-based ITV event information, and the clock of the scheduling system 144 generating the playlist.

The synchronization application is run by the processor 132 according to computer program instructions stored in its internal memory 140. According to one embodiment of the invention, a phase-locked-loop type approach which accuracy is improved with the receipt of each new synchronization trigger is employed for synchronizing the time source 136.

FIG. 4 is a flow diagram of a synchronization application process according to one embodiment of the invention. In step 400, the application receives a synchronization trigger and in step 402 obtains a reference time that needs to be synchronized. The reference time may be a recorded time value of a running or initialized time source when the trigger is received, or a recorded video presentation value.

In step 404, the application computes an offset between the value of the time reference 204 in the received trigger (the "trigger time") and the reference time. An additional offset value may also be computed in step 406 based on a known fixed latency value. For example, if the trigger is transmitted through an out-of-band data channel, a known latency for transmitting such a trigger may be included into the computed offset value. The computed offset(s) is then applied to the reference time in step 408.

In step 410, a determination is made as to whether another synchronization trigger was received. If the answer is YES, the application compares, in step 412, the trigger time in the newly received trigger to a newly obtained reference time with the most recently computed offset value applied to it. If there is any variance between these two values, the application creates a new smoothed offset as is indicated in steps 414 and 416.

According to one embodiment of the invention, the smoothed offset is generated by applying a weighted average of the new offset value with previous offset values. According to another embodiment of the invention, smoothing and clock adjustment may be performed using a Network Time Protocol (NTP) algorithm.

According to one embodiment of the invention, if the variance detected in step 414 is larger than a predetermined threshold value, the variance is stored in a temporary memory location, and not used to compute a new smoothed offset. If a predetermined consecutive number of variances that exceed

the threshold value are received, an average of the stored variances are used as the new offset, and any prior calculated offsets are discarded.

With the above mechanism, the offsets are calculated to be more accurate with the receipt of each new trigger, allowing tighter synchronization of time-based ITV events with the underlying video. The synchronization mechanism may be employed throughout the duration of an interactive event to prevent a lapse between the time context of the application and the time context of the related video content. According to one embodiment of the invention, if the synchronization application is expecting triggers but fails to receive them, the application may be suspended.

With a synchronized reference time, the client 106 may reliably retrieve appropriate time-based ITV events from the event queue 138. In this regard, the processor 132 computes a timecode based on the synchronized reference time and retrieves an ITV event in the event queue 138 corresponding to the computed timecode. Exemplary time-based ITV events include, but are not limited to, displaying a graphical overlay on top of the video, changing text on the screen, adding or subtracting graphical elements on the screen, generating a sound effect, triggering an animation, transmitting a data element through a return data channel, recording a value into memory, and the like.

A person of skill in the art should recognize that the synchronization approach in the above embodiments may be applied for analog and digital videos. In an analog environment, accurate timing can be achieved through the synchronization triggers and a clock within the synchronization application. In a digital environment, accurate timing can be achieved through the synchronization triggers and either a clock or video timestamp references within the target application.

The synchronization approach is aimed to remain consistent throughout a variety of broadcast and target hardware environments, including low-end set-top boxes with relatively low processing power. Furthermore, the approach is aimed to smooth the fluctuations in delay that can occur during the reception of data in the client 106, such as, for example, due to the execution of higher priority threads, memory management, and other operations performed by the client. The approach accommodates events common to a "real-world" broadcast environment, such as the possible elongation or shrinkage of a commercial break or program segment, interruptions in the feed or video content, and the like.

Although this invention has been described in certain specific embodiments, those skilled in the art will have no difficulty devising variations to the described embodiment which in no way depart from the scope and spirit of the present invention. Furthermore, to those skilled in the various arts, the invention itself herein will suggest solutions to other tasks and adaptations for other applications. It is the applicant's intention to cover by claims all such uses of the invention and those changes and modifications which could be made to the embodiments of the invention herein chosen for the purpose of disclosure without departing from the spirit and scope of the invention. Thus, the present embodiments of the invention should be considered in all respects as illustrative and not restrictive, the scope of the invention to be indicated by the appended claims and their equivalents rather than the foregoing description.

What is claimed is:

1. A method for synchronizing an interactive television (ITV) event with a content element broadcast by a broadcasting device, the method comprising:

generating a plurality of synchronization triggers at predetermined intervals;

inserting the plurality of synchronization triggers into a transport medium at the predetermined intervals, each inserted synchronization trigger including a time indicia representing a time of a frame of the content element transporting the synchronization trigger;

transmitting the synchronization triggers in association with the content element, wherein a receiving device is configured to receive the transport medium with the inserted plurality of synchronization triggers, retrieve the time indicia from each of the plurality of synchronization triggers, and synchronizing the receiving device based on the retrieved time indicia, wherein the synchronizing includes locking the receiving device to the time represented by the retrieved time indicia instead of a time indicated by a local time source; and

wherein the receiving device is configured to synchronize the local time source by:

obtaining a first time value recorded by the local time source upon receipt of a first one of the plurality of synchronization triggers,

computing a first offset between the first time value and a second time value corresponding to the time indicia in the first one of the plurality of synchronization triggers,

applying the first offset to the first time value,

obtaining a third time value recorded by the local time source upon receipt of a second one of the plurality of synchronization triggers,

applying the first offset to the third time value,

determining a fourth time value corresponding to the time indicia in the second one of the plurality of synchronization triggers,

identifying a variance between the fourth time value and the third time value with the first offset applied, and computing a second offset based on the first offset and the identified variance, wherein the second offset is an average of the first offset and the identified variance.

2. The method of claim 1, wherein the receiving device is configured to add a known fixed latency value associated with the transport medium to the first offset.

3. The method of claim 1, wherein the receiving device is further configured to:

compare the variance with a predetermined threshold; ignore the variance in computing the second offset if the variance fails to satisfy the predetermined threshold; and store the variance in a temporary memory location if the variance has been ignored.

4. The method of claim 3, wherein the receiving device is further configured to:

retrieve the variance from the temporary memory location for computing the second offset if a predetermined number of previous other variances fail to satisfy the predetermined threshold.

5. The method of claim 1, wherein the transport medium is a video signal associated with the content element.

6. The method of claim 1, wherein the transport medium is a digital transport stream.

7. The method of claim 1, wherein the transport medium is an out-of-band data path.

8. The method of claim 1, wherein the local time source provides a presentation value of a presented video frame.

9. The method of claim 8, wherein the receiving device is further configured to retrieve an ITV event based on the synchronized local time source.

10. The method of claim 1, wherein the synchronization triggers are generated and inserted every X seconds, wherein X is an integer greater than 0.

11. The method of claim 1 further comprising:  
 generating a playlist including a schedule of programs to be transmitted on a given day;  
 transmitting at least a portion of the playlist to an event manager;  
 retrieving by the event manager ITV event data associated with a particular program identified in the portion of the playlist;  
 transmitting, by the event manager, ITV content presentation and logic information associated with the ITV event; and  
 prompting, by the event manager, the generating of the plurality of synchronization triggers.

12. A system for synchronizing an interactive television (ITV) event with a content element broadcast by a broadcasting device, the system comprising:

a broadcast or headend system generating a plurality of synchronization triggers at predetermined intervals;  
 an encoder coupled to the broadcast or headend system for inserting the plurality of synchronization triggers into a transport medium;  
 a transmitter coupled to the encoder for transmitting the synchronization triggers in association with the content element, wherein a receiving device is configured to receive the transport medium with the inserted plurality of synchronization triggers, retrieve time indicia from each of the plurality of synchronization triggers, the time indicia representing a time of a frame of the content element transporting the synchronization trigger, and synchronizing the receiving device based on the retrieved time indicia, wherein the synchronizing includes locking the receiving device to the time represented by the retrieved time indicia instead of a time indicated by a local time source; and

wherein the receiving device is configured to synchronize the local time source by:

obtaining a first time value recorded by the local time source upon receipt of a first one of the plurality of synchronization triggers,  
 computing a first offset between the first time value and a second time value corresponding to the time indicia in the first one of the plurality of synchronization triggers,  
 applying the first offset to the first time value,  
 obtaining a third time value recorded by the local time source upon receipt of a second one of the plurality of synchronization triggers,  
 applying the first offset to the third time value,  
 determining a fourth time value corresponding to the time indicia in the second one of the plurality of synchronization triggers,

identifying a variance between the fourth time value and the third time value with the first offset applied, and computing a second offset based on the first offset and the identified variance, wherein the second offset is an average of the first offset and the identified variance.

13. The system of claim 12, wherein the receiving device is configured to add a known fixed latency value associated with the transport medium to the first offset.

14. The system of claim 12, wherein the receiving device is further configured to:

compare the variance with a predetermined threshold; ignore the variance in computing the second offset if the variance fails to satisfy the predetermined threshold; and store the variance in a temporary memory location if the variance has been ignored.

15. The system of claim 14, wherein the receiving device is further configured to:

retrieve the variance from the temporary memory location for computing the second offset if a predetermined number of previous other variances fail to satisfy the predetermined threshold.

16. The system of claim 12, wherein the transport medium is a video signal associated with the content element.

17. The system of claim 12, wherein the transport medium is a digital transport stream.

18. The system of claim 12, wherein the transport medium is an out-of-band data path.

19. The system of claim 12, wherein the local time source provides a presentation value of a presented video frame.

20. The system of claim 19, wherein the receiving device is further configured to retrieve an ITV event based on the synchronized local time source.

21. The system of claim 12, wherein the synchronization triggers are generated and inserted every X seconds, wherein X is an integer greater than 0.

22. The system of claim 12 further comprising:  
 a scheduling system generating a playlist including a schedule of programs to be transmitted on a given day;  
 a server coupled to the scheduling system for transmitting at least a portion of the playlist;  
 an event manager receiving the portion of the playlist and retrieving ITV event data associated with a particular program identified in the portion of the playlist, the event manager further transmitting ITV content presentation and logic information associated with the ITV event, and prompting the generating of the plurality of synchronization triggers.

23. The method of claim 12, wherein the synchronization triggers do not contain interactive event data identifying interactive television content presented by the receiving device.

24. The method of claim 12, wherein the locking includes modifying the time indicated by the local time source to the time represented by the retrieved time indicia.

\* \* \* \* \*

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 8,010,986 B2  
APPLICATION NO. : 11/051405  
DATED : August 30, 2011  
INVENTOR(S) : Dakss et al.

Page 1 of 1

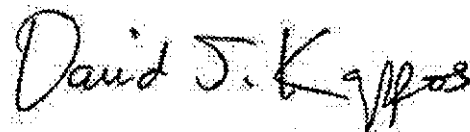
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Column 6, Line 64, delete "that" and insert -- than --, therefor.

In Column 10, Line 48, in Claim 23, delete "method" and insert -- system --, therefor.

In Column 10, Line 51, in Claim 24, delete "method" and insert -- system --, therefor.

Signed and Sealed this  
Seventh Day of February, 2012



David J. Kappos  
*Director of the United States Patent and Trademark Office*

# **EXHIBIT 12**



US006502194B1

(12) **United States Patent**  
**Berman et al.**

(10) **Patent No.:** **US 6,502,194 B1**  
(45) **Date of Patent:** **Dec. 31, 2002**

(54) **SYSTEM FOR PLAYBACK OF NETWORK AUDIO MATERIAL ON DEMAND**

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(73) Assignee: **Synetix Technologies**, San Francisco, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/293,252**

(22) Filed: **Apr. 16, 1999**

(51) Int. Cl.<sup>7</sup> ..... **H04L 12/00; G06F 13/372**

(52) U.S. Cl. .... **713/201; 713/200; 709/231; 370/231; 370/352; 370/310; 370/468; 705/51; 705/26**

(58) Field of Search ..... **705/51, 57, 26, 705/27; 713/200, 201; 370/69.1, 231, 352, 354, 310, 468; 709/231, 233, 235**

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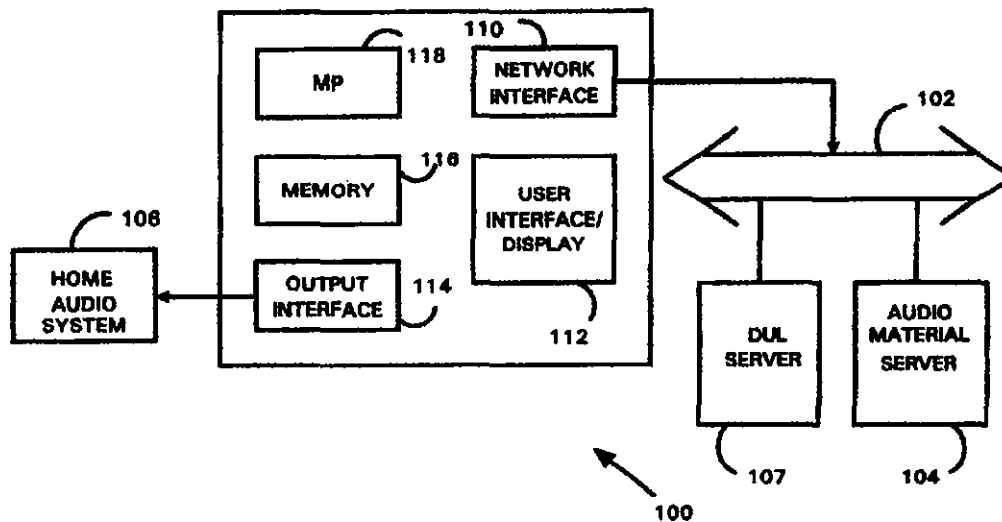
Primary Examiner—Ly V. Hua

(74) Attorney, Agent, or Firm—David A. Hall

(57) **ABSTRACT**

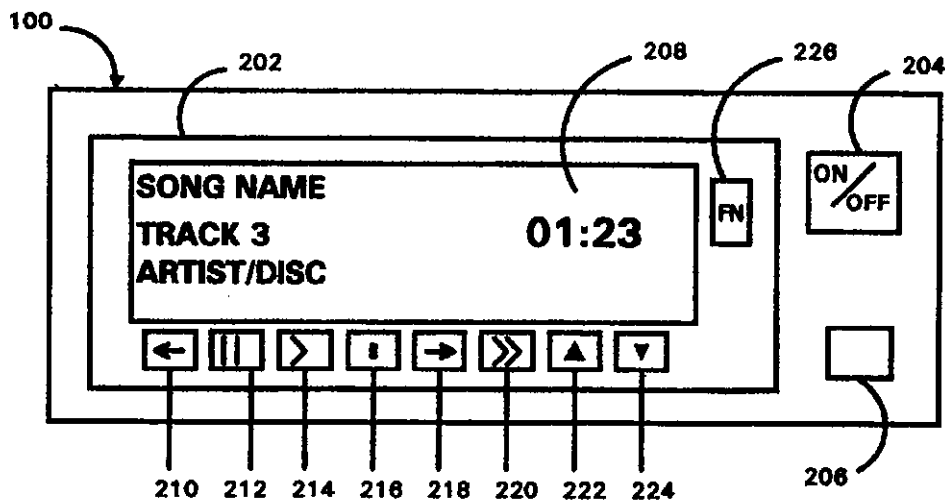
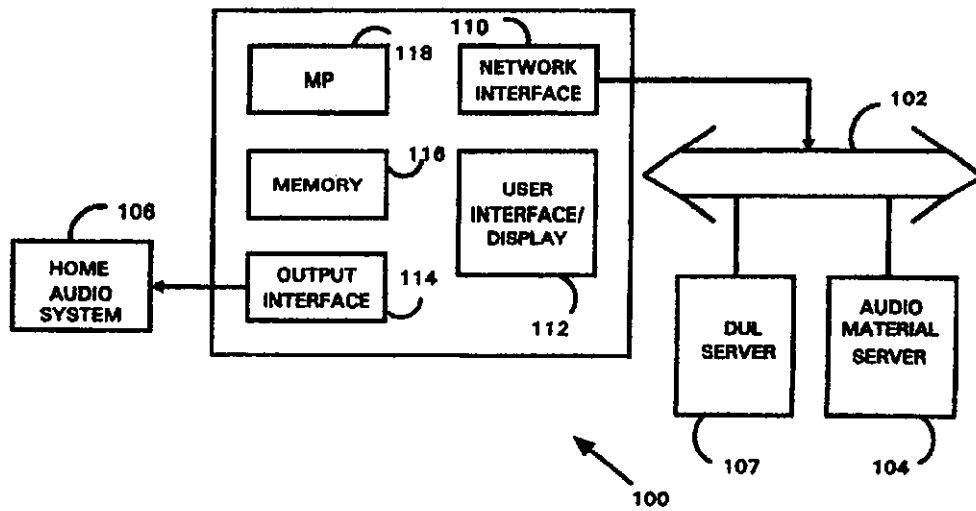
A playback unit resembling a home audio component, retrieves audio data from a remote server and plays them back in real time, using a home audio system, in response to user selection. The playback unit provides an interface between a network source for audio material, such as the Internet, and a conventional home audio system for playback. The playback unit has a relatively simple operating system that does not require a lengthy boot-up sequence, cannot be accessed by the user, and does not require the launch of special software to initiate playback. Access to audio material and distribution rights can be controlled by network servers. In this way, the playback unit can retrieve audio material from the network on demand, thereby vastly expanding the range of music available for playback, and can reproduce that music using the home audio system for high quality playback in a comfortable setting, with controlled access to audio material and controlled distribution and duplication of the material.

**24 Claims, 10 Drawing Sheets**



**EXHIBIT**  
Bove 12  
5/30/14 DHG





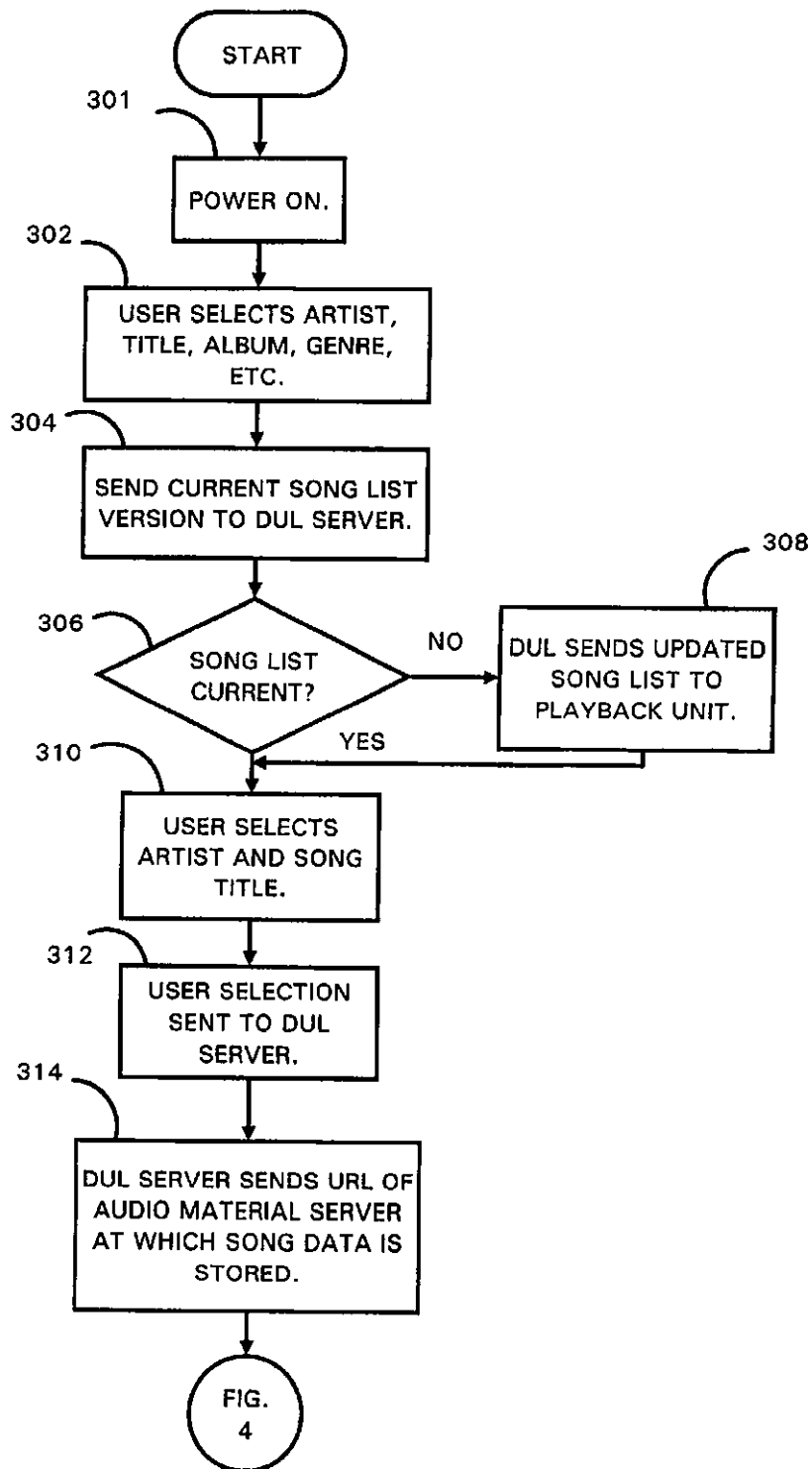


FIG. 3

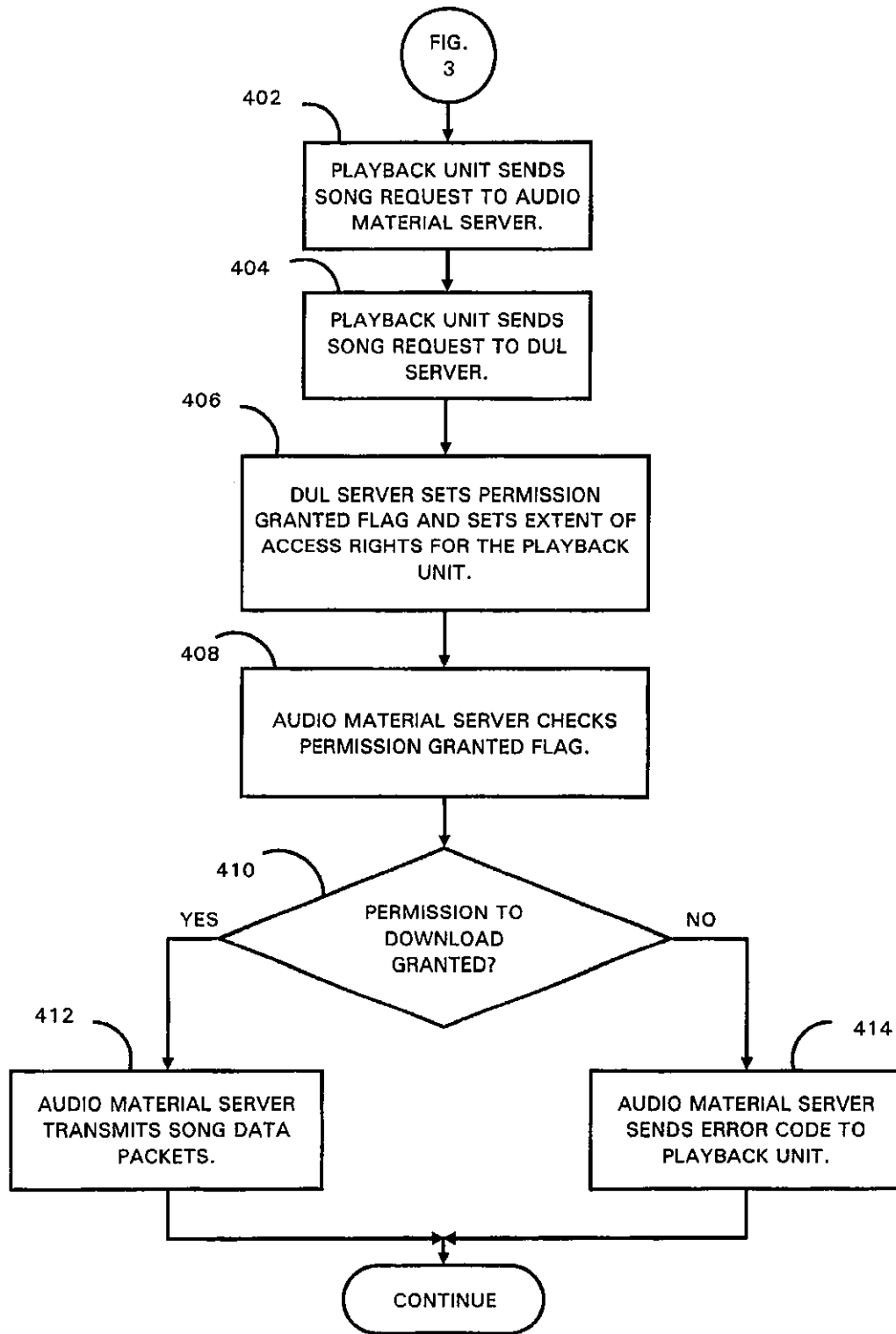


FIG. 4

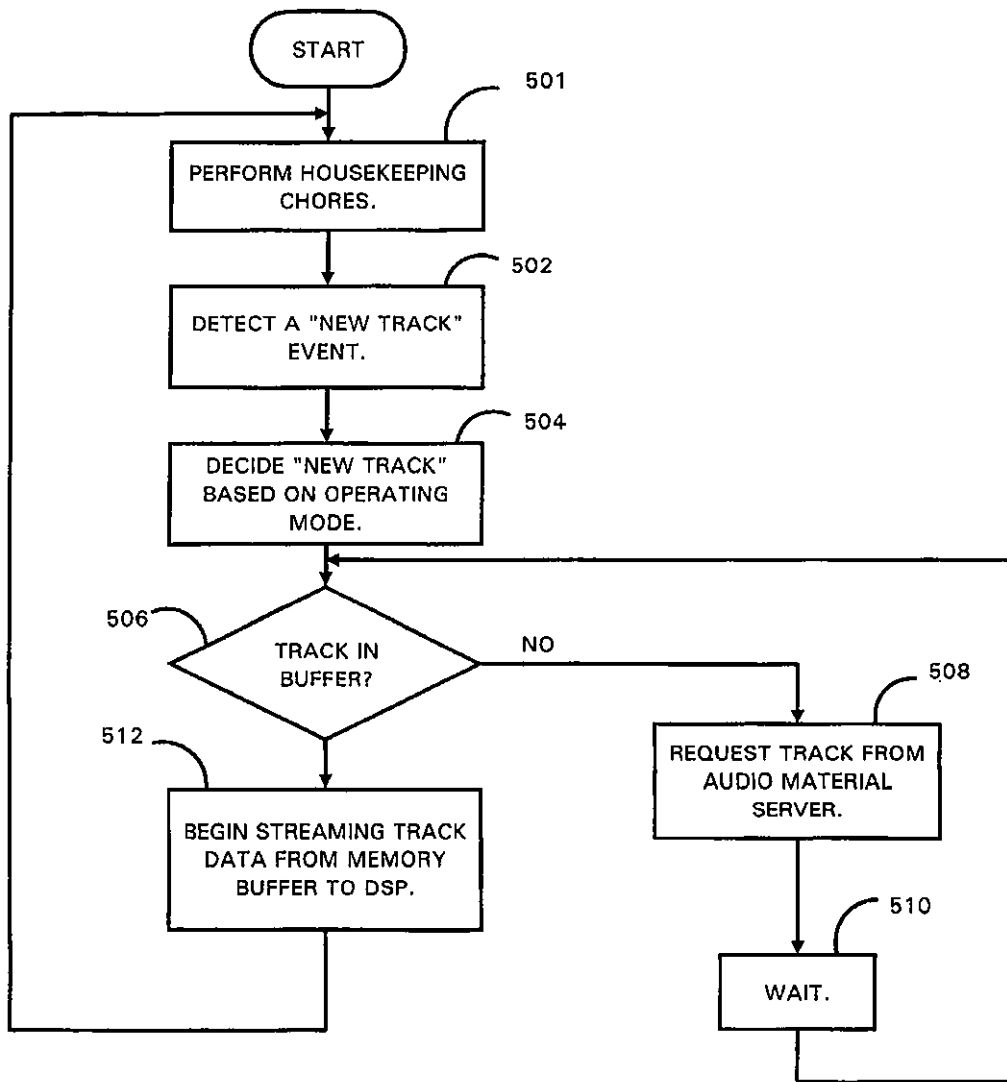
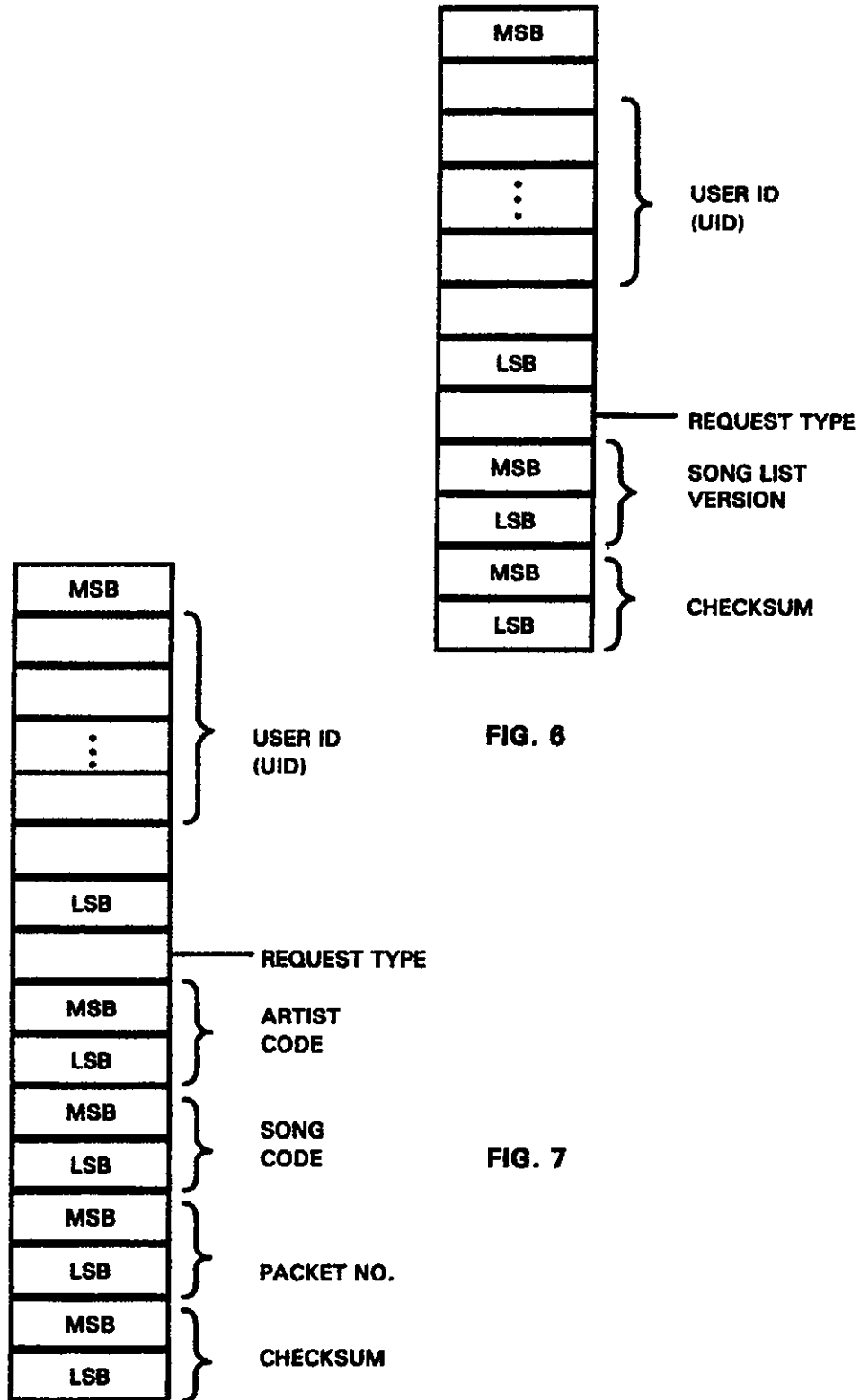
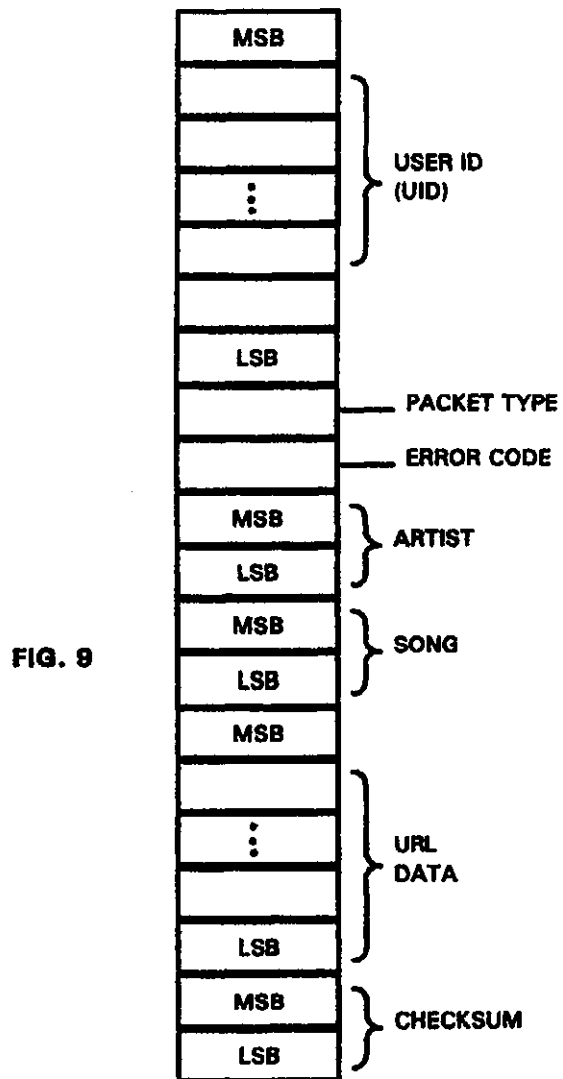
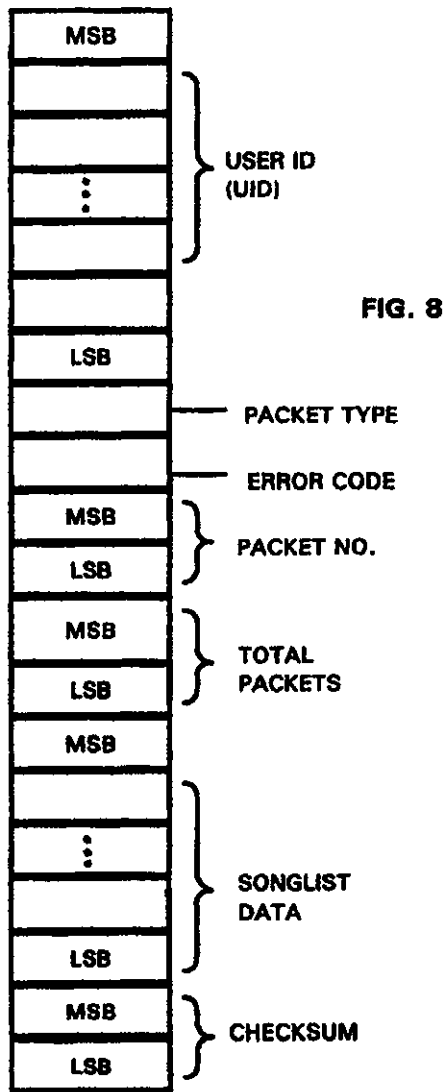


FIG. 5





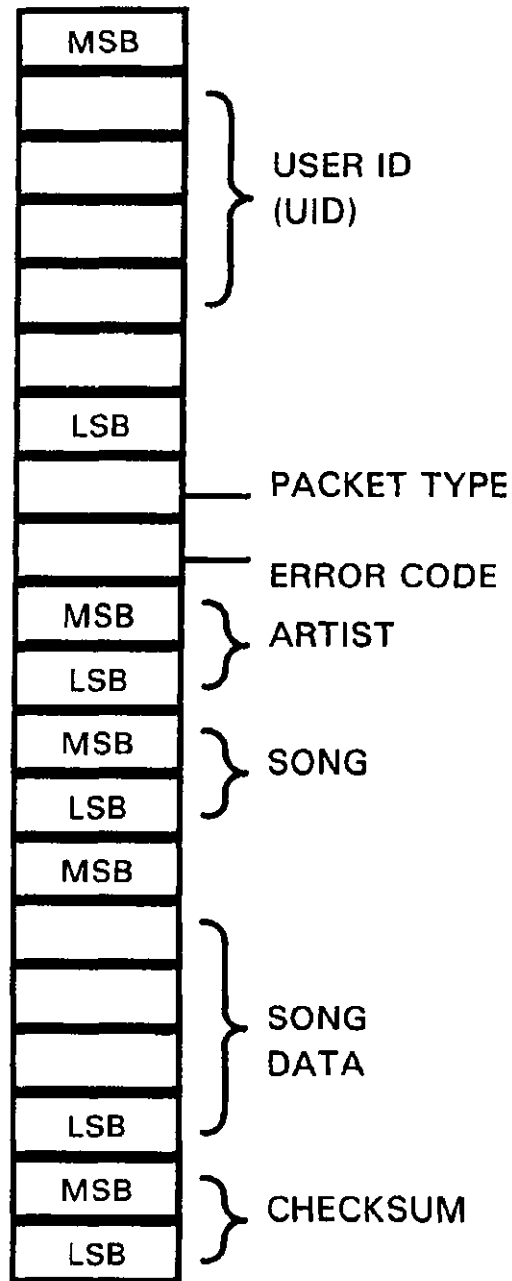


FIG. 10

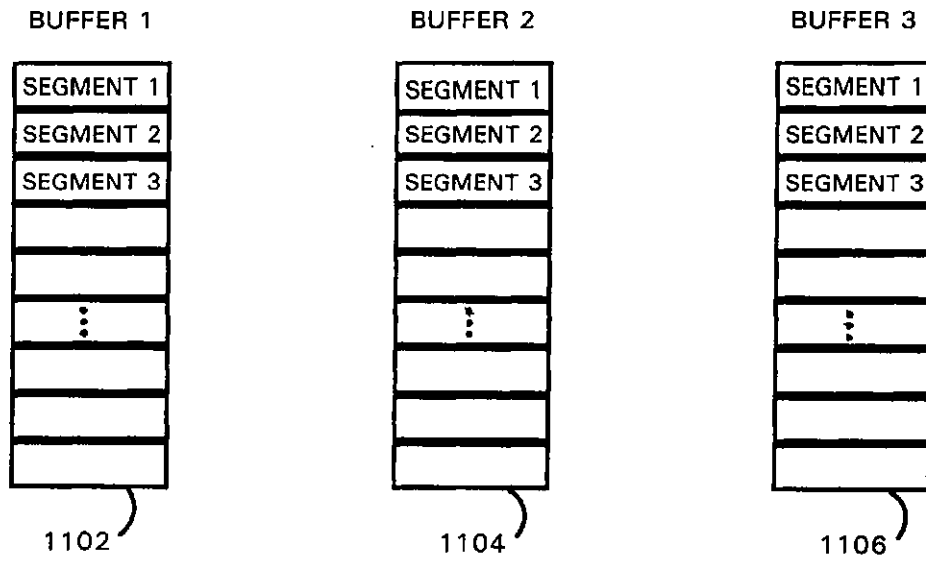


FIG. 11

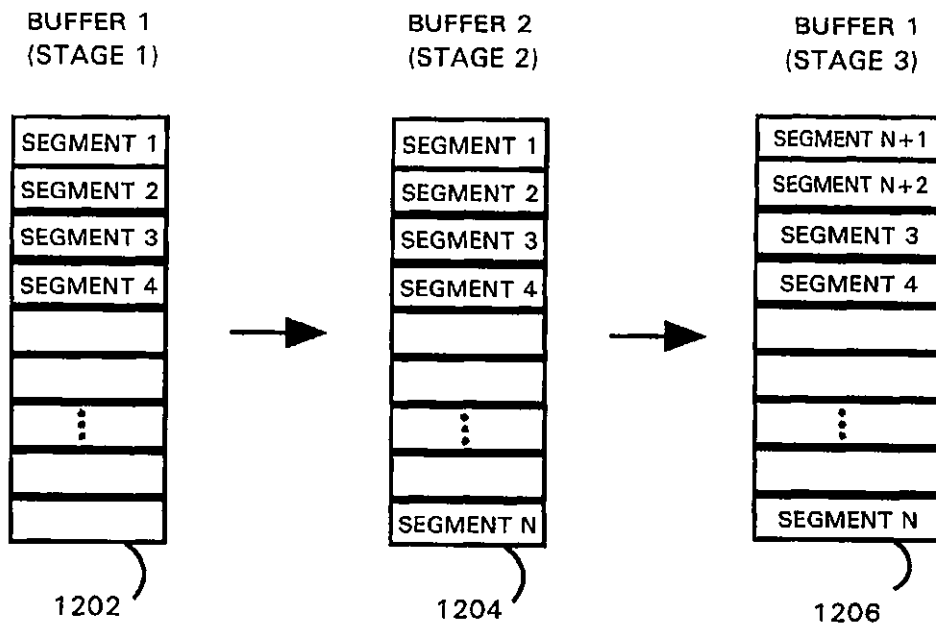


FIG. 12



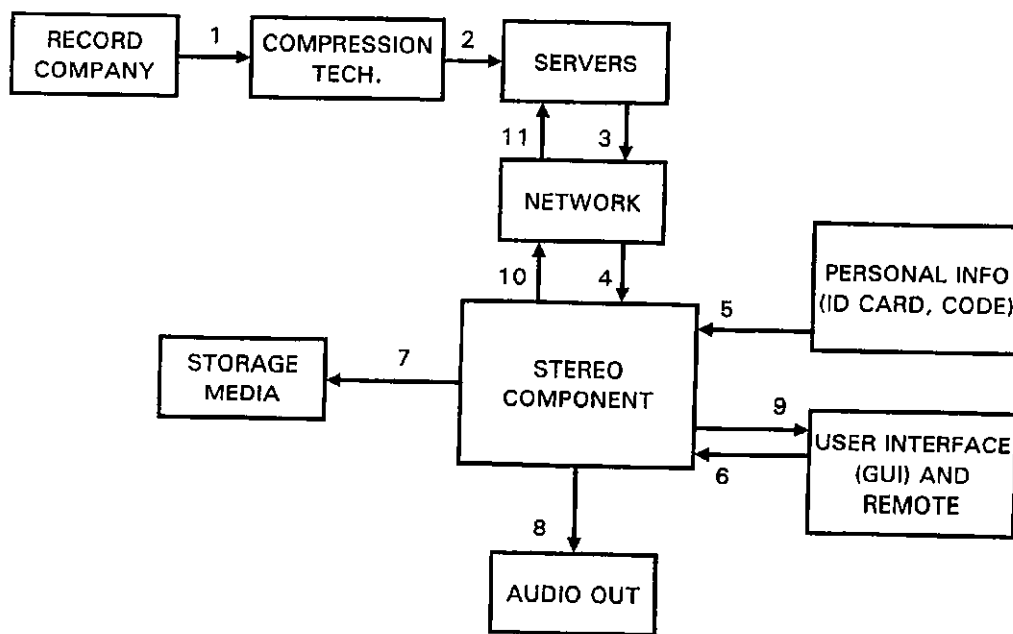


FIG. 13

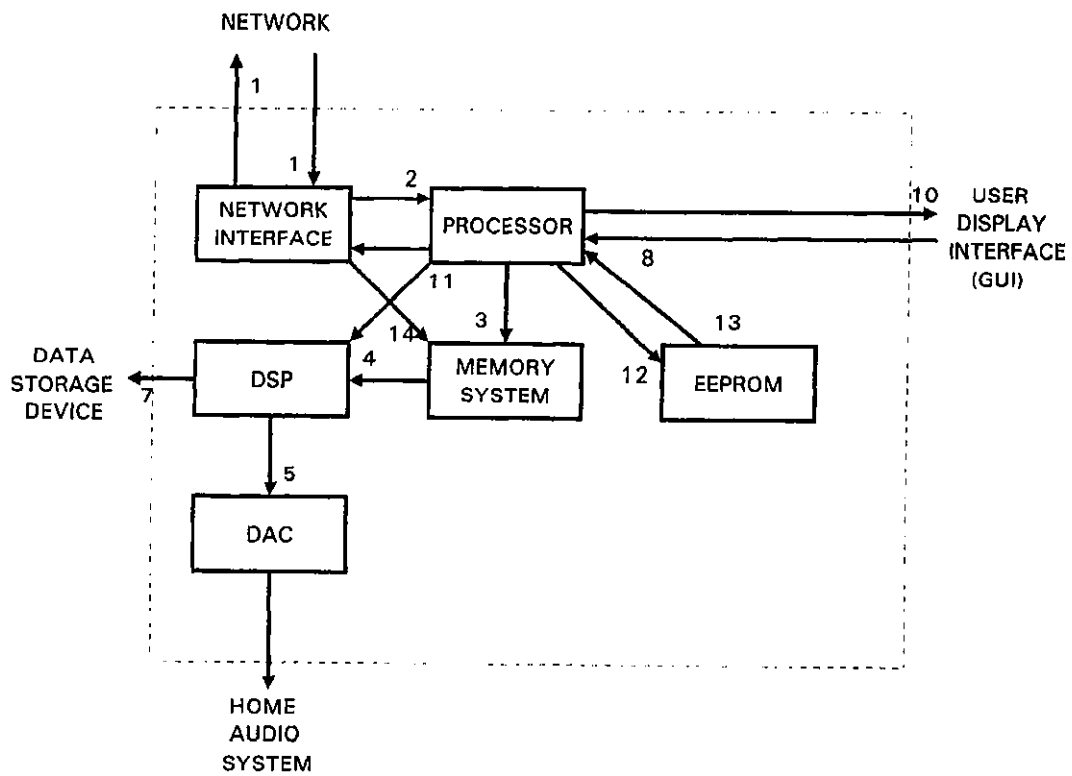


FIG. 14

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## SYSTEM FOR PLAYBACK OF NETWORK AUDIO MATERIAL ON DEMAND

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates generally to music playback systems and, more particularly, to playback of network audio material in response to user command.

#### 2. Description of the Related Art

Two popular means of listening to digitally encoded audio material are conventional home audio music playback systems that include conventional media players that reproduce recorded music information and computer-based systems that typically include a standard personal computer (PC) or similar machine capable of utilizing a variety of digital music formats, including pre-recorded media and computer audio files. Both types of systems permit users to initiate playback of a selected piece of audio material, such as recorded songs or other music.

Conventional home audio music systems typically include a player that accepts media encoded with digital audio material. Such media include the compact disc (CD), MiniDisc (MD), and digital audio tape (DAT) formats. The CD format comprises a plastic-coated aluminum substrate from which digital audio material can be optically retrieved. The MiniDisc is a magneto-optical storage format. The DAT format comprises a tape substrate with a magnetic recording layer in which digital audio material is magnetically recorded. The CD format is the most popular current means of delivering recorded music and offers the largest library of recorded works for selection. Other popular media for playback of digital music information include the "Laserdisc" (LD) format and the "Digital Video Disc" (DVD) format, both of which can combine video information with music or other digital audio information. All of these formats offer a relatively stable recording media, high quality audio reproduction, convenient storage and playback, and simple operation of players.

Home audio players, such as CD players and DAT players, can provide exceptional quality sound reproduction, made all the better because such players are typically connected to a relatively good quality, home high-fidelity music system. The CD format discs are convenient because they are especially easy to store and take up comparatively little storage space. Playback of CDs also is convenient, because the CD player is ready to read the digital audio material upon power-up of (application of electrical power to) the player. For playback the discs are simply inserted into a CD player's tray or slot and started with simple one-button operation. In addition, such home music systems are typically arranged in a comfortable setting within the home. Such home music systems typically include, in addition to the CD player that reads the digital audio material and produces a playback signal, one or more amplification and control devices, signal processors, and power amplifiers to process and amplify the analog playback signal, and also a set of loudspeakers, to receive the amplified playback signal and convert it to sound.

Home music systems permit a user to initiate playback on demand by the selection of an appropriate disc or tape media. The selection, however, must be made from the user's personal collection of media on hand, which limits the available music to that which the user has purchased, borrowed, or otherwise received. This limits the repertory from which the user may select and discourages many users

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from review of and experimentation with audio material and musical products. This is undesirable from the perspective of the music industry, because it is believed that such experimentation and review can lead to further sales of recorded audio material. Borrowing media from another user or from a commercial enterprise, thereby expanding the library of material available to include that which is maintained by acquaintances or rental shops but this is not convenient.

In contrast to the home audio system with CD or DAT player, the conventional computer-based system with appropriate software and hardware can provide music either from pre-recorded digital media or from computer audio files. For purposes of this discussion, the computer-based playback system will be referred to as a PC-based system, regardless of the computer on which it is based.

If the PC-based system includes a CD-ROM drive and sound card, for example, a CD with digital audio material can be inserted into the drive and the sound recorded on the CD can be listened to through PC speakers that receive output from the sound card. This mode of listening has the same limitations of repertoire as the home audio CD player. Moreover, the typical PC-based system does not have audio components as good as that of the typical home audio system, and is usually not located in as comfortable a setting as the typical home audio system.

A PC-based system with access to a network such as the Internet can, with the appropriate software, download audio material for playback. This audio material can comprise, for example, digitized sound clips stored as ".wav" files, MPEG (Motion Picture Experts Group) Audio Layer 3 (MP3) compressed-audio files, streaming audio formats for continuous play of audio material, and other digital formats for the storage of audio material, all of which can be stored on a fixed media and received by the PC. More recently, another sound file format called the Secure Digital Music Initiative (SDMI) has been proposed. Alternatively, the audio material can be received from a network file server, and then stored on the hard drive of the PC itself. Additional software can be used for convenient organization of downloaded music files. Other audio material may comprise streaming audio files, which require additional streaming audio playback software.

Such network downloading of music can vastly expand the repertory from which the user may select, and encourages review of and experimentation with audio material. Again, however, the PC-based system provides limited enjoyment because the typical PC-based system does not have audio components as good as that of the typical home audio system, and is usually not located in as comfortable a setting as the typical home audio system. Furthermore, the PC-based system is not as convenient to use as the home audio system, because the PC is typically located in a work environment away from the home audio system, and the operating system of the PC requires an initial lengthy boot-up process that loads an operating system from peripheral storage, the launching of appropriate player software, and the navigation of a potentially complicated software interface with multiple windows and drop-down menus to select before initiating playback each time the user wants to listen to audio material.

In addition, operating a PC-based system, gaining Internet access, and downloading audio files can require computer skills not possessed by the average listener, in addition to requiring the initial purchase of the computer equipment. Peripheral playback devices also may need to be installed on the PC-based system, requiring knowledge of the operating system and peripheral interface, and some of these formats

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only provide low-fidelity playback that is adequate for audio while working at the computer, but is not useful as an adjunct or replacement for the home audio system and CD player.

Some forms of PC-based systems also are meeting with resistance from commercial music industry interests and from artists because of the potential for widespread copyright violation and the difficulty of policing the download and duplication of audio information files by users. The availability of network databases and the download and duplication of audio files make it almost impossible to monitor and control the distribution of recorded musical performances. Some PC-based systems also may be problematic in view of governmental regulation, such as the Audio Home Recording Act passed by the U.S.A. legislature, which under certain conditions mandates a serial copy management system (SCMS) to control digital copying. It would be advantageous to provide a system that is capable of interfacing with home audio systems for high quality playback, that has access to the large repertory possible through network databases, and would have the acceptance of commercial music interests and artists.

From the discussion above, it should be apparent that there is a need for a system that can provide playback of a wide range of audio material on demand, using the home audio system for high quality playback, without requiring sophisticated computer skills, and with controlled access to audio material and controlled distribution and duplication of the material. The present invention fulfills this need.

#### SUMMARY OF THE INVENTION

The present invention provides a system for playback of network audio material on demand by using a playback apparatus that provides an interface to network audio files that are retrieved in real time in response to user selection. In accordance with the invention, the playback unit provides an interface between a conventional home audio system and a network source for audio material, such as the Internet. The playback unit has a relatively simple built-in operating system that is not accessed from peripheral storage, does not require a lengthy boot-up sequence, and cannot be manipulated without the authorization of the manufacturer or network source. As a result, the playback unit can be operated without special computer skills or navigation of complicated PC-like windows. Receipt of audio material and enforcement of distribution rights can be controlled by network servers that provide the audio material to the playback unit. In this way, the playback unit can retrieve a wide range of digital audio material from the network on demand, thereby vastly expanding the range of music available for playback, can reproduce that music using the home audio system for high quality playback in a comfortable setting, and can provide controlled access to audio material and controlled distribution and duplication of the material.

The playback unit includes a user interface and display component, which presents an easy-to-use interface that simulates playback controls that might be found on a conventional player such as a CD player or DAT player. The user interface and display component substantially duplicates the appearance of a conventional home audio player control panel, such as CD player buttons and track displays. The playback unit also includes memory for holding program instructions and temporarily storing audio material for playback so it is not accessible to the user, and includes a microprocessor that controls operation of the playback unit. In one aspect of the invention, the playback unit includes a

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network interface to communicate with the network, send user commands, and receive audio material. The network interface can communicate using a number of different protocols having a variety of physical connection schemes, such as telephone line modem connections, high-speed Ethernet connections, and cable modem connections. The playback unit also includes an output interface that receives the audio material and provides it to the home audio system in a format that can be reproduced by that system.

Other features and advantages of the present invention should be apparent from the following description of the preferred embodiment, which illustrates, by way of example, the principles of the invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a playback unit constructed in accordance with the present invention showing the connections to a home audio system and a network.

FIG. 2 is a representation of the screen display shown on the user interface of the playback unit illustrated in FIG. 1.

FIG. 3 and FIG. 4 are processing flow diagrams that illustrate the processing steps executed by the components illustrated in FIG. 1 to request, receive, and play audio material from the network.

FIG. 5 is a processing flow diagram that illustrates the processing steps executed by the playback unit processor illustrated in FIG. 1.

FIGS. 6, 7, 8, 9, and 10 are representations of packet information processed by the playback unit illustrated in FIG. 1.

FIG. 11 is a representation of the buffers contained in the memory illustrated in FIG. 1.

FIG. 12 is a representation of the loop buffering operations executed under control of the microprocessor illustrated in FIG. 1.

FIG. 13 is a data flow diagram of the FIG. 1 system operation, showing the information that is transmitted among the system components.

FIG. 14 is a data flow diagram of the playback unit operation, showing the information that is transmitted among the playback unit components.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 illustrates a playback unit 100 constructed in accordance with the present invention. The playback unit communicates over a network, such as the Internet 102, to request digital audio material from one or more audio material servers 104. The playback unit receives audio material from an audio material server and provides it to a conventional home audio system 106 for playback. The playback unit 100 has a simple operating system that accesses instructions from high-speed semiconductor memory, does not require a lengthy boot-up sequence, and cannot be manipulated by the user. Thus, the playback unit does not require the user to launch special software such as the "Windows 98" operating system by Microsoft Corporation to initiate playback, and therefore the playback unit is very stable in operation and can be operated without special computer skills or navigation of complicated PC-like windows. Access to the audio material and authority for distribution rights are preferably controlled by a directory and user list (DUL) server 107 described further below. In this way, the playback unit 100 can retrieve a wide range of digital audio material from the network upon user demand,

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thereby vastly expanding the range of music available for playback, and can reproduce that music using the home audio system for high quality playback in a comfortable setting.

The playback unit 100 is most likely to be installed adjacent to the home audio equipment 106, which typically includes a variety of amplifier, processor, receiver, control, and record/playback units. The playback unit 100 comprises a stand-alone device that is preferably the same size as the individual home audio system devices, so as to be physically and aesthetically compatible with them. The playback unit includes a network interface 110 that provides a communication channel with the Internet 102 and to the audio material server 104. The network interface can communicate using a number of different protocols having a variety of physical connection schemes, such as telephone line modem connections, high-speed ISDN and Ethernet connections, and cable modem connections.

#### Playback Unit Components

The playback unit 100 includes a user interface and display component 112, which presents an easy-to-use interface that substantially duplicates the appearance of 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. In the preferred embodiment, the user interface and display component 112 includes a touch panel or screen that responds to user activation of virtual buttons shown on the display screen. The function represented by the activated display button is then executed by the playback unit. The touch panel permits easy updates to the player functionality by changing the buttons and their operation with new program instructions stored in memory, as described below. Alternatively, the buttons may comprise actual physical buttons that have an electromechanical interface so they respond to physical pressure by producing a signal that activates the corresponding function.

FIG. 2 shows an exemplary display interface comprising a touch panel screen 202 of the playback unit 100. The playback unit preferably includes at least one physical button, a power button 204 that initiates the application of electrical power to the circuits of the playback unit. The playback unit may also include a sensor, such as an infrared sensor 206, for receiving command signals from a remote control unit (not illustrated). The display interface has a display area 208 on which playback status information is shown. For example, FIG. 2 shows the display area 208 with a list of song or selection name, track number, artist name or disc (compilation), and song playing time. The display interface may include virtual operation buttons, or actual physical buttons, that cause operations such as reverse 210, pause 212, play 214, stop 216, forward 218, fast forward/skip 220, cursor navigation up 222 and down 224, and a function select 226 button. As noted above, the buttons 210-226 may be virtual buttons of a touch panel screen 202 also having a status information display area 208, or may be physical buttons adjacent a display area 208 in which alphanumeric information is shown.

Returning to the illustration of FIG. 1, the playback unit 100 also includes an output interface 114, memory 116, and microprocessor 118. The output interface processes the audio material and provides it to the home audio system in a format that can be used by that system. The connection to

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the home audio system 106, for example, can comprise a direct wire connection to home audio loudspeakers that receive an analog signal, or can be a connection to a signal processor, receiver, or other control and/or amplification device for playback using the loudspeakers of the home audio system. The memory 116 holds data including program instructions and temporarily stores audio material for processing and playback. The memory may comprise a combination that includes, for example, semiconductor memory such as electrically erasable programmable read only memory (EEPROM) or flash memory for holding program instructions and buffer memory for holding song data (audio material).

The program instructions are automatically executed by the microprocessor 118 when power is applied to the playback unit. Thus, there is no need to access an operating system stored on a disk drive or other peripheral storage device to operate the playback unit. As a result, the playback unit does not require an electromechanical storage device (such as a disk drive), is very stable in operation, and does not require a boot-up sequence. The buffer memory for audio material storage is preferably dynamic random access memory (RAM), which is a low-cost, efficient means of temporarily storing digital audio material to be processed for playback. In addition, the volatility of the buffer memory ensures that the user has no permanent copy of the audio material, thereby ensuring protection of copyrighted material. As described further below, storage of the audio material in the memory is determined by data downloaded through the network interface 110, and therefore is externally controlled.

The playback unit 100 operates under control of the microprocessor 118, which controls operation of the other playback unit components 110, 112, 114, 116. The microprocessor also performs the various calculations and computations required for processing the audio material and preparing it for playback. If desired, the microprocessor component 118 may work along with a specialized digital signal processing (DSP) circuit for performing sound data computations and, if necessary, audio material data decomposition. As noted above, the program steps executed by the microprocessor are stored in a program instruction flash memory portion of the memory 116. Therefore, although the user cannot change the operating system instructions, the playback unit operation is fully determined by the stored program instructions, which can be changed by loading new instructions into the memory 116. This permits changing, for example, the display buttons to provide new functions.

#### Playback Unit Operating Steps

FIG. 3 is a flow diagram of the processing steps executed by the microprocessor 118 of FIG. 1, and illustrates the processing carried out by the playback unit 100 in response to user commands. An initial step, as represented by the flow diagram box numbered 301, occurs when electrical power is applied to the playback unit. As noted above, the operation of the playback unit is sufficiently simple so that no operating system loaded from peripheral storage is required, therefore, there is no boot sequence, and the user cannot alter system operation of the playback unit. As a result, upon the application of electrical power, the playback unit 100 is immediately operational.

In the first operational step, represented by the flow diagram box numbered 302, the user selects a music category or type of song desired for playback from a list. This list may include categories such as the artist, the song title,

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the album, and musical genres. In addition, the user may limit search results by confining the query to specific, user-defined categories. The generated list appears on the display area of the user interface. In the next step, the playback unit sends the version of the current song list to the directory and user list (DUL) server 107, shown in FIG. 1. During this step, the DUL server also can perform user list checks and authorization confirmation, if desired. In this way, the DUL server acts as a "gatekeeper" to ensure that only appropriate users are being granted access to the audio material, thereby ensuring commercial music interests and artists have desired control over distribution. The flow diagram box numbered 304 represents this operational step.

At the decision box numbered 306, the DUL server checks to determine if the received song list is current. If the song list is not current, a negative outcome at the decision box 306, then a new song list is available and the server sends back an updated song list, as represented by the flow diagram box numbered 308. If the playback unit song list is already current, an affirmative outcome at the decision box 306, then no song list data transmission from the DUL server is needed. With a confirmed current song list, the user is now permitted to select a track from among those available in a selection menu. The selection menus are displayed, for example, on the display area of the interface illustrated in FIG. 2. The user may need to scroll up and down the displayed selection menu list. Tracks can be selected by artist, genre, disc name, or a number of other factors. The operation of a user making an artist and song selection is represented by the flow diagram box numbered 310. At the next step, represented by the flow diagram box numbered 312, the playback unit sends the user-requested song title information to the DUL server. The DUL server returns the network address for the requested song. This step is represented by the flow diagram box numbered 314. The playback unit is now ready to retrieve audio material from the network. The flow diagram for these operations continues in FIG. 4.

In the case of an Internet network connection, the returned network address is referred to as the uniform resource locator (URL) for the song. Once the song URL is received, the playback unit initiates communication with the appropriate audio material server to request the song from the appropriate directory. This step is represented by the FIG. 4 flow diagram box numbered 402. In the preferred embodiment, the DUL server maintains control over communication from the playback unit to the network, and therefore the DUL server can determine if the audio material server at the indicated URL is inactive or not responding. If either is the case, then the DUL server will detect this condition and may send the URL of a backup or alternate audio material server at which the requested song is stored. In this way, the user may still gain access to the requested song and listen to it.

When the playback unit sends the song request to the server whose URL it received from the DUL server, it also sends a user identification code (user ID) and encrypted password information to the DUL server. This step is represented by the flow diagram box numbered 404. That is, because the DUL server maintains communication control, the DUL server can perform a gatekeeping function to permit or prevent the playback unit from receiving the requested audio material. If the user ID and password information is validated, then the DUL server sets a permission granted flag that is checked by the appropriate audio material server. The permission granted flag may be stored at the DUL server and remotely checked by the audio

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material server, or otherwise communicated to the audio material server. This operation step is represented by the flow diagram box numbered 406.

The permission granted flag dictates whether or not a user will be permitted to download a song for listening and also for recording. Other authorizations, in accordance with the Secure Digital Music Initiative (SDMI) for example, may be accommodated. That is, the permission granted flag may grant or deny a range of distribution, reproduction, copy, and recording rights. Thus, the permission granted flag may include a copy authorization flag to control digital copying. These rights may be granted in accordance with predetermined arrangements between commercial music interests and artists on the one hand, and entities controlling the DUL server and audio material servers on the other hand. If permission to record is granted, for example, a feature of the output interface will be set to permit an output format that is suitable for recording. If the user is not granted recording privileges, then no output will be available at the needed output connections of the output interface, or any attempt to exceed the granted song rights will result in display of an error message on the display interface and a halt to operations of the playback unit.

Thus, after the permission granted flag is set by the DUL server at step 406, the audio material server checks the flag at step 408. The flag may be sent to the audio material server by the DUL server or forwarded by the playback unit. If the permission granted flag indicates that the user has been granted permission to download the requested song, an affirmative outcome at the decision box 410, then at the flow diagram box numbered 412 the audio material server transmits the audio material (comprising a sound file or streaming audio information) to the playback unit, where it is received by the network interface as described above. Other operation of the playback unit then continues. If the permission granted flag indicates that the user has not been granted permission to download the song, a negative outcome at the decision box 410, then at the flow diagram box numbered 414 the audio material server sends an error code to the playback unit to halt operation. Similar processing will be performed if other user actions are attempted that require authorization, such as digital copying.

#### Playback Unit Processor Operating Steps

FIG. 5 is a processing flow diagram of the processing steps executed by the playback unit microprocessor 118 shown in FIG. 1, and illustrates the processing repeatedly executed by the microprocessor during operation for responding to user commands. During operation, the microprocessor executes "housekeeping" chores as part of typical background processing as indicated by the flow diagram box numbered 501. The housekeeping chores include, for example, updating the user display, scanning the user keypad buttons for actuation, scanning any infrared receiver for user input, and downloading tasks. The downloading tasks may include, for example, downloading the first few seconds of each track on a current selected disc to reduce the latency time when one of the tracks is later selected by the user. Such samples from the tracks may be stored in the memory of the playback unit for later listening. FIG. 5 illustrates processing when a "New Track" event is detected.

The detection of a user action at the user interface and display is represented by the first FIG. 5 flow diagram box numbered 502, which indicates that the processor detects a "New Track" event. A "New Track" event is defined to be a user action such as selection of the Play button, Skip Track

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button, or other button such as "Jump Track" or "Change Disk" or the like. Upon receipt of a "New Track" event, the microprocessor determines the system operating mode, which may comprise either a normal mode, random mode, or custom mode. This step is represented by the flow diagram box numbered 504.

The system operating modes specify an algorithm for determining the next track. The normal mode specifies that the "next" track is the next sequential track in the selected compilation. The random mode specifies that the "next" track is a randomly selected track in the selected compilation. The custom mode specifies that the "next" track is a user programmed track, such as when a user records a program of track selections for playback in the programmed order.

Once the "next" track is determined in accordance with the operating mode, the microprocessor determines if the next track is in the memory buffer of the playback unit. If the next track is not in the buffer, a negative outcome at the decision box 506, then the microprocessor requests the missing track from the appropriate audio material server. The request is represented by the flow diagram box numbered 508. The microprocessor waits for receipt of the missing track, as indicated by the flow diagram box numbered 510, and then loops to the decision box 506 again. Once a sufficient portion of the track is received or otherwise located in the buffer, an affirmative outcome at the decision box 506, the microprocessor begins streaming the audio material data from the memory buffer to the DSP for processing. The DSP may be one of a number of commercially available DSP engines for the decompression and decoding processing of digital audio data. Those skilled in the art will understand the processing involved without further explanation.

#### Data Packets

As noted above, the network interface can communicate using a number of different protocols having a variety of physical connection schemes. FIGS. 6, 7, 8, 9, and 10 show the data bytes of exemplary data packets that can be used to communicate the different types of information needed for operation of the system constructed in accordance with the present invention. FIG. 6 illustrates the data packet when the playback unit requests a song list version check. FIG. 7 illustrates the data packet used when the playback unit requests a song from the audio material server. FIG. 8 illustrates the data packet used when the DUL server sends an updated song list to the playback unit. FIG. 9 illustrates the data packet when the DUL server sends the URL of a song to the playback unit. FIG. 10 illustrates the data packet when an audio material server sends a song to the playback unit. It should be understood that the data packets of FIGS. 6 through 10 are intended only to illustrate the type of information that may be exchanged between the playback unit, DUL server, and audio material server, and should not be taken in a limiting sense as a requirement for operation of a system constructed in accordance with the present invention.

FIG. 6 shows the user request data packet. With this packet, the playback unit requests a check to ensure the song list being used is current. The first eight bytes comprise an optional user ID field that would be sent so the DUL server can identify who is requesting the song list. The next byte is a request field that permits the DUL server (or any other network server) to identify what data is being requested by the client playback unit. The next two bytes comprise a song

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list version field that provides the version number of the song list currently stored in the memory of the playback unit. Finally, the last two bytes of the data packet contain checksum data for identifying any errors that might occur during transmission over the network connection.

FIG. 7 shows the song request data packet. The first eight bytes contain the optional user ID data and the next byte contains the request data, as described above for FIG. 6. The next two bytes contain an artist code comprising a unique identification number for an artist of a song. The artist code (AC) can be used as an index to the directory on the audio material server that contains the artist's work. The next two bytes contain the song code (SC) comprising a unique identification code for the requested song. The song code can be used as an index to the song data file on the audio material server. The next two bytes contain a packet identification code (packet ID) that tells the audio material server which packet to send next. That is, because each song to be downloaded is sent in several pieces, the playback unit must be able to communicate to the audio material server which portion of the song is needed next. The last two bytes comprise the checksum field for identifying errors.

FIG. 8 shows the updated song list packet, which is sent from the DUL server to the playback unit. The first eight bytes contain the user ID, which in this case is returned to the playback unit for purposes of error checking, to confirm that the updated song list information was sent to and received by the correct playback unit. The next byte contains packet type data, which is necessary to let the playback unit know how to interpret the data it receives. That is, the packet type data for this transmission lets the playback unit know that an updated song list is being sent. The most significant bit (MSB) position indicates whether or not this is the last packet of data that will be sent with this type of information. An error code (EC) byte is next, which provides the error code that (if necessary) is displayed on the display component. A two-byte packet ID field is next, and is used to let the playback unit know which area of the memory in which the data needs to be stored. That is, the song list data is organized according to a predetermined arrangement and the playback unit needs to conform its memory to that predetermined arrangement. Next is a two-byte field that provide the total number of packets to transmit the song list update information. This is needed so the playback unit can adjust the buffering scheme. The next field has a variable number of bytes, as it contains the songlist data. This number may vary depending on the network connection and the transmission protocol being used, among other considerations that will occur to those skilled in the art. Finally, the last two bytes of the updated song list packet comprise checksum data for identifying errors.

FIG. 9 shows the packet containing the URL of a requested song. The first eight bytes contain the user ID, which as before is returned to the playback unit for purposes of error checking, to confirm that the requested information was sent to and received by the correct playback unit. The next byte contains packet type data, which is necessary to let the playback unit know how to interpret the data it receives. In this case, the packet type data will indicate that a URL is being sent, and the MSb position will indicate whether or not this is the last packet of data that will be sent with this URL information. An EC byte is next, to provide any error code to be displayed on the display component. The next two bytes are an artist code (AC) that is sent to the playback unit to ensure that it can place the URL data in the correct memory buffer. A song code (SC) occupies the next two bytes, the code being used to ensure that the playback unit

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places the URL data in the correct memory buffer. The next four bytes contain URL data that identifies the audio material server that contains the desired song for playback. The last two bytes of the URL packet contain the checksum data for identifying errors that occur during transmission.

FIG. 10 shows the song data sent by an audio material server to the playback unit. The user ID is contained in the first eight bytes, returned as a form of error checking and to confirm that the requested song information was sent to and received by the correct playback unit. The packet type data is contained in the next byte, and in this case the MSB indicates whether or not this is the last packet that will be sent. The EC is contained in the next byte. The AC occupies the next two bytes, to ensure that the playback unit places the song information in the correct memory buffer. The SC occupies the following two bytes, again sent to ensure that the playback unit places the song information in the correct buffer. The next field contains the actual song data and has a variable number of bytes. The number of bytes of song data may vary depending on the network connection and the transmission protocol being used, among other considerations that will occur to those skilled in the art. The song data will be placed in a section of memory that depends on the artist, song, and packet number. Finally, the last two bytes of the song data packet comprise checksum data for identifying errors.

#### Memory Buffering Control

FIG. 11 is a representation of the buffering operations of the playback unit. The playback unit memory may be segregated into a number of sequential buffers, with each buffer preferably containing one song. Based on typical compression algorithms, the size of each buffer will be approximately two megabytes (2 MB). The number of buffers that can be accommodated by the playback unit is determined by the amount of memory (bytes) that the playback unit microprocessor can access, so the number of buffers available will be variable. Nevertheless, the functionality of the playback unit remains the same regardless of the available memory address space. The addressable portions that make up each buffer will contain data that, when processed, produces approximately ten seconds of audio listening.

The buffering of song data ensures that a song may be downloaded and temporarily stored in less time than needed to play the song. The speed of this buffering operation will depend on the speed of the network connection available. Buffering begins after the user selects one or more songs for listening. The playback unit downloads the selected songs in data packets, which in the preferred embodiment each contain approximately ten seconds of compressed digital audio information. As noted above, the number of data packets to be downloaded for each song is an undetermined number that depends on the song length. It is not necessary for song data download to be completed for one song before download for another song can begin. Preferably, portions of each selected song will be downloaded as the first one begins to play. This is illustrated in FIG. 11, which illustrates the multiple buffers 1102, 1104, 1106 into which the memory of the playback unit is segregated. The current song's buffer has priority over all other buffers; the data flow into this buffer is maintained such that continuous playback of the song is guaranteed. The buffers corresponding to the following musical selections are periodically updated with their songs' data.

For example, if a user wants to hear Song1, Song2, and Song3, the playback unit downloads a number of packets for

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Song1 into the first available buffer 1102. Once a sizeable amount of compressed audio information is stored for that song, the playback unit begins to process the information and play the song, providing the processed information to the home audio system. The audio information will be processed by the microprocessor and sound data DSP, if one is included in the playback unit. The amount of stored information needed before playback begins will depend on the microprocessor, DSP, and other sound components of the playback unit. As the first song (Song 1) is being played, the playback unit continues to operate and, in background operation, continues to download the Song 1 data into the first buffer 1102, and also downloads data for the other selected songs into the other buffers 1104, 1106 in an alternating fashion. Each song will be placed into a different sequential buffer. This ensures that some portion of each selected song will be downloaded and available as soon as possible, thereby permitting the user to skip to one of the other selected songs after playback has begun.

The playback unit preferably performs a loop buffering operation, which is illustrated in FIG. 12. The loop buffering operation progresses from left to right in FIG. 12. Loop buffering is used to limit the size needed for each buffer. In particular, a buffer is not expected to have sufficient capacity to contain the entire data needed for one song. Rather, data in a given buffer is overwritten as it is processed and played. Thus, after the last segment of memory in a buffer for a song has been filled with a song data packet and that buffer is processed for listening, the next song data packet will be written to the first segment in that buffer. As described above, this writing will be directed by setting the various fields in the song data packet illustrated in FIG. 9.

Three exemplary stages of loop buffering are illustrated in FIG. 12 from left to right, showing the contents of a buffer at a first stage 1202 of buffering, at a second stage 1204 of buffering, and at a third stage of buffering 1206. As the song is downloaded at the first stage 1202, the buffer is filled with data bytes for Segment 1, Segment 2, Segment 3, and so forth. Eventually, the last available segment in the buffer is filled 1204 with Segment N, before the song has been completely downloaded. Therefore, the next segments of incoming data, Segment N+1, Segment N+2, Segment N+3, and so forth, will overwrite the prior data in the buffer 1206. Buffering will continue looping in this fashion, overwriting repeatedly until the song is completely downloaded.

Loop buffering ensures that the user can scan a song in a backward direction, such as might be done for review to hear missed lyrics or other reason. If a user decides not to listen to the current song and skips it entirely on playback, it remains in the playback unit memory so the user can return to the skipped song and listen to it. In all cases, loop buffering and overwriting of buffer data will not begin until the first segment of the buffer has been processed for listening. That is, listening to a song cannot begin until the buffer for that song is initially filled, and overwriting will not begin until listening to that song has begun. However, if the user adds more songs to the playback unit than can be downloaded into the available memory, then a newer song on the playback list will begin overwriting the oldest song in memory after the last segment of the last available buffer is filled with song data.

#### System Data Flow Diagram

FIG. 13 is a data flow diagram of the system of FIG. 1, showing the information that is transmitted among the system components and how those components interact. In



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a preliminary stage of information flow, music is submitted for digital conversion, data compression, and encoding by commercial music interests, such as a record company or an entertainment music company, or by an artist. This flow from the submitted music to the compression technology is indicated by the FIG. 13 data flow arrow marked "1". After the compression and encoding, the digital information in the form of music files is uploaded to servers, such as the audio material servers described above. The servers maintain file organization, for example, according to musical genre, artist, album or compilation name, and song title. In addition, the servers may store information pertaining to users, such as usual or preferred selection patterns, so that a predictive loading scheme can be used to direct downloads in of music files. For example, the first ten seconds of a user's one-hundred most frequent selections may be downloaded immediately upon receipt of that user's identification number, to minimize any delay associated with the typical query and response processing. The data flow from the compression technology to the servers is indicated by the FIG. 13 data flow arrow marked "2".

After a user requests a song, the system responds by sending a data stream from a server through any established data transfer line to the music information network. In the preferred embodiment, this network is the Internet. Connecting the users and the servers through the Internet provides a convenient and easily accessible means of transferring the music information from the servers to the users. The data stream includes a copy flag code indicating whether the requested audio material is for immediate listening only or if digital copying and recording rights are also requested. The data flow from the servers to the music information network is indicated by the FIG. 13 data flow arrow marked "3". At the playback unit, indicated as the "Home Audio Component" in FIG. 13, network interface is used to receive the data stream, as indicated by the data flow arrow marked "4". The data transfer methods may include, for example, use of analog telephone line communication, ISDN services, high-speed cable communications for video and digital data, and the like.

Next, the user identification information provides identification of the listener for billing purposes and for personalization features, such as described above. The user identification information can be entered, if desired, using a card with magnetically encoded user information, so such as a credit card, or the information can be entered manually through the user display interface. A default ID may also be associated with the unit itself. The data flow of personal information from the user to the playback unit is indicated by the FIG. 13 data flow arrow marked "5".

As described above, searching of available audio material may be carried out by a user through the user display interface. The data flow from the user display interface to the playback unit is indicated by the FIG. 13 data flow arrow marked "6" and contains commands issued from the user display interface to the main unit. In the preferred embodiment, 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. 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. This GUI may be replicated on a remote control device, as indicated in FIG. 13.

After the user has used the GUI to select music, one of the options that can be permitted by the system is to send the digital output of audio material to a storage device for digital

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recording on storage media, as indicated by the FIG. 13 data flow arrow marked "7". Alternatively, an analog audio signal is sent from the playback unit to audio connections of the home audio system, as indicated by the FIG. 13 data flow arrow marked "8". While music is being delivered to the designated destinations, the user display interface shows information concerning the current and upcoming user selections. The data flow from the playback unit to the user display interface is indicated by the FIG. 13 data flow arrow marked "9".

During the time a user is cleared via the personal information for accessing the servers, the user may upload additional information and queries using the network communications, as indicated by the FIG. 13 data flow arrow marked "10". Using the appropriate network protocols, the correct server is contacted. For example, different servers may have different types of musical genres, or the servers may each store many different types of music. The data flow from the network to the servers is indicated by the FIG. 13 data flow arrow marked "11".

FIG. 14 is a data flow diagram of the playback unit illustrated in FIG. 1, showing the information that is transmitted among the playback unit components and how those components interact. As noted above in the discussion of FIG. 13, a network data stream is received at the playback unit. The FIG. 14 data flow arrow marked "1" indicates that the data stream is received at a network interface for the conversion of received data into a data stream that can be used by the playback unit. As noted above, the data may be received through an analog telephone line communication, ISDN services, high-speed cable communications for video and digital data, or similar scheme. Thus, two-way network communication is contemplated for the receipt of this information over the network. Next, the received identification data is provided to the processor of the playback unit. The data flow from the network interface to the processor is indicated by the FIG. 14 data flow arrow marked "2". Initially, the processor sends the received audio material to the memory, as indicated by the FIG. 14 data flow arrow marked "3". The processor then determines how to process and handle the audio material.

In the preferred embodiment, the playback unit includes a digital signal processor (DSP) that is specially designed to perform audio decompression. The processor determines when the received audio material in the form of compressed digital files are sent to the DSP and when the audio material is simply erased or overwritten. This action is represented by the FIG. 14 data flow arrow marked "4". At the DSP, the processed audio material is sent to the digital-to-analog converter (DAC) subsystem for output to the home audio system for listening. The data flow from the DSP to the DAC is indicated by the FIG. 14 data flow arrow marked "5". The data flow from the DAC to the home audio system is indicated by the FIG. 14 data flow arrow marked "6". If digital copying of the audio material has been authorized (such as described above in connection with the data flow arrow of FIG. 13 numbered "7"), then the DSP sends digital output to a digital media storage device. The data flow from the DSP to the storage device is indicated by the FIG. 14 data flow arrow marked "7".

In FIG. 13, it was noted that a user may upload additional information and queries during the time a user is cleared via the personal information for accessing the servers. It should be understood that such communications must first proceed from the user through the playback unit processor and through the network interface to the servers. In FIG. 14, the data flow of instruction and information from the user, via

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the user display interface, is indicated by the data flow arrow marked "8". The data flow of user information and queries from the processor to the network interface is indicated by the data flow arrow marked "9". The processor may convey return information back to the user through the user display interface, as indicated by the FIG. 14 data flow arrow marked "10".

The information received by the processor includes a copy authorization flag that permits or prohibits digital copying. This permits, if needed, compliance with regulatory schemes such as the U.S.A. Serial Copy Management System (SCMS), or the SDMI format, or forms of digital signature or digital watermark authorizations. Thus, depending on the received information, the processor determines whether the DSP output will be sent to the DAC for output to the home audio system or to a storage device for digital recording. The data flow of processor command to the DSP for output control is indicated by the FIG. 14 data flow arrow marked "11".

The playback unit preferably includes an EEPROM that permits convenient updates of functionality and features. Thus, new programming code and data can be stored into the EEPROM under control of the processor. The data flow of processor command from the processor to the EEPROM is indicated by the data flow arrow marked "12". The data flow of programming instructions and data from the EEPROM to the processor is indicated by the data flow arrow marked "13".

Finally, the audio material, stored in compressed format, may include partial downloads of music files, as commanded by the received data packets (described above). These partial downloads may have been selected, for example, by the predictive downloading schemes that respond to user information (see the data flow arrow of FIG. 13 marked "2"). The partial downloads are received at the playback unit and stored in the memory. The data flow of audio to material from the network interface to the memory is indicated by the FIG. 14 data flow arrow marked "14".

Thus, the music playback system described above provides an interface between a conventional home audio system and a network source for audio material comprising a playback unit with a simple operating system that is not accessed by the user and does not require the launch of special software to initiate playback. Therefore, the playback unit can be operated without special computer skills and without navigating complicated PC-like display windows. Access to audio material and distribution rights are controlled by the DUL servers and audio material servers, thereby enabling the playback unit to retrieve a wide range of digital audio material from the network on demand and vastly expanding the range of music available for playback. In this way, the system permits the reproduction of music using the home audio system, for high quality playback in a comfortable setting, and provides controlled access to audio material and controlled distribution and duplication of the material.

The present invention has been described above in terms of a presently preferred embodiment so that an understanding of the present invention can be conveyed. There are, however, many configurations for network-based music playback systems not specifically described herein but with which the present invention is applicable. The present invention should therefore not be seen as limited to the particular embodiments described herein, but rather, it should be understood that the present invention has wide applicability with respect to network-based music playback systems

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generally. All modifications, variations, or equivalent arrangements and implementations that are within the scope of the attached claims should therefore be considered within the scope of the invention.

We claim:

1. A playback apparatus for receiving digital audio material from a network server and providing it to a home audio system for playback, the apparatus comprising:

a user interface that receives commands from a user for selection of an audio composition from a network server, for initiating receipt of the digital audio material comprising portions of the selected audio composition, and for controlling playback of the received digital audio material, wherein the user interface includes a display that shows status of the playback;

a memory that contains operating system instructions and that temporarily stores the digital audio material comprising portions of the selected audio composition, such that digital audio material comprising the complete selected audio composition is not available to the user from the memory; and

a processor that executes the operating system instructions stored in the memory to perform apparatus functions in response to the user commands and to initiate the playback of received digital audio material.

2. A playback apparatus as defined in claim 1, wherein the apparatus functions performed by the processor include display of a menu selection list, from which the user will make the selection of the audio composition.

3. A playback apparatus as defined in claim 2, wherein the apparatus functions performed by the processor include sending a current song list version for the selected musical category to a network server and receiving an indication from the network server if the current song list is in need of updating.

4. A playback apparatus as defined in claim 2, wherein the apparatus functions performed by the processor include sending the user selection to a network server and receiving from the network server the network address of audio material comprising the user selection.

5. A playback apparatus as defined in claim 4, wherein the apparatus sends the user selection to a network directory and user list server and a network audio material server, wherein the directory and user list server checks user information against a list of authorized users to control download of audio material and the audio material server provides the audio material comprising the selected composition.

6. A playback apparatus as defined in claim 5, wherein the directory and user list server sets a copy authorization flag that is provided to the audio material server, and the audio material server checks the copy authorization flag to determine if digital copying at the apparatus will be permitted.

7. A playback apparatus as defined in claim 6, wherein the apparatus functions performed by the processor include processing the received audio material to provide an analog so output signal to the home audio system for playback and listening, and processing the received audio material to provide a digital output stream to a storage media only if digital copying is permitted by the copy authorization flag.

8. A playback apparatus as defined in claim 6, wherein the playback apparatus receives the audio material from the audio material server in a plurality of packets that are temporarily stored in the playback apparatus memory.

9. A playback unit that receives digital audio material from a network server and provides it to a home audio system for playback, the apparatus comprising:

a user interface that receives commands from a user for selection of an audio composition from a network

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server, for initiating receipt of the digital audio material comprising portions of the selected audio composition, and for controlling playback of the received digital audio material, wherein the user interface includes a display that shows status of the playback;

a memory that contains operating system instructions and that temporarily stores the digital audio material comprising portions of the selected audio composition, such that digital audio material comprising the complete selected audio composition is not available to the user from the memory; and

a processor that executes the operating system instructions stored in the memory to perform apparatus functions in response to the user commands and to initiate the playback of received digital audio material, wherein the apparatus functions performed by the processor include (1) display of a menu selection list from which the user will make the selection of the audio composition, (2) sending the user selection to a network server and receiving the audio material comprising the user selection, (3) processing the received audio material to provide an analog output signal to the home audio system for playback and listening, and (4) processing the received audio material to provide a digital output stream to a storage media only if digital copying permission was granted by a received copy authorization flag.

10. A playback apparatus as defined in claim 9, wherein the playback apparatus receives the audio material from the audio material server in a plurality of packets that are temporarily stored in the playback apparatus memory.

11. A playback apparatus as defined in claim 9, wherein the apparatus functions performed by the processor include sending a current song list version for the selected musical category to a network server and receiving an indication from the network server if the current song list is in need of updating.

12. A playback apparatus as defined in claim 11, wherein the apparatus sends the user selection to a network directory and user list server and a network audio material server, wherein the directory and user list server checks user information against a list of authorized users to control download of audio material and the audio material server provides the audio material comprising the selected composition.

13. A playback apparatus as defined in claim 12, wherein the directory and user list server sets a copy authorization flag that is provided to the audio material server, and the audio material server checks the copy authorization flag to determine if digital copying at the apparatus will be permitted.

14. A playback apparatus as defined in claim 13, wherein the playback apparatus receives the audio material from the audio material server in a plurality of packets that are temporarily stored in the playback apparatus memory.

15. A method of operating a playback apparatus that receives digital audio material from a network server and provides it to a home audio system for playback, comprising the steps of:

selecting an available music category through a user interface supported by an operating system that is stored in memory of the playback apparatus;

sending a current song list version for the selected music category to a network server and receiving an updated song list if the current song list is in need of updating;

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selecting an available composition, sending the selected composition title to a network server, and receiving from the network server the network address of a network audio material server at which audio material comprising the user selection is stored;

receiving the audio material from the network audio material server; and

processing the received audio material to provide an analog output signal to the home audio system for playback and listening, and processing the received audio material to provide a digital output stream to a digital storage media only if digital copying is permitted by a copy authorization flag.

16. A method as defined in claim 15, wherein the step of receiving the audio material comprises receiving the audio material from the network audio material server in a plurality of packets that are temporarily stored in memory of the playback apparatus.

17. A method as defined in claim 15, further including the steps of sending the user selection to a network directory and user list server and the network audio material server, wherein the directory and user list server checks user information against a list of authorized users to control download of audio material.

18. A method as defined in claim 17, wherein the copy authorization flag that is checked in the step of processing the received audio material is set by the directory and user list server and is provided to the network audio material server, and the audio material server checks the copy authorization flag to determine if digital copying at the apparatus will be permitted.

19. A method of operating a playback apparatus that receives digital audio material from a network server and provides it to a home audio system for playback, the method comprising:

receiving user commands through an operating system that is stored in semiconductor memory for selection of an audio composition from a network server;

receiving digital audio material from the network server; temporarily storing the digital audio material comprising portions of the selected audio composition in playback apparatus memory, such that digital audio material comprising the complete selected audio composition is not stored in the memory at the same time; and

processing the received audio material to provide an analog output signal to the home audio system for playback and listening, processing the received audio material to provide a digital output stream to a storage media only if digital copying permission was granted by a received copy authorization flag.

20. A method as defined in claim 19, wherein the step of receiving digital audio material comprises receiving the audio material from an audio material server in a plurality of packets that are temporarily stored in the playback apparatus memory.

21. A playback apparatus as defined in claim 19, wherein the apparatus functions performed by the processor include sending a current song list version for the selected musical category to a network server and receiving an indication from the network server if the current song list is in need of updating.

22. A method as defined in claim 21, wherein the playback apparatus forwards the user request to a network directory and user list server and to a network audio material server,

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wherein the directory and user list server checks user information against a list of authorized users to control download of audio material and the audio material server provides the audio material comprising the selected composition upon authorization from the directory and user list server.

23. A method as defined in claim 22, wherein the directory and user list server sets a copy authorization flag that is provided to the audio material server, and the audio material

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server checks the copy authorization flag to determine if digital copying at the playback apparatus will be permitted.

24. A method as defined in claim 23, wherein the playback apparatus receives the audio material from the audio material server in a plurality of packets that are temporarily stored in the playback apparatus memory.

\* \* \* \* \*

# **EXHIBIT 13**



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**Wolff et al.**

(10) **Patent No.:** **US 7,472,353 B1**  
(45) **Date of Patent:** **Dec. 30, 2008**

(54) **REMOTE CONSOLE FOR NETWORK APPLICATION SERVERS**

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(73) Assignee: **Ricoh Co., Ltd.**, Tokyo (JP)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 520 days.

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(21) Appl. No.: **09/629,781**

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(Continued)

(51) **Int. Cl.**  
**G06F 3/00** (2006.01)  
**G06F 15/16** (2006.01)

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(52) **U.S. Cl.** ..... **715/764**; 715/716; 715/733; 715/810; 715/835; 715/764; 715/205; 707/10; 709/219

(Continued)

(58) **Field of Classification Search** ..... 345/838, 345/727, 728, 764, 704, 716, 719; 707/9, 707/10; 709/201, 203, 216-219; 715/704, 715/716-719, 727, 733, 738, 741, 764, 835, 715/838, 846, 978, 728, 205, 968, 810

*Primary Examiner*—X. L. Bautista  
(74) *Attorney, Agent, or Firm*—Blakely, Sokoloff, Taylor & Zafman LLP

See application file for complete search history.

(57) **ABSTRACT**

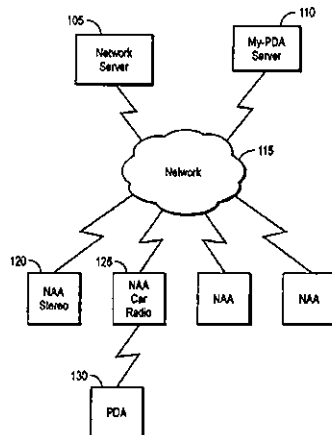
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A method and system that organize and retrieve multimedia objects. A controller may select an identifier associated with a media object to send a request to play the media object. The controller may send the request by transmitting the identifier stored in the controller. An appliance receives the request from the controller. The appliance retrieves the media object from a first server via a network connection when the media object is not stored in the appliance. Then the appliance may play the media object.

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**36 Claims, 8 Drawing Sheets**



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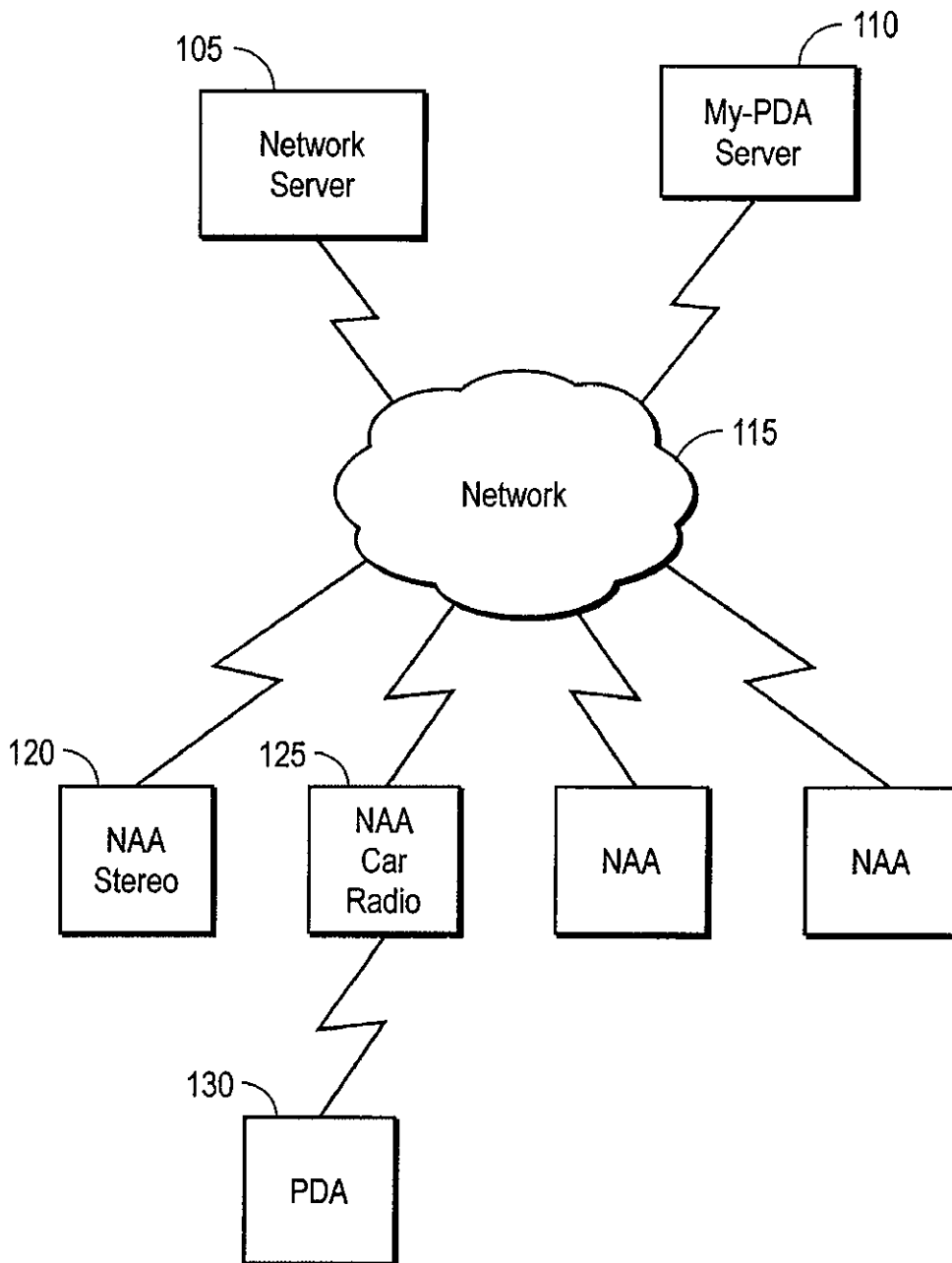


FIG. 1



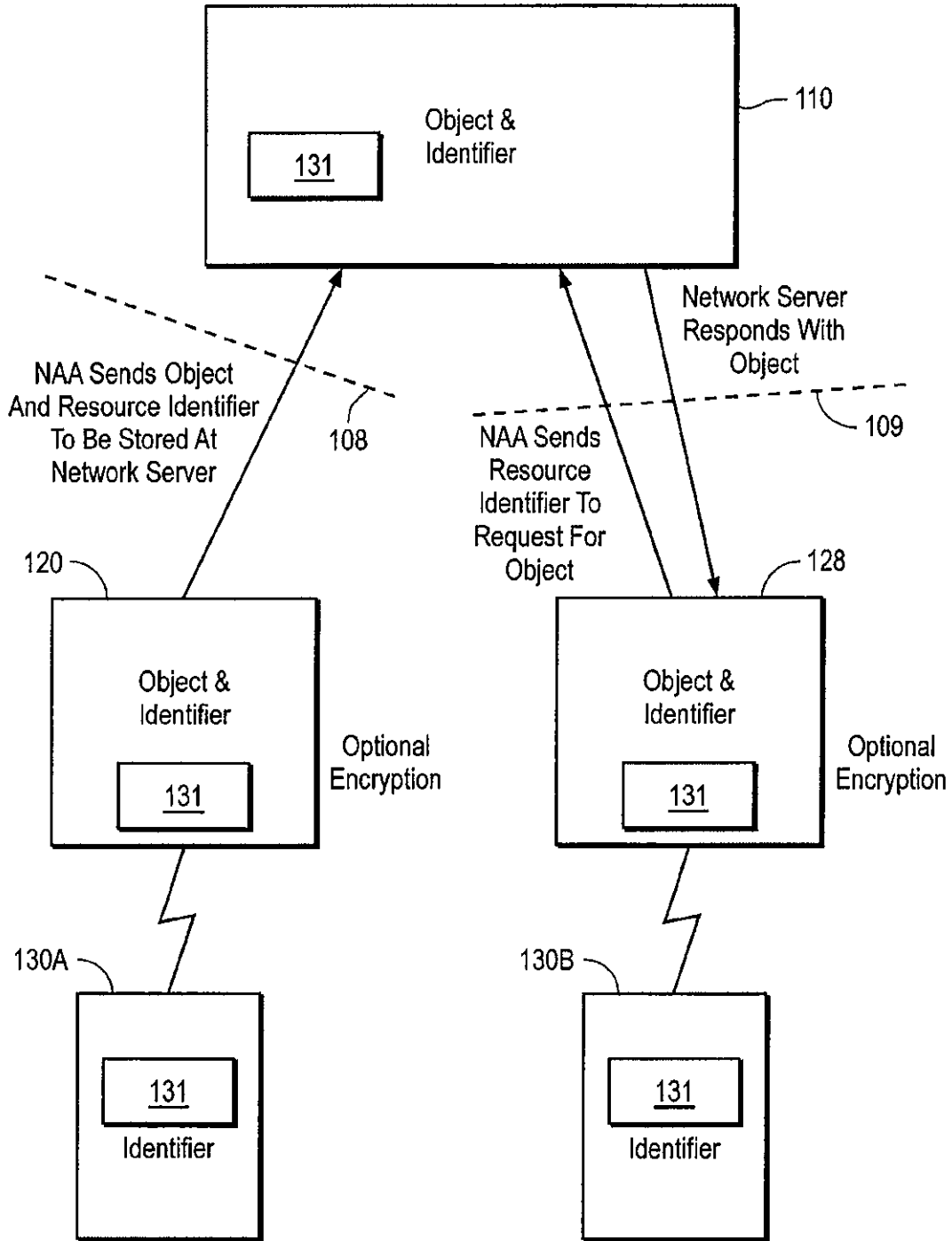


FIG. 2

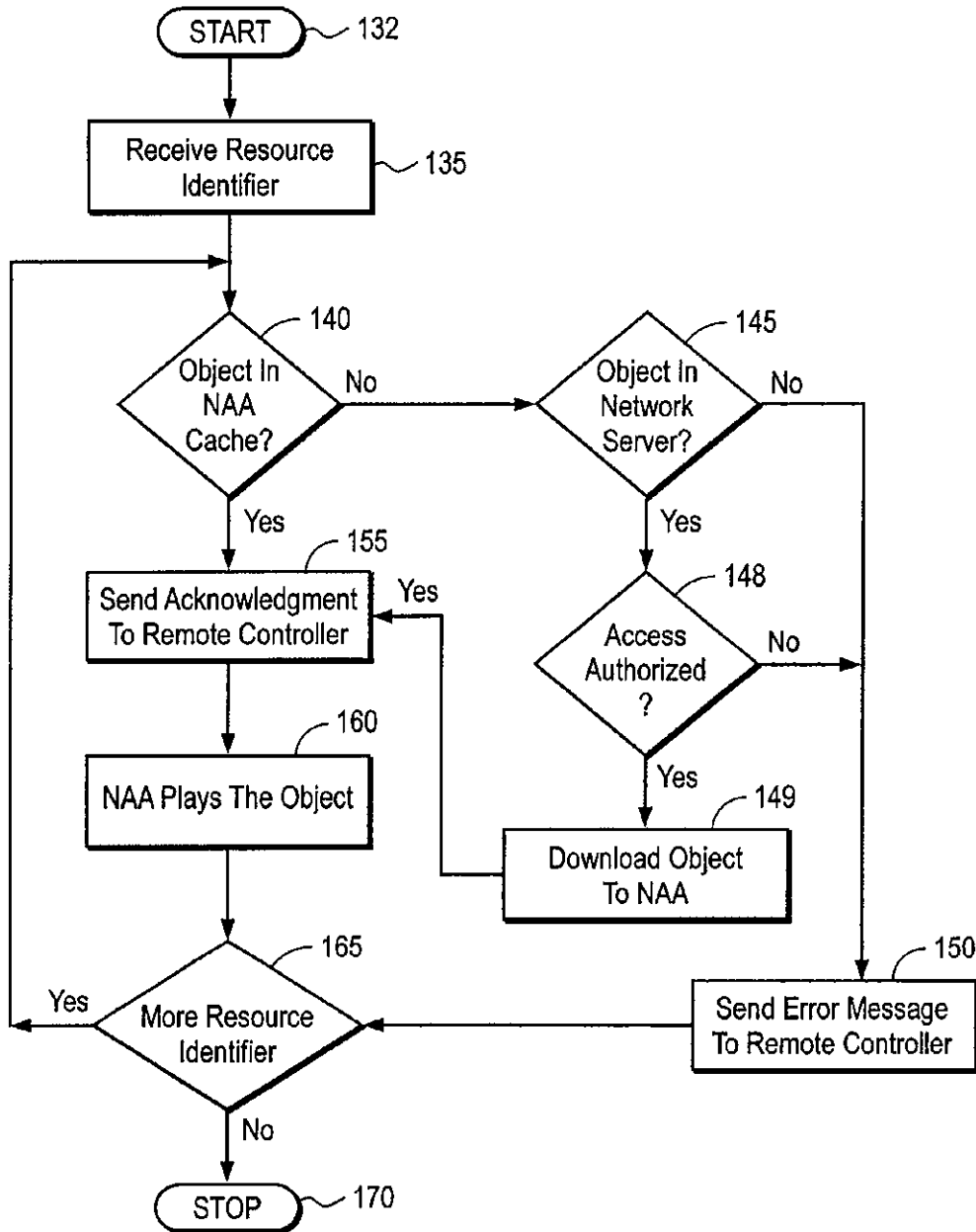


FIG. 3

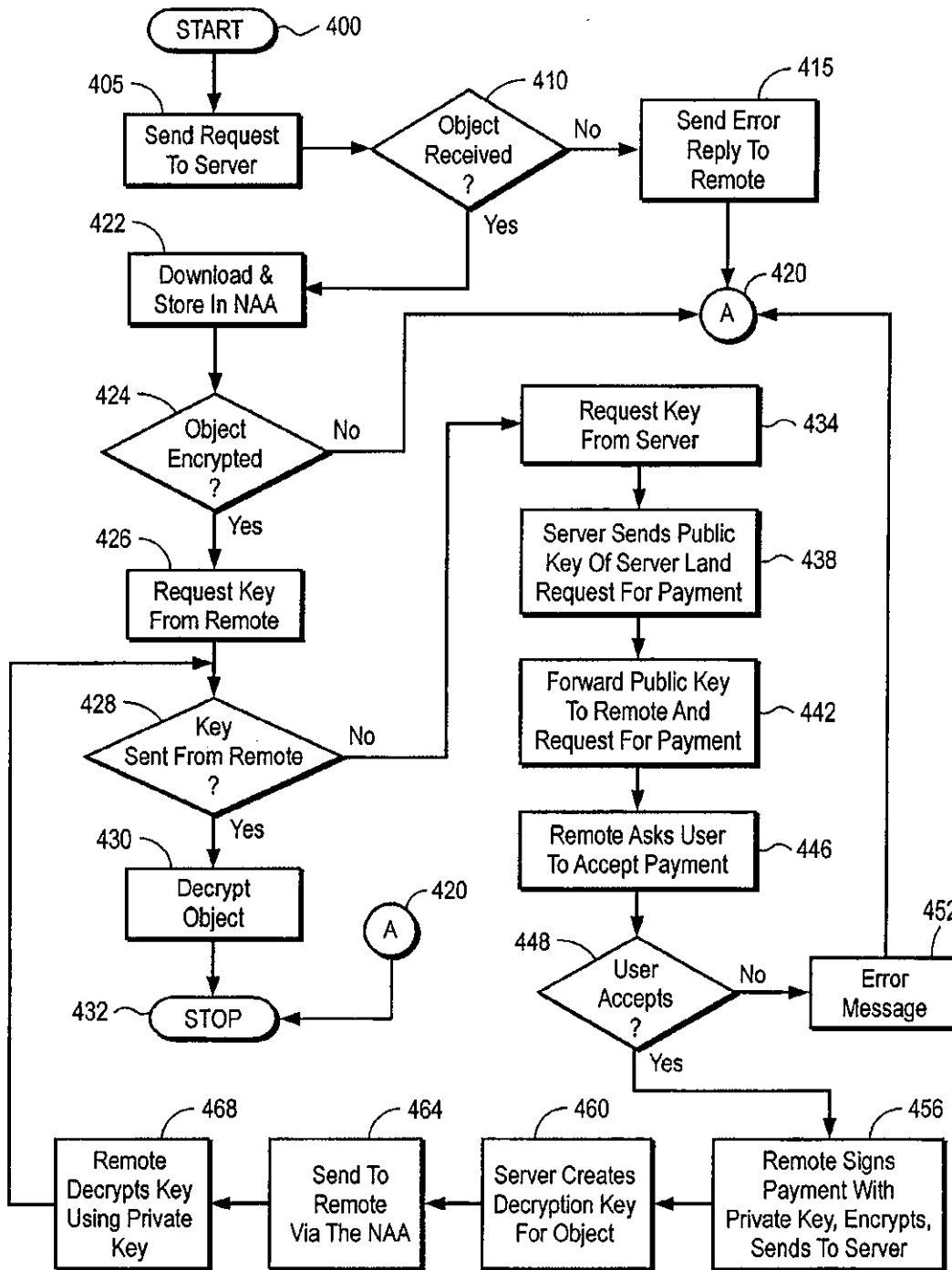


FIG. 4

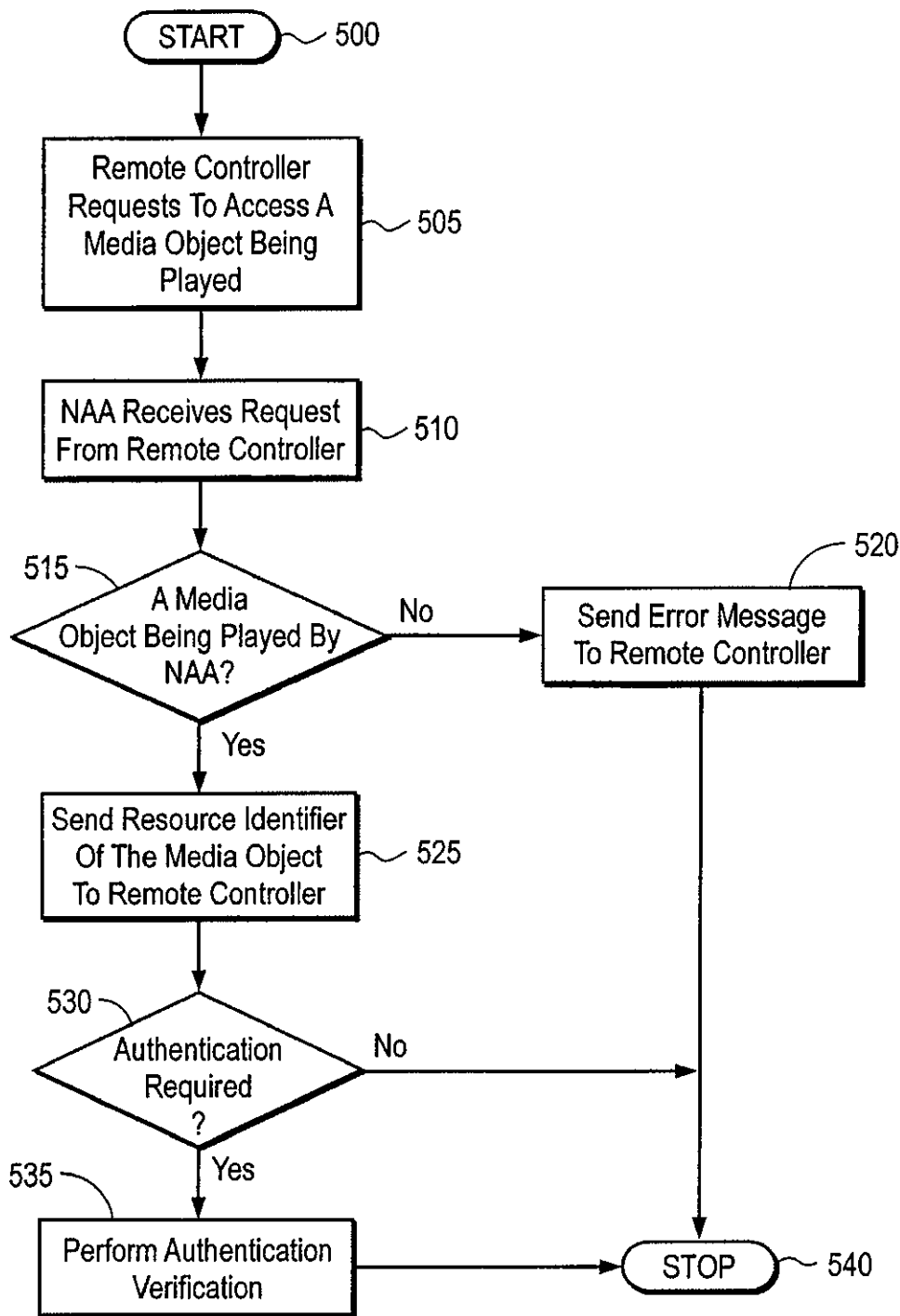


FIG. 5

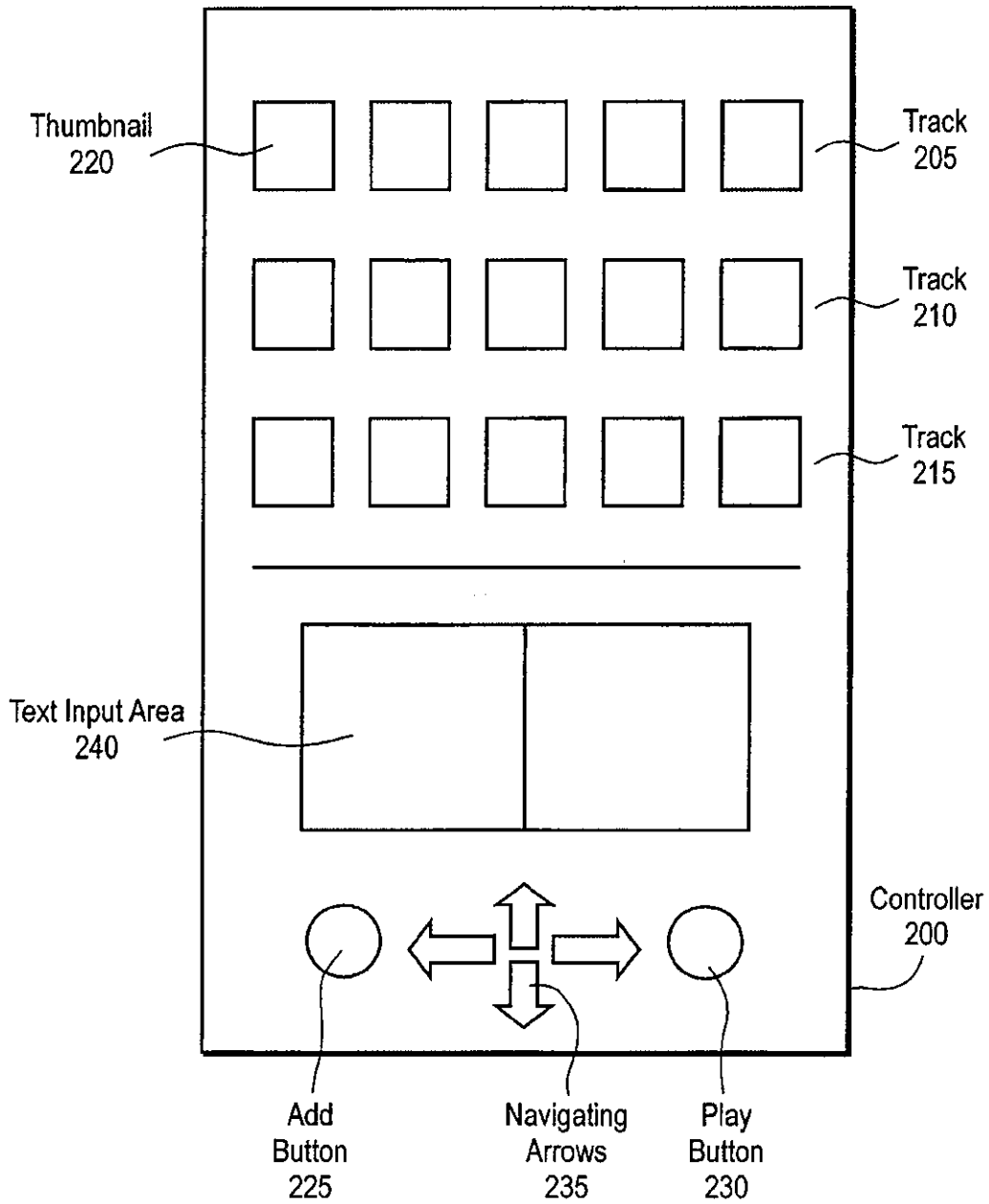


FIG. 6

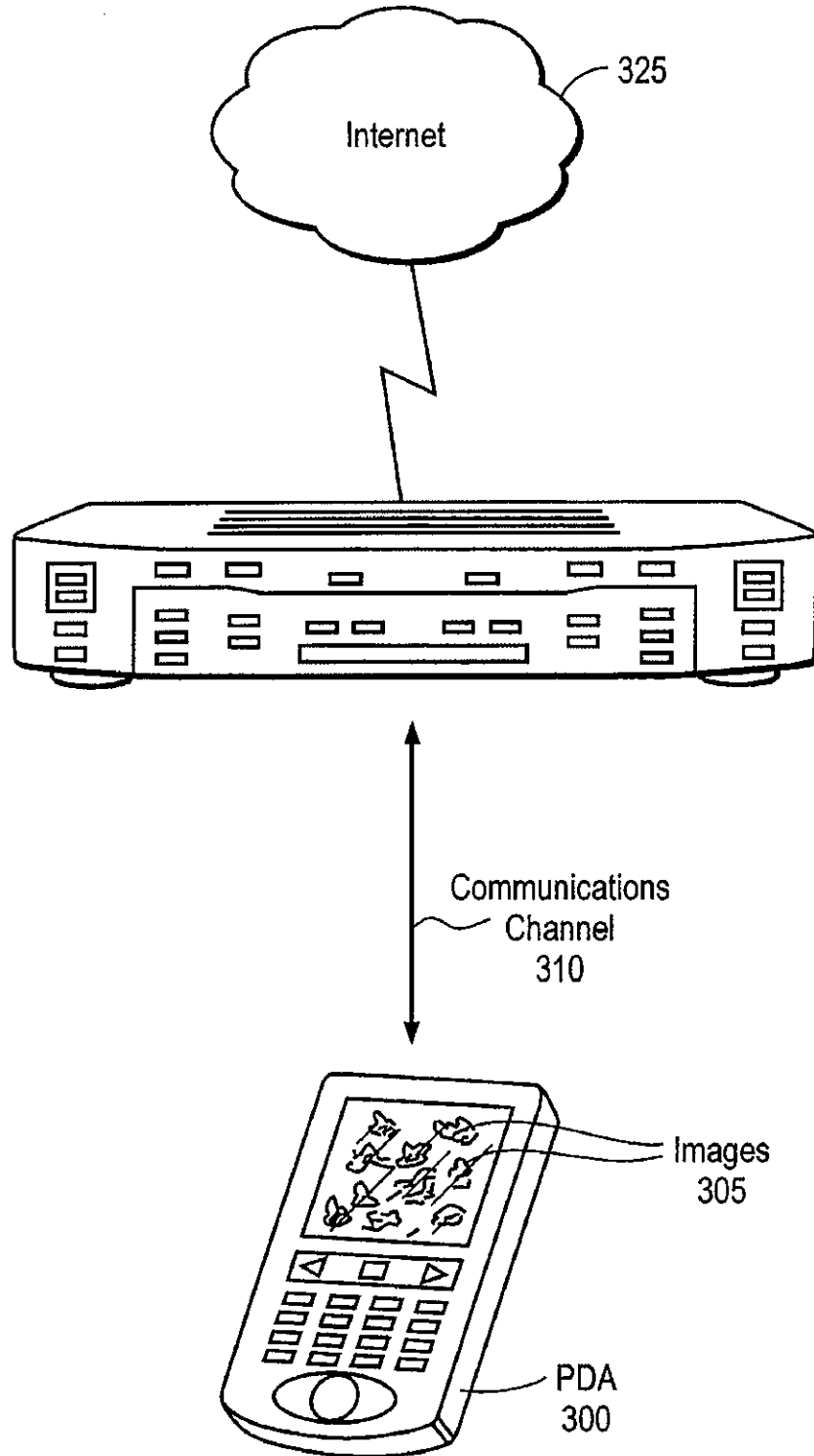


FIG. 7

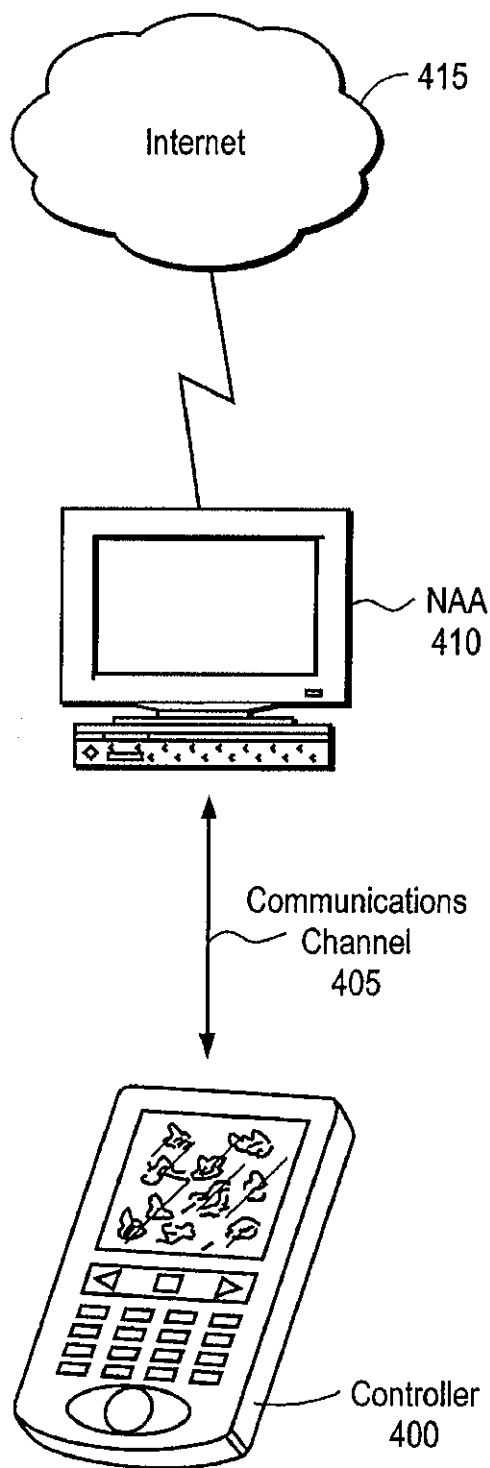


FIG. 8

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## REMOTE CONSOLE FOR NETWORK APPLICATION SERVERS

This application is a continuation in part of Ser. No. 09/465,982, filed on Dec. 16, 1999.

### FIELD OF THE INVENTION

The present invention relates generally to field of image retrieval and organization. More specifically, the present invention is directed to retrieving and organizing multimedia objects stored on networked services.

### BACKGROUND

Multimedia is a term used to describe the combined use of different kinds of information. Examples of the different kinds of information include text documents, music, images, voice recordings, etc. The combined information is sometimes referred to as multimedia objects.

As the World Wide Web (WWW) becomes more popular, it is apparent that multimedia plays a critical role in effectively exchanging and disseminating information among users of the web. Multimedia can be used in many different applications, such as, for example, digital story telling, employee training, online music video, document with voice annotations, etc.

As the use of multimedia expands, there is a need for storing and retrieving the multimedia objects. In order for the multimedia objects to be easily retrievable, the multimedia objects have to be stored in a location where everyone can share and access them. One way of doing this is to store the multimedia objects on servers connected to the Internet. Using the HTTP protocol, a user from anywhere in the world can access the multimedia objects as long as that user knows about the URL associated with the multimedia objects. However, the user may not have control over the server(s) in order to organize the media objects according to their retrieval needs.

One main requirement to this approach is that in order to access the Internet, the user needs to have an Internet access device such as, for example, a personal computer. What is needed is a way to organize the multimedia objects such that users can easily access them.

### SUMMARY OF THE INVENTION

A method and system that organize and retrieve multimedia objects are described. In one embodiment, a controller is configured to select an identifier associated with a media object to send a request to play the media object. The controller sends the request by transmitting the identifier stored in the controller. An appliance is configured to receive the request from the controller. The appliance retrieves the media object from a first server via a network connection when the media object is not stored in the appliance. The appliance plays the media object.

### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example in the following drawings in which like references indicate similar elements. The following drawings disclose various embodiments of the present invention for purposes of illustration only and are not intended to limit the scope of the invention.

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FIG. 1 illustrates an exemplary network embodiment with a remote controller, a network access appliance and a server.

FIG. 2 is an exemplary diagram illustrating the remote controller accessing multiple network access appliances.

FIG. 3 is an exemplary flow diagram illustrating a request to play a media object.

FIG. 4 is an exemplary flow diagram illustrating an access authorization.

FIG. 5 is an exemplary flow diagram illustrating a request to acquire a media object.

FIG. 6 illustrates an exemplary embodiment of a remote controller.

FIG. 7 illustrates an exemplary representation of a remote controller with a stereo network access appliance.

FIG. 8 illustrates an exemplary representation of a remote controller with a document network access appliance.

### DETAILED DESCRIPTION

A remote control system for network access appliances is disclosed. The following detailed description sets forth numerous specific details to provide a thorough understanding of the invention. However, those of ordinary skill in the art will appreciate that the invention may be practiced without these specific details. In other instances, well-known methods, procedures, protocols, components, algorithms, and circuits have not been described in detail so as not to obscure the invention.

Some portions of the detailed descriptions that follow are presented in terms of algorithms and symbolic representations of operations on data bits within a computer memory. These algorithmic descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. An algorithm is here, and generally, conceived to be a self-consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, or the like.

It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise as apparent from the following discussion, it is appreciated that throughout the description, discussions utilizing terms such as "processing" or "computing" or "calculating" or "determining" or "displaying" or the like, refer to the action and processes of a computer system, or similar electronic computing device, that manipulates and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

The present invention also relates to apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, or it may comprise a general-purpose computer selectively activated or reconfigured by a computer program stored in the computer. Such a computer program may be stored in a computer readable storage medium, such as, but is not limited to, any type of disk including floppy disks, optical disks, CD-ROMs, and mag-



netic-optical disks, read-only memories (ROMs), random access memories (RAMs), EPROMs, EEPROMs, magnetic or optical cards, or any type of media suitable for storing electronic instructions, and each coupled to a computer system bus.

The algorithms and displays presented herein are not inherently related to any particular computer or other apparatus. Various general-purpose systems may be used with programs in accordance with the teachings herein, or it may prove convenient to construct more specialized apparatus to perform the required method steps. The required structure for a variety of these systems will appear from the description below. In addition, the present invention is not described with reference to any particular programming language. It will be appreciated that a variety of programming languages may be used to implement the teachings of the invention as described herein.

#### Overview

A remote controller system that provides a user capabilities to retrieve multimedia objects is disclosed. The multimedia objects may be formed by using a combination of different formats such as, for example, Moving Picture Expert Group (MPEG) video's, MPEG audio Layer-3 (MP3), music compact discs (CD), etc. The multimedia objects are also referred to as media objects. In one embodiment, the system is a hand held device such as, for example, the Personal Digital Assistant (PDA) from Palm Inc. in Santa Clara, Calif., that allows the user to remotely select a media object from a network access appliance (NAA). The network access appliance is connected to a network allowing it to retrieve media objects stored in one or more servers. The servers may communicate with the NAA through the same network such as, for example, the Internet. In one embodiment, the NAA has a local cache that stores the media objects. For example, the NAA cache may store media objects that the user has identified as the user's favorites. This allows the NAA to quickly respond to the user's request when the user selects a favorite media object. When the NAA cache does not have the requested selection, the NAA retrieves the requested selection from a specified server.

FIG. 1 illustrates an exemplary network embodiment with the remote controller, the network access appliance and the server. When the user points the remote controller 130 at an NAA 120, 125, 128 the remote controller 130 transmits sufficient information for the NAA 120, 125, 128 to identify the desired request from the user. In one embodiment, the communication between the remote controller 130 and the NAA 120, 125, 128 uses the Infrared Data Association (IrDA) Data Protocols specification with the Infrared Object Exchange Protocol (Ir OBEX) Data Protocol as published by the Infrared Data Association (IrDA). Using this protocol, the remote controller 130 sends a resource identifier such as, for example, a uniform resource locator (URL), to the NAA 120, 125, 128 to request the NAA 120, 125, 128 to play the media object associated with the resource identifier. The NAA 120, 125, 128 then retrieves the media object from the network (e.g., Internet) or from a NAA local cache, sends an acknowledgement to the remote controller 130, and begins playing/displaying the media object.

In one embodiment, the remote controller 130 sends multiple URLs in one request and the NAA 120, 125, 128 plays each in order. Optionally, the remote controller 130 may send (e.g., upload) the actual media object to be played. In one embodiment, the remote controller 130 may send a request to the NAA 120, 125, 128 for the resource identifier of the currently playing object. The NAA 120, 125, 128 responds by

sending the resource identifier and optionally a reduced graphical representation (e.g., thumbnail image) of the object. Optionally, the NAA 120, 125, 128 may also send data comprising the object.

Depending on the type of NAA 120, 125, 128 and the request, the NAA 120, 125, 128 may play the media object associated with the request when the media object is an audio clip or a video clip, or the NAA 120, 125, 128 may display the media object when the media object is a document. There may be different NAA types to handle the different formats of the media objects.

In one embodiment, a media object is displayed as a thumbnail on the remote controller 130. The remote controller 130 may also store the resource identifier (e.g., URL) corresponding to each of the thumbnail images. For example, to play a desired media object the user selects the corresponding thumbnail image and presses a play button. The media object may need to be compatible with the NAA 120, 125, 128 in order for it to be played by the NAA 120, 125, 128. In one embodiment, an error message may be sent by the NAA 120, 125, 128 to the remote controller 130 indicating a format incompatibility. For example, when the user selects a media object corresponding to a multimedia document while pointing the remote controller 130 to the car radio NAA 125, an incompatible format error message is received by the remote controller 130. The NAA 120, 125, 128 can be any device capable of receiving the requests from the remote controller 130.

In one embodiment, each of the media objects stored or played by the NAA is associated with a resource identifier. For example, the stereo NAA 120 of FIG. 1 may be playing a song that it does not have in its local cache. Since the NAA 120 knows about the resource identifier associated with that song, the NAA 120 can retrieve the song from network server 105. In one embodiment the network server 105 stores multiple media objects.

In another embodiment, a personalized server in the network is available to provide the users of the remote controller 130 a way to maintain the information stored on the remote controller 130. Each user of the remote controller 130 has a personalized server 110 such as, for example, "My PDA Server" to keep track of all the services associated with the remote controller 130. In one embodiment, "My PDA Server" is implemented as a server directory corresponding to each remote controller 130, and all the different personalized servers are located in a server system. The user may add new resource identifiers to the personalized server 110, and the user may remove resource identifiers from the personalized server 110. In other words, the personalized server 110 keeps a copy of each resource identifier stored in the remote controller 130. Furthermore, the personalized server may also keep a copy of the media object corresponding to each of the resource identifiers.

When the remote controller 130 is synchronized with the personalized server 110, all the thumbnail images and the corresponding resource identifiers are loaded onto the remote controller 130. The process of synchronization may be done through a docking cradle connected to the Internet. In one embodiment, the NAA 120, 125, 128 periodically accesses the personalized server 110 and update the local cache in the NAA with the appropriate media objects based on the resource identifiers stored in the personalized server 110. The media objects associated with these resource identifiers may be located at different sites in the network.

FIG. 2 is a diagram illustrating one exemplary embodiment of accessing media objects on multiple NAA devices. Device 130A is a remote controller. In this diagram, the device 130A

is the same remote controller as the device 130B, just at a different time and location, and is referred to as the remote controller 130. Initially, a copy of the media object 131 is stored in the NAA 120. This copy may be obtained by any number of methods such as, for example, downloaded from a server, copied over from the remote controller 130, read off a physical media format such as, for example, a compact disc (CD), wireless transfer from a digital camera, or other means. Automatically or in response to a request from the remote controller 130, the NAA 120 makes a connection with the personalized server 110 and transfers a copy of the media object 131 to the personalized server 110. In one embodiment, the NAA 120 may encrypt the media object 131 using a key obtained from the remote controller 130. In one embodiment, the remote controller 130 also provides a unique identifier for the media object 131 to the NAA 120. The NAA 120 then transfers this unique identifier along with the media object 131 to the personalized server 110. In an alternative embodiment, the NAA 120 or the personalized server 110 assigns a unique identifier to the media object 131 and transmits this unique identifier back to the remote controller 130.

At some later time, the remote controller 130 may request the NAA 120 to play the media object 131 by transmitting the unique identifier associated with the media object 131 to the NAA 128 as described above. The NAA 128 may not be able to communicate directly with the NAA 120 to request the media object 131 due to the firewall 108 or other reasons. However, the NAA 128 can communicate with the personalized server 110 and request the media object 131 using the unique identifier provided by remote controller 130. The personalized server 110 then sends the media object 131 to the NAA 128. The NAA 128 may optionally decrypt the media object 131 using a key provided by the remote controller 130.

FIG. 3 is a flow diagram illustrating an exemplary request to play a media object. The flow diagram starts at block 132. When the user activates a play function, such as, for example, pressing a play button on a remote controller, the remote controller sends one or more resource identifiers corresponding to the media object(s) to the specified NAA using a communication channel such as, for example, IrOBEX. At block 135, the NAA receives the resource identifier(s) and uses it as an identifier to locate the requested media object. For each resource identifier, the NAA first determines to see if the resource identifier for the requested media object may have already been stored in the cache within the NAA, as shown in block 140. When the requested media object is found in the cache, the NAA proceeds by sending an acknowledgement to the remote controller, as shown in block 155. Alternatively, when the requested media object is not found in the cache, the NAA attempts to locate the requested media object, using the resource identifier, in a network server (e.g., network server 105 of FIG. 1), as shown in block 145. When the requested media object is not found in the cache or in the network server, an error message is sent to the remote controller, as shown in block 150.

At block 145, when the requested media object is found in the network server, an authentication may be performed to determine if the user is authorized to retrieve the media object from the network server, as shown in block 148. In one embodiment, the user is authenticated when the user has subscribed to the media object by paying an access fee. Authentication information, such as, for example, a user name and password may be sent to the NAA in conjunction with the requested media object. When the user is not authenticated, an authentication failure message is sent to the remote controller, as shown in block 150. The remote controller may re-send the same resource identifier request with the appro-

appropriate authentication such as, for example, the user name and password. When the user is authenticated, the requested media object is sent (e.g., downloaded) from the network server to the NAA, as shown in block 149. An acknowledgement may be sent by the NAA to the remote controller, as shown in block 155. The media object corresponding to the resource identifier is then played by the NAA, as shown in block 160. For example, when the NAA is a stereo receiver and the remote controller sends a resource identifier corresponding to a particular song, the NAA plays that song. When the NAA is a personal computer and the resource identifier sent by the remote controller corresponds to a particular document, the NAA displays that particular document. In block 165, a determination is made to see if there is any remaining resource identifier to be processed. When there are more resource identifiers, the flow returns to block 140 to process the next resource identifier. When all the resource identifiers have been processed, the flow stops at block 170.

FIG. 4 is a flow diagram illustrating one embodiment of an access authorization process performed by the network server. FIG. 4 provides additional detailed information for the process performed in block 148 of FIG. 3. As described in FIG. 3, when the media object is not in the NAA, the NAA may send the resource identifier along with a user name and a password to the network server to request for the media object, as shown in block 405. At block 410, a determination is made to see if the requested media object does not exist in the network server and thus can not be received by the NAA. When that is the case, an error message is sent to the remote controller, as shown in block 415. However, when the requested media object exists in the network server, a copy of the requested media object is downloaded and stored in the NAA, as shown in block 422. The media object sent from the network server may or may not be decrypted. If the media object is not encrypted, as determined by block 424, the flow moves to block 420 which ends at block 432, and the process is completed.

When the media object sent by the network server is encrypted, the NAA requests for a private key from the remote controller, as shown in block 426. If the remote controller has the private key (e.g., the user of the remote controller is authorized), then it is used to decrypt the media object, as shown in blocks 428 and 430. The process is completed at block 432.

However, when the remote controller does not have the key, the process flows from block 428 to block 434. At block 434, the NAA sends a request for a decryption key to the network server. At block 438, the network server responds to the NAA with a public key of the network server and request the NAA to pay to access the requested media object. At block 442, the NAA forwards the network server public key and the payment request to the remote controller. At block 446, the remote controller requests the user to accept the payment requirement from the network server. At block 448, a determination is made to see if the user accepts the payment requirement. If the user rejects the payment requirement, an error message may be generated by the NAA to indicate that the request to play the media object can not be satisfied, as shown in block 452. The process then flows to block 420 and is completed at block 432.

If the user accepts the payment requirement, the process flows from block 448 to block 456. At block 456, the remote controller signs a payment information with a private key. The remote controller then encrypts the payment information with the network server public key. In one embodiment, the encrypted payment information is then sent to the network server via the NAA along with the original request for the

media object. In another embodiment, the network server remembers the requested media object from the previous request, and the remote controller may only need to send the encrypted payment information to the network server.

At block 460, the network server creates an encryption key for the requested media object. The network server also encrypts the encryption key for the requested media object with the private key of the remote controller. At block 464, the encrypted encryption key for the requested media object is sent by the network server to the remote controller via the NAA. At block 468, the remote controller decrypts the encryption key for the requested media object using the remote controller private key. The encryption key for the requested media object is then sent to the NAA. The process flows back to block 428 where the NAA receives the encryption key for the requested media object from the remote controller. At block 430, the NAA uses the encryption key for the requested media object to decrypts the media object. The process is completed at block 432.

FIG. 5 is an exemplary flow diagram for processing a request by a remote controller to acquire an object being played. The flow diagram starts at block 500. At block 505, the remote controller sends a request to the NAA to acquire a media object being played on the NAA. For example, the user may initiate this request by pressing an "add" button on the remote controller. The media object may be played in response to a play command from another remote controller. At block 510, the NAA receives the request from the remote controller. At block 515, a determination is made to see if a media object is actually being played by the NAA. For example, the request from the remote controller may have been sent accidentally when the NAA is not playing any media object. Those skilled in the art would recognize that playing the media object may include, for example, displaying a document, playing an audio clip, playing a video clip, etc. When there is no media object being played by the NAA, an error message is sent to the remote controller, as shown in block 520, and the process ends at block 540.

In one embodiment, when there is a media object being played by the NAA, the network server or the NAA creates a unique resource identifier for the media object for that particular remote controller. The NAA then sends this unique resource identifier to the remote controller, as shown in block 525. The unique resource identifier may be used to access/encode authentication information in addition to identify the media object.

The remote controller may need to be authenticated in order to be able to subsequently send a request to play the same media object. For example, there may be a cost associated with having access to the media object. At block 530, a determination is made to see if authentication is required. When there is no such requirement (e.g., the media object is free), the process ends at block 540. However, when the authentication is required, the process flows to block 535 where the authentication process is performed. In one embodiment, the process performed in block 535 is similar to the process performed in the flow diagram of FIG. 4. In another embodiment, the authorization and payment may happen at a later time when user requests to play the object. In this case, the process performed in blocks 530 and 535 are bypassed and the block 525 flows directly to block 540.

FIG. 6 illustrates an exemplary embodiment of a remote controller. In this embodiment, there are three tracks 205, 210, 215 with each track having multiple numbers of thumbnail images 220. In one embodiment, a thumbnail image can be selected by using navigating arrows 235 on the remote controller 200. When a desired thumbnail image is selected,

and a play button 230 is pressed, the remote controller 200 sends a signal containing the resource identifier out to the NAA. The resource identifier corresponds to the selected thumbnail image. In one embodiment, the outgoing signal is sent through an output port designed for wireless communication.

The exemplary remote controller 200 has three tracks 205, 210 and 215 to allow the user to organize the media objects (thumbnail images). This provides the user an easy way to organize the media objects by the track. For example, the media objects displayed on the first track 205 may be a scrollable list with all the media objects that are known to the remote controller 200. The user can select one of the media objects 220 on any track using the navigation controls. In one embodiment, the third track 215 is used as a working track. For example, the user can create a play list containing the user favorite songs by selecting music media objects from the first track 205 and add them to the third track 215. When the user is satisfied with the play list, the user can move the play list to the second track 210. In one embodiment, each thumbnail image on the second track 210 represents a play list created by the user.

When the remote controller is synchronized with the personalized server 110, the play list is updated in the personalized server 110 and the indicated media objects may eventually be accessed and cached by the appropriate NAA. In one embodiment, the synchronization is done periodically such as, for example, every 24 hours. This capability allows the user to easily find and select individual media objects or entire play lists on the remote controller and request an NAA to play them. When the NAA has cached the media objects (by examining stored play lists) the user will not have to wait for any downloads from the network server. Other functions available on the remote controller may include "stop", "pause", etc. to provide the user additional control capabilities. It would be apparent to one skilled in the art that there may be other ways of organizing the media objects to make them easily retrievable. For example, the media objects may be organized using two or four tracks, in a hierarchical list or just a list of the resource identifiers.

In one embodiment, the remote controller 200 of FIG. 6 has an "add" button 225 that allows the user to add the resource identifier of the song currently played to the remote controller 200. Upon receiving the "add" request signal from the remote controller 200, the NAA responds with the resource identifier information. Similarly, the resource identifier for a multimedia document is transmitted when the document is being displayed by a document NAA. In one embodiment, each thumbnail is stored along with additional information about the associated media object such as, for example, the date the media object was created or authentication and payment information. In another embodiment, the remote controller 200 provides the user a capability to generate text information about the media objects. For example, the user may use the text input area 240 to add notes or comments about the selected media object.

In yet another embodiment, the remote controller 200 may also include the ability for the user to record audio narratives associated with the selected media object. Additionally, the remote controller 200 may also include the ability to communicate with other remote controllers to exchange or share media objects. For example, the user of the remote controller may send a favorite play list to another user.

FIG. 7 illustrates an exemplary representation of a remote controller with a stereo network access appliance. In one embodiment, the remote controller 300 is a PDA. The PDA 300 has three tracks of thumbnail images 305. Each thumb-

nail image can be associated with a media object and a corresponding resource identifier. The communication channel 310 between the PDA 300 to the stereo NAA 320 is bi-directional. This allows the NAA 320 to receive commands or requests from the PDA 300 and to transmit information to the PDA 300. For example, the PDA may transmit the resource identifier of the song that the user wants to add to the play list on the PDA 300. The stereo NAA 320 is connected to the Internet 325 to periodically update the content of its cache.

FIG. 8 illustrates an exemplary representation of a remote controller with a document network access appliance. The PDA 400 communicates with the document NAA 410 through the communication channel 405. As discussed previously, the communication channel 405 may be a wireless channel. The NAA 410 may be any device capable of displaying a document such as, for example, a personal computer. The NAA 410 accesses the Internet to retrieve necessary information to update its cache storage. This updating process allows the NAA 410 to respond quickly to the user's request. In one embodiment, when cache storage is large enough, the user may have all of the requests satisfied locally without the NAA 410 having to access the Internet. It would be apparent to one skilled in the art that the NAA 410 can be any Internet connected device capable of playing the media object of a compatible format. For example, the NAA 410 can be a television that can be used to play a video related media object.

From the above description and drawings, it will be understood by those of ordinary skill in the art that the particular embodiments shown and described are for purposes of illustration only and are not intended to limit the scope of the invention. Those of ordinary skill in the art will recognize that the invention may be embodied in other specific forms without departing from its spirit or essential characteristics. References to details of particular embodiments are not intended to limit the scope of the claims.

What is claimed is:

1. A system comprising:
  - a controller configured to select an identifier associated with a media object and to send a request to play the media object identified by the identifier, wherein the controller sends the request by wirelessly transmitting the request having the identifier stored in the controller over a first network, the first network being a wireless network;
  - an appliance configured to receive the request having the identifier from the controller over the wireless network, to determine whether the identified media object is stored in the appliance, to retrieve the media object from a first server via a second network different than the first network when the media object is not stored in the appliance, and to play the media object in response to the request, wherein the controller and the first server are synchronized on a predetermined time period to provide the controller with identifiers for identifying each media object stored on the first server.
2. The system of claim 1, wherein the first server stores the media objects corresponding to the identifiers stored in the controller.
3. The system of claim 1, wherein the media object is retrieved from the first server using the identifier received from the controller.
4. The system of claim 1, further comprising a second server coupled to the network, the second server storing at least the media objects stored in the first server.

5. The system of claim 4, wherein the appliance is further configured to retrieve the media object from the second server when the media object is not found in the first server.

6. The system of claim 5, wherein the media object retrieved from the second server is in a decrypted form.

7. The system of claim 5, wherein the media object retrieved from the second server is in an encrypted form.

8. The system of claim 7, wherein a decryption key for the media object is stored in the controller.

9. The system of claim 8, wherein the decryption key is stored in the controller after the controller sends a payment information to the second server.

10. The system of claim 9, wherein the appliance receives the decryption key from the controller to decrypt the media object.

11. The system of claim 1, wherein the identifier is selected by selecting a visual representation of the identifier.

12. The system of claim 11, wherein the visual representation comprises a thumbnail image representing the media object.

13. The system of claim 12, wherein the controller organizes thumbnail images in groups.

14. The system of claim 13, wherein the groups comprise: a first group including all thumbnail images stored in the controller, and a second group including selected thumbnail images from the first group.

15. The system of claim 14, wherein the second group comprises:

a first subgroup including one or more playlists, each of the playlists comprising one or more thumbnail images; and a second subgroup including one or more thumbnail images in a playlist being created.

16. The system of claim 15, wherein the controller sends one play list to the appliance to request the one play list be played by the appliance.

17. The system of claim 15 wherein the controller comprises a display screen to display thumbnail images in the first group and in the second group.

18. The system of claim 17, wherein the controller further comprises a microphone to record an audio annotation associated with one of the thumbnail images, and a text input area to generate text to associate with the one thumbnail image.

19. The system of claim 1, wherein the appliance is operable to play a media object not stored in the controller, and wherein the controller imports the identifier associated with the media object by sending a request to import the identifier not stored in the controller.

20. The system of claim 19, wherein in response to the request to import the identifier not stored in the controller, the appliance sends the identifier and a reduced visual representation of the corresponding media object.

21. The system of claim 20, wherein the reduced visual representation is a thumbnail image of the corresponding media object.

22. The system of claim 19, wherein the request to import the identifier not stored in the controller is sent with payment information.

23. The system of claim 1, wherein the controller is a portable controller capable of wirelessly controlling the appliance over the first network, wherein the first network is a local network and the second network is an external network, and wherein the controller wirelessly controls the appliance to retrieve and play the media object within the appliance.

24. The system of claim 1, wherein the appliance is one in a group comprising a personal computer, a stereo receiver, and a television.

25. The system of claim 24, wherein the controller operates with multiple appliances.

26. The system of claim 1, wherein the media object is one in a group comprising a document, an audio clip and a video clip.

27. A system comprising:

first means for selecting an identifier associated with a media object and to initiate a request to play the media object identified by the identifier, the first means wirelessly transmitting the request having the identifier stored in the first means over a first network, the first network being a wireless network;

second means for receiving the request having the identifier over the wireless network, retrieving the media object using the identifier, and playing the media object; and

third means for storing the media object, wherein the second means retrieves the media object from the third means at certain times, via a second network different than the first network, when the media object is not stored in the second means, wherein the third means for storing the media objects comprises means for synchronizing with the first means to enable the first means to have the identifiers associated with each of the media objects stored in the third means.

28. The system of claim 27, further comprising fourth means coupled to the network, the fourth means for providing the media object when the media object is not in the third means.

29. The system of claim 28, further comprising means for performing access authorization when the media object is retrieved from the fourth means.

30. The system of claim 29, wherein the means for performing access authorization comprises means for encrypting the media object and means for decrypting the media object.

31. The system of claim 27, wherein the first means is operable with one or more second means.

32. The system of claim 27, wherein the first means comprises means for organizing the identifiers using thumbnail image representations of the media objects associated with the identifiers.

33. A method of a network access appliance (NAA), comprising:

wirelessly receiving a request from a portable device over a first network, the request including an identifier for identifying a media object to be played, wherein the media object is not stored within the portable device; in response to the request, determining whether the identified media object is locally stored within the NAA based on the identifier extracted from the request; accessing a first server over a second network to retrieve the media object if the media object is not locally stored within the NAA, the second network being different than the first network; playing the retrieved media object within the NAA; and periodically synchronizing the portable device with the first server to provide the portable device with identifiers for identifying each media object stored on the first server.

34. The method of claim 33, wherein the first network is a local wireless network coupling the portable device to the NAA, and wherein the second network is a wide area network (WAN) coupling the NAA to the first server.

35. The method of claim 33, further comprising: determining whether the first server contains the identified media object; and

accessing a second server over the network to attempt to retrieve the identified media object if the first server does not contain the identified media object.

36. The method of claim 33, wherein the media object is encrypted, wherein the method further comprises:

retrieving a key from the portable device over the first network, wherein the key is stored within the portable device; and

decrypting the media object within the NAA in order to play the media object downloaded from the first server over the second network.

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# **EXHIBIT 14**

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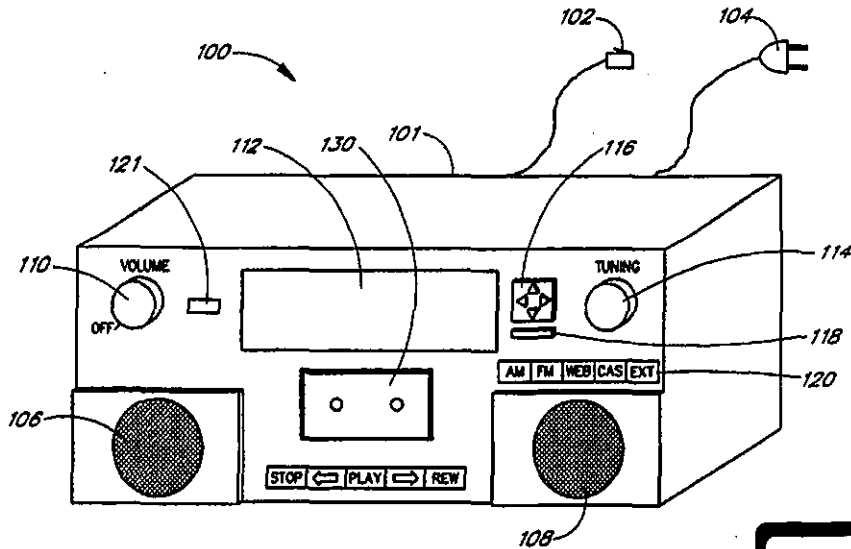
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<p>(21) International Application Number: PCT/US99/01001 (22) International Filing Date: 19 January 1999 (19.01.99) (30) Priority Data: 60/072,127 22 January 1998 (22.01.98) US 09/096,703 12 June 1998 (12.06.98) US (71)(72) Applicants and Inventors: QURESHEY, Safi [US/US]; 15941 Red Hill, Tustin, CA 92780 (US). QURESHEY, Wasi [PK/US]; 15941 Red Hill, Tustin, CA 92780 (US). (74) Agent: ALTMAN, Daniel, E.; Knobbe, Martens, Olson &amp; Bear, 16th floor, 620 Newport Center Drive, Newport Beach, CA 92660-8016 (US).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> <i>With international search report.</i></p>	

(54) Title: INTELLIGENT RADIO

(57) Abstract

An intelligent radio apparatus (100) that is adapted to receive Web radio broadcasts is disclosed. The Web Radio provides a user interface that is less like a computer program and more like a conventional radio, thus making the device easy to use. Rather than the complicated user interface found on Personal computers, the intelligent radio provides familiar radio-type user controls such as switches (120), a tuning knob (114), joysticks (116), voice activated controls, etc. The radio-type user controls allow the user to select a Web radio station and control other aspects of the operation of the intelligent radio (100) in a manner that is more like a conventional radio and less like a computer program. The intelligent radio (100) is configured to run the software needed to access the Internet and thus relieves the user of complicated software installation tasks such as installing and configuring an operating system and installing and configuring Internet access software. The intelligent radio also provides Internet telephony, voicemail, and voice-email capabilities.



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## INTELLIGENT RADIO

### Background of the Invention

#### Field of the Invention

5           The present invention relates to the field of reception of audio programming, and, more particularly, relates to the field of transmission and reception of streaming audio over a computer network such as the Internet.

#### Description of the Related Art

          The Internet is a worldwide array of interconnected computers and information servers that allow anyone with a computer and access to the Internet to get information about virtually any subject 24 hours a day. For the average consumer, an Internet Service  
10   Provider (ISP) provides access to the Internet. ISPs such as CompuServe, Prodigy, and America On-Line, currently link over ten million users to the Internet. Users typically connect to the ISP by using standard telephone lines and a telephone modem. Cable modems that allow a user to connect to the ISP over cable television lines, and satellite connections to the Internet, are also available.

          The Internet provides a wealth of information from stock reports to headline news. One of the newer services provided on the Internet is a streaming audio (e.g., RealAudio and MPEG audio) service. Streaming audio services are often provided in connection with  
15   the World Wide Web (Web) and thus are often called Web radio broadcasts. With streaming audio, a user with a Personal Computer (PC), a sound card, and the necessary software can listen to audio programs from anywhere in the world. For example, Radio Prague provides daily Internet broadcasts from the Czech Republic. Listeners in the U.S. can listen to these Web radio broadcasts either in real time, or stored for later replay. Thus, unlike more traditional radio broadcasts where the listener must be within a reception area, Web radio broadcasts can be heard anywhere, so long as the listener has a connection to the Internet and the necessary computer hardware and  
20   software.

          Unfortunately, even with the ever-decreasing cost of personal computers, the hardware and software needed to listen to a Web radio broadcast is beyond the financial means of many people. Even for those that can afford a personal computer, listening to a Web radio broadcast ties up the computer so that the user cannot use it for other purposes. Moreover, the use of a personal computer to receive streaming audio (e.g., Web radio broadcasts) requires a certain amount of computer literacy on the part of the user. The user  
25   must be able to install the Web Radio software, configure the Web Radio software to communicate with the ISP, and find the various Web radio broadcasts provided on the Web.

#### Summary of the Invention

          Embodiments of the present invention solve these and other problems by providing an intelligent radio apparatus that is adapted to allow a user to receive Web radio broadcasts in a manner similar to the ease and low cost with which a user receives a  
30   regular radio broadcast. Embodiments of the intelligent radio also provide Internet telephony, voicemail, text-to-voice email, voice-to-text email, and voice activated commands. These features are provided in a simple, low-cost, easy-to-use device.

A preferred embodiment of the intelligent radio apparatus relieves the user of the complicated tasks associated with installing and configuring computer software. The intelligent radio apparatus also preferably provides a user interface that is less like a computer program and more like a conventional radio, thus making the device easy to use. In a preferred embodiment, the user controls provided by the intelligent radio are so similar to the controls provided on a conventional AM radio or FM radio that a non-technical user can tune into Web radio broadcasts or AM/FM radio broadcasts with similar ease. When compared to a full-fledged computer, such as a laptop or desktop computer, the intelligent radio typically provides lower cost, smaller size, lower power consumption, less upkeep and maintenance, and more convenience.

Various embodiments of the intelligent radio include user controls such as switches, a tuning knob, joysticks, cursor controls, remote controls, etc. The user controls allow the user to select a Web radio station and control other aspects of the operation of the intelligent radio. In some embodiments, the user controls are configured such that the intelligent radio operates more like a conventional radio and less like a computer program. For example, in one embodiment, the intelligent radio includes a tuning knob that allows the user to "tune" Web radio stations from a list of available Web radio stations. The user turns the tuning knob to move from one Web radio station in a manner similar to the way a user would use the tuning knob on a conventional radio to tune from one radio station to another. The intelligent radio provides each selection of Web radio broadcasts by categories such as, for example, language, content, subject matter, etc.

The intelligent radio apparatus includes a visual display for providing information to a user, a network interface (e.g., a modem) for transmitting and receiving digital data over a communications network, and embedded software adapted to connect to the Web and to decode streaming audio. The communications network may be telephone lines, cable TV lines, satellite communication systems, etc.

In an alternative embodiment, the intelligent radio apparatus also includes loudspeakers for playing the broadcasts. Other embodiments include a data storage device for storing software and audio files.

In other embodiments, the intelligent radio apparatus is adapted to be installed in an automobile, boat, airplane, or other vehicle. In yet another embodiment, the intelligent radio apparatus is adapted to be a portable device much like a conventional transistor radio.

In yet another embodiment, the intelligent radio is configured to work in connection with service routines running on a remote computer connected to a computer network. The remote computer may be an Internet site (e.g., a web site or ISP) that provides additional functionality to the intelligent radio. For example, the intelligent radio may include a microphone to allow voice-activated commands to be used for controlling the intelligent radio. Voice recognition software to interpret the voice commands may be provided in either the intelligent radio or in the remote computer. If the voice recognition software is located in the remote computer, then the intelligent radio digitizes the voice data and passes the digitized voice data to the remote computer. The remote computer converts the voice data into computer commands and passes the command to the intelligent computer. In some embodiments, service routines in the remote computer are used to offload other tasks as well, including, for example, formatting the display, searching the Internet for radio web sites, converting audio and other data from one format to another format, etc. Offloading tasks to the remote computer simplifies

the intelligent radio and reduces the size and cost of the intelligent radio without sacrificing functionality. Moreover, the software in the remote site can be kept up-to-date at all times without updating the software in the intelligent radio.

In yet another embodiment, the intelligent radio is configured to provide Internet telephone services to a user by connecting a telephone or telephone handset to the intelligent radio. An Internet telephone connection, that provides streaming audio, is established  
5 between the intelligent radio and a remote unit such as an intelligent radio, computer, or telephone system. When the user speaks into the handset, the user's voice is digitized and passed to the remote unit where it is converted to audio for the user of the remote unit. Likewise, the remote user's speech is digitized and passes as a stream of digital data to the intelligent radio where it is converted into audio and provided to a loudspeaker in the telephone handset.

#### Brief Description of the Figures

10 The various novel features of the invention are illustrated in the figures listed below and described in the detailed description that follows.

Figure 1 is a perspective view of one embodiment of a tabletop intelligent radio apparatus.

Figure 2 is a block diagram of the functional elements of the intelligent radio apparatus.

Figure 3A shows a default display that appears while a Web broadcast is being received.

15 Figure 3B shows a menu display that allows the user to select one of the command and setup displays shown in Figures 3C-3E.

Figure 3C illustrates a select language display that allows a user to specify desired languages (e.g., English, French, etc.).

Figure 3D illustrates a display that allows a user to select a type of program material (e.g., news, sports, weather, etc.).

Figure 3E illustrates a display that allows a user to select various program broadcasts.

20 Figure 4 illustrates a data-entry display that the intelligent radio apparatus uses to allow the user to input alphanumeric text.

Figure 5 is a flowchart that illustrates operation of the intelligent radio apparatus.

Figure 6A illustrates the information management and data processing functions provided by a Web radio Web site (e.g., [www.webradio.com](http://www.webradio.com)) to produce a list of Web radio broadcast stations for the user.

25 Figure 6B illustrates a relationship between the Web radio Web site and other web sites that provide streaming audio programming.

Figure 7 is a perspective view of a tabletop intelligent radio tuner.

Figure 8 is a block diagram of the functional elements of the intelligent radio tuner shown in Figure 7.

Figure 9 is a block diagram of the functional elements of an embodiment of the intelligent radio that provides a remote  
30 playback capability.

Figure 10 is a block diagram of the functional elements of an embodiment of the intelligent radio that provides a remote access capability.



display. When a station is selected, the stored software program connects to the station and begins to receive digitized audio data transmitted by the station. The intelligent radio converts the received data to analog audio, which is provided to the audio system.

Figure 1 illustrates one embodiment of a tabletop intelligent radio 100. The intelligent radio 100 is mounted in an enclosure 101 and connects to household AC power through a power cord 104 and to a communications network by a network cable 102. The network cable 102 may be a telephone line, a network cable, a cable TV cable, a connection to a wireless (e.g., satellite) unit, etc. For example, the communications network may use Iridium satellites developed by the Motorola Corp., Globalstar satellites developed by a consortium of European manufacturers which includes Aérospatiale and Alcatel, P21 satellites developed on a project financed by Inmarsat, or the Odyssey satellite system developed by a TRW consortium associated with Teleglobe/Canada.

User controls are mounted on the front of the enclosure 101 and include a combined on-off and volume control 110, a command button 121, a cursor control 116, a select button 118, a tuning control 114, and a button bar 120. The cursor control 116 provides up, down, left, and right movements of a cursor or other entity on a display device 112. The button bar 120 provides buttons to select an audio source, including, for example, "AM" radio, "FM" radio, "Web" radio, "Cassette", and "External" input. Also mounted on the front of the enclosure 101 is the display device 112, which provides information to the user. An optional cassette player/recorder 130 provides the capability to play and record audio cassettes. The intelligent radio 100 also includes a left stereo speaker 106 and a right stereo speaker 108 that may be mounted in the enclosure 101 or in separate enclosures. A wireless remote 135 provides remote operation of the intelligent radio 100. In some embodiments, a microphone is provided as well. An output from the microphone is provided to an analog-to-digital converter to convert the analog microphone signal into digital data. The microphone may be placed in the intelligent radio 100, in the wireless remote 135, or both.

Figure 2 is a block diagram of the functional elements of the intelligent radio 100. The intelligent radio 100 comprises a Central Processor Unit (CPU) 202 that is used to run the intelligent radio software. The CPU 202 is connected to a random access memory 204, a data storage device 210, and a modem 206. The data storage device 210 may be any type of non-volatile data storage device, including, for example, a floppy disk drive, a hard disk drive, a flash memory, a CD-ROM, a DVD-ROM, a CMOS memory with battery backup, etc. The data storage device 210 provides storage for software programs used by the intelligent radio 100. The software stored on the data storage device 210 may be upgraded by downloading new software from the Web. The data storage device 210 may also provide storage for digitized audio material, such as recorded Web radio broadcasts, CD-Audio, etc. The modem 206 is connected to a communications network 230, shown as a Public Switched Telephone Network (PSTN), by the network cable 102. Although the communications network 230 is shown as a PSTN network, one skilled in the art will recognize that the network 230 may also be a cable television (CATV) network, a satellite network, or any other communications network. In one embodiment, the network 230 comprises both a Direct TV/PC satellite connection that provides information to the intelligent radio 100 at high speed (e.g., 400,000 bytes per second or more), and a PSTN network connection so the intelligent radio can upload information back to the ISP 232 (because many Direct TV/PC connections are only one-way). In yet another embodiment, the satellite network is a two-way satellite

network that uses the satellite for both download and upload. In one embodiment, the satellite network uses the Iridium™ system developed, in part, by the Motorola Corp.

Optionally, a telephone 229 is connected to a first port of a codec 260. A second port of the codec 260 is provided to the CPU 202. The codec provides digital-to-analog conversion and analog-to-digital conversion for the telephone 229. The codec 260 also provides standard telephone interface signals, such as a ringing signal, to the telephone 229, and telephone status conditions, such as receiver up or receiver down, to the CPU 202. In some embodiments, the codec 260 and the modem 206 may be combined as a telephone modem. The telephone 229 may be connected even when the network 230 is not a telephone network.

The modem 206 provides an interface between the CPU 202 and the communications network 230 and the operational characteristics of the modem 206 are determined by the type of communications network 230. Thus, if the network 230 is a PSTN network, then a telephone modem is used; if the network 230 is a CATV network, then a cable modem is used, etc. In a preferred embodiment, the modem 206 is integral to the intelligent radio 100. In other embodiments, the modem 206 is provided in a separate enclosure. An Internet Service Provider (ISP) 232 provides the user with a connection from the communications network 230 to the Web via the Internet 234. Note that Figure 2 shows functional elements, but not necessarily hardware configurations. Thus, for example, the modem 206 may be implemented in software on the CPU 202. The CPU 202 may be a Digital Signal Processor (DSP). The CPU 202 may comprise a single computer processor, or multiple computer processors. In one embodiment, the CPU 202 comprises two processors, a DSP and a general purpose microprocessor. In one embodiment, the modem 206 is provided in a plug-in module such that the intelligent radio can be configured for different types of computer networks by simply changing the modem plug-in to suit the type of network being used.

The CPU 202 provides data to the display device 112. The CPU 202 receives user inputs from the command button 121, the tuning control 114, the button bar 120, the select button 118, and the cursor control 116. The CPU 202 provides digitized audio samples to an input of a Digital-to-Analog Converter (DAC) 220. The analog audio output of the DAC 220 is provided to an amplifier 222. In a preferred embodiment, the DAC 220 and the amplifier 222 are each two-channel devices, providing left and right stereo channels. A left channel output of the amplifier 222 is provided to the left channel speaker 106 and a right channel output of the amplifier 222 is provided to the right channel speaker 108. The volume control 110 controls the gain of the amplifier 222.

As shown in the preferred embodiment in Figure 2, the other optional audio sources such as the cassette device 130, an AM tuner 240, an FM tuner 242, and an external input 244 also provide inputs to the amplifier 222. Other optional audio sources may be provided, such as, for example, an audio CD, a DVD, a digital audio tape unit, etc. The CPU 202 controls the cassette device 130, the AM tuner 240, the FM tuner 242, and other optional audio sources. A line output from the amplifier 222 may also be provided to a record input of the cassette device 130.

As described above, the button bar 120 is used to select one of the audio sources. When the button bar 120 is set to "AM," the intelligent radio 100 operates in an AM radio mode. In the AM radio mode, an analog output from the AM tuner 240 is provided to

the amplifier 222. Also in the AM radio mode, the display device 112 displays the frequency of an AM station selected by the AM tuner 240. The user may use the tuning control 114 to select a desired AM station. The AM mode is optional.

An analog output from a microphone 250 is provided to an analog input of an analog-to-digital converter 252. A digital output from the analog-to-digital converter 252 is provided to the CPU 202. The microphone 250 and converter 252 allow for voice commands to control the intelligent radio. The microphone 250 and converter 252 are optional. In some embodiments, a microphone is also placed in a wireless remote so that voice commands can be provided from the wireless remote.

When the button bar 120 is set to "FM," the intelligent radio 100 operates in an FM radio mode. In the FM radio mode, the analog audio output from the FM tuner is provided to the amplifier 222, and the display device 112 displays the frequency of the FM station selected by the FM tuner 242. The FM mode is also optional.

When the button bar 120 is set to "Cassette," the intelligent radio 100 operates in a cassette playback mode. In the cassette playback mode, analog output from the cassette player is provided to the amplifier 222, and the display device 112 displays information relating to the cassette playback. The cassette playback mode is also optional. The cassette device 130 may also optionally be configured to provide a record capability such that the cassette can be used to record audio information from any of the other modes. Thus, for example, the cassette can be used to record FM radio, AM radio, or Web radio broadcasts.

When the button bar 120 is set to "Web," the intelligent radio 100 operates in a Web Radio mode. In the Web Radio mode, the intelligent radio 100 uses the modem 206 to connect to the ISP 232. The ISP 232 provides a list of available Web broadcasts, and access to the Internet 234, so that the various Web broadcasts can be received by the intelligent radio 100. In the Web Radio mode, the display device 112 is used to select a Web broadcast and to provide information about the selected Web broadcast.

Figures 3A through 3E show various displays provided by the display device 112 while in the Web Radio mode. Figure 3A shows a default display 300 that appears while a Web broadcast is being received. Figure 3B shows a menu display that allows the user to select one of the command and setup displays shown in Figures 3C-3E.

The display 300, shown in Figure 3A, includes information about the Web broadcast including the type of broadcast (e.g., "Newscast"), the Web address (URL) of the source for the broadcast (e.g., <http://www/npr.org>), a description of the broadcast (e.g., "National Public Radio 1997"), a broadcast format (e.g., "Streaming RealAudio"), etc.

Figure 3B shows a menu display 320 that allows the user to access the various setup and control displays shown in Figures 3D-3E. The user activates the menu display 320 by pressing the command button 121. The display 320 provides a menu list 322 that lists the various other command displays. The list 322 may provide: a "Tune Station" command for activating a tune-station display 340, shown in Figure 3E; a "Select Language" command for activating a select-language display 310, shown in Figure 3C; and a "Select List" command for activating a select-list display 322, shown in Figure 3D. The list 322 may also provide commands to activate other displays (not shown) such as "Setup," to initialize the intelligent radio, "Scan Stations," to get a new list of Web broadcast stations from the ISP 232, and "Define Station," to manually define a Web broadcast station not listed by the ISP 232. The list 322 may also provide

commands to activate other displays such as "Set Clock," and "Set Alarm," to provide optional clock and alarm clock modes for the display device 112.

The display 320 also provides a scroll bar 321 to allow the user to scroll through the list 322 and select an item (command) from the list. Scrolling may be accomplished by using either the cursor control 116 or the tuning control 114. The user uses the cursor control 116 or the tuning control 114 to highlight a desired menu item in the list 322, and then the user presses the select button 118 to select the highlighted menu item.

The select-language display 310, shown in Figure 3B, allows the user to elect to receive Web broadcasts in one or more selected languages. The display 310 provides a list of available languages 312 and a scroll bar 314 for scrolling through the list 312. Each item in the list 312 corresponds to a language (e.g., English, French, etc.) and each item is provided with a checkbox 313. If a checkbox 313 is checked, then the corresponding language is enabled. The display 310 also provides an OK button 315, a Cancel button 316, a Clear-All button 317, and a Select-All button 318. The Clear-All button 317 clears all of the checkboxes 313, and the Select-All button 318 checks all of the checkboxes 313. The user "presses" one of the buttons 315-318 by using the cursor control 116 to highlight a desired button and then pressing the select button 118 to "press" the highlighted button.

The select-list display 330, shown in Figure 3D, allows the user to select a preferred type of program material (e.g., Sports, Weather, News, All, etc.). The display 330 includes a list 332 of program types and a scroll bar 331. The user uses the cursor control 116 or the tuning control 114 to highlight a desired program type from the list 332, and then the user presses the select button 118 to select the highlighted program type.

The select-broadcast display 340, shown in Figure 3E, allows the user to select a Web broadcast. The display 340 includes a list 342 of the available Web broadcasts having the proper language (as selected in the select language display 310) and the desired program type (as selected in the select-list display 331). The user uses the cursor control 116 or the tuning control 114 to highlight a desired broadcast from the list 342, and then the user presses the select button 118 to select the highlighted program type. Each item in the list 342 is provided with a checkbox 343. If the checkbox 343 is checked, then the corresponding broadcast is a preferred (or "fast-tune") broadcast. The user may scroll through the fast-tune broadcasts by using the tuning control 114 from the default display 300 shown in Figure 3A, without having to activate the select-broadcast display 340. This provides a convenient shortcut feature to allow the user to quickly tune to stations that the user regularly listens to.

Figure 4 illustrates a data-entry display 450 that allows the user to input alphanumeric text (e.g., the telephone number of the ISP 232 or a URL). The display 450 includes a text prompt 451 to prompt the user for the desired data. The display also includes an on-screen keyboard 452, a text display 453, an OK button 454 and a Cancel button 455. The user enters text by using the cursor control 118 to highlight a desired character on the on-screen keyboard 452 and then pressing the select button 118 to enter the highlighted character into the text display 453. The OK button 454 and the Cancel button 455 are "pressed" in the same fashion.

Figure 5 is a flowchart 500 that begins at a start block 501 and illustrates the Web Radio mode process. The process advances from the start block 501 to a decision block 502, where the process checks a status flag to determine whether or not the



intelligent radio software needs to be initialized (setup). If setup is needed, then the process advances to a process block 504; otherwise, the process jumps over the setup steps to a process block 514. In the process block 504, the process obtains a phone number for the desired ISP 232. The phone number may be obtained from a default phone number stored in the intelligent radio software, or by prompting the user through the data-entry display 450. Once the phone number has been obtained, the process advances to a process  
5 block 506, where the modem 206 dials the telephone number and establishes a modem connection with the ISP 232. Once the connection is established, the process advances to a process block 508 where the user establishes an account with the ISP 232.

In one embodiment, the user is prompted for a password that is stored on the data storage device 210 or entered using the data-entry display 450. Establishing an account may include other actions, such as creating a username for the user, changing the phone number used to access the ISP 232, and entering information about the user and the user's account. Once an account is established, the  
10 process advances to a process block 510 where a list of available Web radio broadcast stations is downloaded to the intelligent radio 100 from the ISP 232 and stored on the storage device 210. Lists of available languages and program types are also downloaded and stored on the storage device 210. Once the lists are downloaded, the process advances to a hang-up block 512 wherein the modem 206 terminates the network connection (e.g., hangs-up the phone). Upon hang-up, the setup process is complete, and the process advances to the process block 514.

In the process block 514, the modem dials the ISP 232 and then advances to a process block 516 where the intelligent radio  
15 100 logs on to the user's account at the ISP 232. The hang-up, redial, and logon (blocks 512, 514, and 516, respectively) is desirable when using a PSTN, because the initial telephone call, placed in the block 506, is typically a long-distance call or a toll-free (e.g., a 1-800) call. By contrast, the telephone call placed in the block 514 is typically a local call. When using a non-PSTN network (e.g., a cable modem, a satellite network, etc.) then the hang-up, redial, and logon (blocks 512, 514, and 516, respectively) is typically omitted.

Once the user is logged on, the process advances to a process block 518 where the user selects (tunes) a Web radio broadcast  
20 station. Once a Web broadcast has been selected, the process advances to a process block 520 where the intelligent radio 100 receives the Web broadcast. The CPU 202 decodes and decompresses the received data as necessary and then sends the decompressed data to the DAC 220 where it is converted to an analog signal that is subsequently played on the speakers 106, 108. The process remains in the process block 520 while the user listens to the Web broadcast.

If the user tunes to a new Web broadcast station (e.g., by turning the tuning control 114 or by activating the select-broadcast  
25 display 340) then the process loops back to the process block 518, selects the new station, and returns to the process block 520.

Figure 6A illustrates the information management and data processing functions 600 provided by a Web Radio site 602 (e.g.,  
www.webradio.com). Access to the Internet site 602 is made possible by the Internet access provided by the ISP 232. The Internet  
30 site 602 provides a list of Web radio broadcast stations for the user and optionally other value-added services that enhance the operation of the intelligent radio 100. For example, the Internet site 602 may provide a list of available program sources and streaming audio programming. The site 602 may also maintain user profile comprising a list of preferred Internet "broadcast stations". The site 602 also provides special download capabilities such that the user can download information and software into the intelligent radio. The site 602

also provides upload capabilities such that the user can upload information, such as preferences, etc., from the intelligent radio 100 to the site 602. For example, the site 602 can provide a customized list of stations for each user and voicemail capability. The site 602 may provide reformatting of streaming audio data into a format better suited for the intelligent radio.

5 In one embodiment, the site 602 also provides Web telephone capabilities to the intelligent radio 100, such that the user can use the intelligent radio as a telephone to talk to other users that are connected to the Internet. In one embodiment of the Web telephone, the codec 260 is used to digitize speech from a microphone in the handset of the telephone 229. The digitized speech is sent over the network 230 to the ISP. The ISP forwards the digitized speech to a remote user. Similarly, the ISP provides digitized speech from the remote user to the intelligent radio. The intelligent radio uses the codec 260 to convert the digitized speech into analog signals that are played on the speakers 106 and 108 or a speaker in the handset of the telephone 229.

10 In yet another embodiment, the intelligent radio provides voice email in connection with the site 602. To receive email, text-to-voice software in the site 602 is used to convert email text into digitized voice data as words spoken in the user's desired language. The digitized voice data is provided to the intelligent radio where it is converted to an analog signal and played on the speakers 106 and 108 or a speaker in the handset of the telephone 229. To receive email, the user speaks into the microphone 250 or the microphone in the handset of the telephone 229 and the spoken words are converted into digitized speech by the intelligent radio. The intelligent radio  
15 sends the digitized speech to the site 602 where it is converted into email text and then emailed to the recipient. The software to convert speech to text and text to speech is provided in the site 602 in order to minimize the cost and complexity of the intelligent radio. Alternatively, the software to convert speech to text and text to speech is provided in the intelligent radio.

In one embodiment, the site 602 also provides special formatting and markup protocols that are tailored to the intelligent radio display 112. Most existing Internet sites are geared towards a computer or television and assume that a user has a large, high  
20 resolution, color monitor. Most existing Internet sites also assume that a user is accessing the site by using a Web browser such as Netscape Navigator™ or Microsoft Internet Explorer™. These browsers support high level protocols such as HyperText Markup Language (HTML). The display 112, may be relatively smaller, and relatively less capable than a traditional computer monitor. In some embodiments, the display 112 does not necessarily need all of the capabilities and complexity of HTML and is thus better served by information that is formatted for the display 112 and that is expressed in a markup language that is suited to the needs of the intelligent  
25 radio 100, without the overhead and complexity of HTML.

When the user connects to the Internet site, information is passed along a first data stream to an account management block 604. The block 604 provides account management functions relating to the user's account with the ISP 232. The account management block passes data to a user preference block 606, which retrieves user profile information and user preferences specified by the user. Information regarding the user preferences may be stored by the ISP 232, or downloaded from the intelligent radio 100 as  
30 needed.

Information is also passed from the process block 602 along a second data stream to a program management block 608. The program management block 608 accesses a language variety database 610 to determine which languages are available, and a program

variety database 612 to determine which types of programs are available. The program management block 608 also accesses program sources such as live broadcasts 620, archived broadcasts 624, stored music 626, and other streaming audio sources 622.

User profile information from the user preference block 606 and program data from the program management block 608 are provided to a program list block 616, which constructs a list of available Web programs (broadcasts) that fit the user's preferences. The list constructed in the block 616 is passed to the intelligent radio 100.

Figure 6B shows the conceptual relationship between the site 602 and other Web sites that supply streaming audio information, such as a site 630, a site 631, and a site 632. The Internet provides the ability to transfer data between any two of the sites 602, 630-632. The user connects, through the ISP 232, to the site 602. The site 602 provides links to the sites 630-632 through the programming lists provided by the site 602. If the user selects a streaming audio program from one of the sites 630-632, then the site 602 provides the necessary link to the selected site. In some embodiments, the site 602 provides the link information to the intelligent radio 100, and the intelligent radio 100 makes a "direct" connection to the selected site. In other embodiments, the site 602 links to the selected site, receives the streaming audio data, reformats the data if desired, and then sends the streaming audio data to the intelligent radio 100.

Figure 7 illustrates an embodiment of an intelligent radio tuner 700. The tuner 700 is mounted in an enclosure 701 and connects to household AC power through a power cord 104, to a network through a network cable 102, and to an audio system through an audio line 702. User controls are mounted on the front of the enclosure 701 and include an on-off switch 704, a command button 121, a cursor control 116, a select button 118, and a tuning control 114. The cursor control 116 provides up, down, left, and right movements of a cursor or other entity on a display device 112. Also mounted on the front of the enclosure 701 is the display device 112, which provides information to the user.

Figure 8 is a block diagram of the functional elements of the intelligent radio configured as a tuner 700. The tuner 700 comprises the Central Processor Unit (CPU) 202 that is used to run the intelligent radio software. The CPU 202 is connected to the random access memory 204, the data storage device 210, the modem 206, and the codec 260. The data storage device 210 may be any type of non-volatile data storage device, including, for example, a floppy disk drive, a hard disk drive, a flash memory, a CD-ROM, a DVD-ROM, a CMOS memory with battery backup, etc. The modem 206 is connected to a communications network 230, shown as a Public Switched Telephone Network (PSTN). Although the communications network 230 is shown as a PSTN network, one skilled in the art will recognize that the network 230 may also be a cable television (CATV) network, a satellite network, or any other communications network. The modem 206 provides an interface between the CPU 202 and the communications network 230 and the operational characteristics of the modem 206 are determined by the type of communications network 203. Thus, if the network 230 is a PSTN network, then a telephone modem is used; and if the network 230 is a CATV network, then a cable modem is used, etc. An Internet Service Provider (ISP) 232 provides the user with a connection from the network 230 to the Web via the Internet 234.

The CPU 202 provides data to the display device 112. The CPU 202 receives user inputs from the command button 121, the tuning control 114, the select button 118, and the cursor control 116. The CPU 202 provides digitized audio samples to an input of a

Digital-to-Analog Converter (DAC) 220. The analog audio output of the DAC 220 is provided to the audio output 702. In a preferred embodiment, the DAC 220 is a two-channel device, providing left and right stereo channels.

Figure 9 is a block diagram of the functional elements of an embodiment of an intelligent radio that provides for remote playback. Figure 9 shows a base unit 900 that is connected to the communications network 230. The base unit 900 receives streaming audio from the Web and transmits the audio information to a remote playback unit 902.

The base unit 900 is similar in most respects to the intelligent radio except that the amplifier 222, the loudspeakers 106 and 108, and the volume control 110 are not located in the base unit 900, but rather are located in the remote playback unit 902. In the base unit, the DAC 220, the cassette device 130, the AM tuner 240, the FM tuner 242, and the external input 244 are connected to a transmitter 904 rather than the amplifier 222. The transmitter 904 provides a transmitted signal to a receiver 906 in the remote unit 902. The receiver 906 provides an audio output to the amplifier 222.

The base unit 900 receives the streaming audio information from the Internet 234 and uses a transmission carrier to retransmit the audio information to one or more remote units 902. The transmitter 904 and the receiver 906 may use any form of communication for the transmission carrier, including radio frequency communication, infrared communication, ultrasonic communication, etc. In one embodiment, the transmitter 904 may be a low power FM (Frequency Modulation) transmitter compatible with standard FM broadcast bands, such that the remote playback unit 902 can be a standard FM transistor radio or a stereo receiver. In yet another embodiment, the transmitter 904 may be a low power AM (Amplitude Modulation) transmitter compatible with standard AM broadcast bands, such that the remote playback unit 902 can be a standard AM transistor radio or a stereo receiver.

In other embodiments, the base unit 900 may also include an amplifier 222, loudspeakers 106 and 108, and a volume control 110 such that the base unit 900 can provide both playback of the audio information and transmission of the audio information to the remote unit 902.

Figure 10 is a block diagram of the functional elements of an embodiment of an intelligent radio that provides for remote access, comprising a base unit 1002 and an intelligent radio 1000. The base unit 1002 comprises a transceiver 1012 coupled to a modem 1011. The modem 1011 is connected to the communications network 230. The modem 1011 receives data from the ISP and provides the data to the transceiver 1012, which then transmits the data to a transceiver 1010 in the intelligent radio 1000. The transceiver 1010 transmits data from the intelligent radio 1000 to the transceiver 1012. The transceiver 1012 provides the data from the intelligent radio 1000 to the modem 1011, which sends the data to the ISP 232.

The intelligent radio 1000 is similar in most respects to the intelligent radio 100 shown in Figure 2, with the addition of the transceiver 1010. A data input/output port of the transceiver 1010 is provided to the processor 202 and a Radio Frequency (RF) input/output port of the transceiver 1010 is provided to an antenna. Also, in the intelligent radio 1000, the modem 208 is optional (because network communications are handled by the transceiver 1010 rather than the modem 206).

The transceivers 1010 and 1012 use any suitable means for communication, including, for example, optical communication, radio communication, etc. In a preferred embodiment, the transceivers 1010 and 1012 are radio transceivers that use spread-spectrum

communication techniques at a frequency of approximately 2.4 GHz. The combination of the base unit 1002 and the intelligent radio 1000 provides a capability similar to that provided by a cordless telephone. The base unit 1002 can be located near a network connection point (e.g., a telephone outlet), and the intelligent radio 1000 can be conveniently placed anywhere within the range of the base unit 1002. The two-way communication link between the transceiver 1010 and the transceiver 1012 provides a cordless  
5 connection to the network 230.

Other Embodiments

While the above description contains many specifics, these should not be construed as limitations on the scope of the invention, but rather as an exemplification of preferred embodiments thereof. The various user controls and buttons can be relocated, combined, reconfigured, etc. Most of the user controls and buttons can even be omitted entirely in favor of voice-activated commands.  
10 One skilled in the art will recognize that many of the various features, and capabilities described in connection with the intelligent radio 100, are also applicable to other embodiments as well, including the embodiments described in connection with Figures 7-10. One skilled in the art will also recognize that other embodiments are contemplated, including, for example, handheld intelligent radios, and intelligent radios for boats, cars, trucks, planes, and other vehicles, etc.

One skilled in the art will recognize that these features, and thus the scope of the present invention, should be interpreted in  
15 light of the following claims and any equivalents thereto.

WHAT IS CLAIMED IS:

1. A radio for receiving, with substantially equal convenience, broadcasts from both local radio stations and from the world wide web, comprising:
- a visual display for providing information to a user;
  - 5 tuner circuitry for receiving radio frequency signals from radio broadcast stations;
  - one or more audio amplifiers;
  - one or more loudspeakers operably connected to said audio amplifiers;
  - a modem for transmitting and receiving digital data over a communications network;
  - a data storage device; and
  - 10 a software program stored on said data storage device, said software program configured to use said modem to connect to an Internet service provider to receive digitized audio broadcasts from said Internet service provider, said program further configured to provide a select broadcast display to allow the user to selectably connect a program broadcast to the input of said one or more audio amplifiers either from a local AM or FM radio station or from the world wide Web so that to the user, reception of a broadcast from the world wide Web is no more complicated than listening to a local FM or AM radio
  - 15 station.
2. A method for providing, with substantially equal convenience, access to audio broadcasts over the world wide Web and access to broadcasts from local radio stations, comprising the steps of:
- using a modem for transmitting and receiving digital data over a communications network to an Internet service
  - 20 provider;
  - using a radio tuner to receive audio broadcasts from local radio stations; and
  - providing a stored software program for allowing selection of a Web broadcast with substantially the same controls and convenience as selecting a local radio broadcast.
3. The method of Claim 2, wherein said local radio stations are FM broadcast radio stations.
4. The method of Claim 2, wherein said local radio stations are AM broadcast radio stations.
- 25 5. A self-contained intelligent radio for receiving audio broadcasts over the world wide Web, comprising:
- a visual display for providing information to a user;
  - a modem for transmitting and receiving digital data over a communications network;
  - a data storage device;
  - one or more loudspeakers; and
  - 30 a software program stored on said data storage device, said software program configured to use said modem to connect to an Internet service provider, receive digitized audio broadcasts from said Internet service provider, and play said audio broadcasts on said speakers, said software further configured to provide: a menu display that allows the user to select a

command; a select language display that allows the user to specify a desired language; a program material display to allow the user to select a type of program material; and a select broadcast display to allow the user to select a program broadcast.

6. A self-contained intelligent radio for receiving audio broadcasts over the world wide Web, comprising:  
a visual display for providing information to a user;  
5 a network interface for transmitting and receiving digital data over a communications network;  
a data storage device; and  
a software program stored on said data storage device, said software program configured to use said network interface to connect to an Internet service provider, and receive digitized audio broadcasts from said Internet service provider.
7. The self-contained intelligent radio of Claim 6, wherein said software program is upgraded by downloading data over  
10 said communications network.
8. The self-contained intelligent radio of Claim 6, further comprising one or more loudspeakers.
9. The self-contained intelligent radio of Claim 6, wherein said communications network is a telephone network.
10. The self-contained intelligent radio of Claim 6, wherein said communications network is a satellite network.
11. The self-contained intelligent radio of Claim 6, wherein said communications network is a cable television network.
- 15 12. The self-contained intelligent radio of Claim 6, further comprising a transmitter configured to transmit audio information using a transmission carrier.
13. The self-contained intelligent radio of Claim 12, wherein said transmission carrier is a radio frequency carrier.
14. The self-contained intelligent radio of Claim 12, wherein said transmission carrier is an infrared carrier.
15. The self-contained intelligent radio of Claim 12, wherein said transmission carrier is a spread-spectrum carrier.
- 20 16. The self-contained intelligent radio of Claim 12, further comprising a receiver for receiving audio information transmitted by said intelligent radio.
17. The self-contained intelligent radio of Claim 6, wherein said software is configured to provide a menu display that allows the user to select a command.
18. The self-contained intelligent radio of Claim 6, wherein said software is configured to provide a select language  
25 display that allows the user to specify a desired language.
19. The self-contained intelligent radio of Claim 6, wherein said software is configured to provide a program material display to allow the user to select a type of program material.
20. The self-contained intelligent radio of Claim 6, wherein said software is configured to provide a select broadcast display to allow the user to select a program broadcast.
- 30 21. The self-contained intelligent radio of Claim 6, wherein said software is configured to provide a data-entry display to allow the user to input alpha-numeric text.
22. The self-contained intelligent radio of Claim 6, wherein said software is provided as firmware.

23. The self-contained intelligent radio of Claim 22, wherein said software is stored in non-volatile semiconductor memory.
24. The self-contained intelligent radio of Claim 6, further comprising a display and a plurality of user controls.
25. The self-contained intelligent radio of Claim 24, wherein said user controls include at least one tuning knob, said tuning knob configured to select a Web radio broadcast.
26. The self-contained intelligent radio of Claim 24, wherein said user controls are configured to allow the user to operate the intelligent radio in a manner that is similar to the operation of a conventional radio.
27. The self-contained intelligent radio of Claim 24, wherein said display and one or more of said user controls are mounted on a front panel of said intelligent radio.
28. The self-contained intelligent radio of Claim 6, wherein said network interface comprises a telephone modem.
29. The self-contained intelligent radio of Claim 6, wherein said network interface comprises a cable modem.
30. The self-contained intelligent radio of Claim 6, wherein said network interface comprises a satellite modem.
31. The self-contained intelligent radio of Claim 6, wherein said network interface comprises a transceiver.
32. The self-contained intelligent radio of Claim 31, wherein said transceiver comprises a spread-spectrum transceiver.
33. The self-contained intelligent radio of Claim 6, further comprising a voicemodem.
34. The self-contained intelligent radio of Claim 33, wherein said intelligent radio is configured to provide an Internet telephone mode.
35. An intelligent radio apparatus comprising:  
a processor operatively coupled to a computer network; and  
software loaded into a memory operatively coupled to said processor, software configured to:  
provide a list of streaming audio programs for an intelligent radio;  
provide access to said streaming audio programs; and  
provide information formatted for a display in said intelligent radio.
36. The apparatus of Claim 35, said software further configured to provide Internet telephone service to said intelligent radio.
37. The apparatus of Claim 35, said software further configured to provide voicemail to said intelligent radio.
38. The apparatus of Claim 35, wherein said list of streaming audio programs comprises a customized list.
39. The apparatus of Claim 35, wherein said display has a display area less than twenty-five square inches.
40. The apparatus of Claim 35, said software further configured to download software modules into a memory in said intelligent radio.
41. The apparatus of Claim 35, wherein said processor is a digital signal processor.



42. The apparatus of Claim 35, wherein said software is further configured to communicate with service routines running on a computer connected to said computer network.
43. The apparatus of Claim 43, wherein said service routines provide added functionality to said software.
44. The apparatus of Claim 44, wherein said added functionality comprises voice command recognition.
- 5 45. The apparatus of Claim 45, wherein said added functionality comprises data conversion.
46. The apparatus of Claim 45, wherein said added functionality comprises the ability to convert text messages into voice messages.
47. The apparatus of Claim 45, wherein said added functionality comprises the ability to convert voice messages into text messages.
- 10 48. The apparatus of Claim 45, wherein said added functionality comprises formatting a display screen.
49. The apparatus of Claim 35, wherein said software is further configured to provide voice-activated commands.

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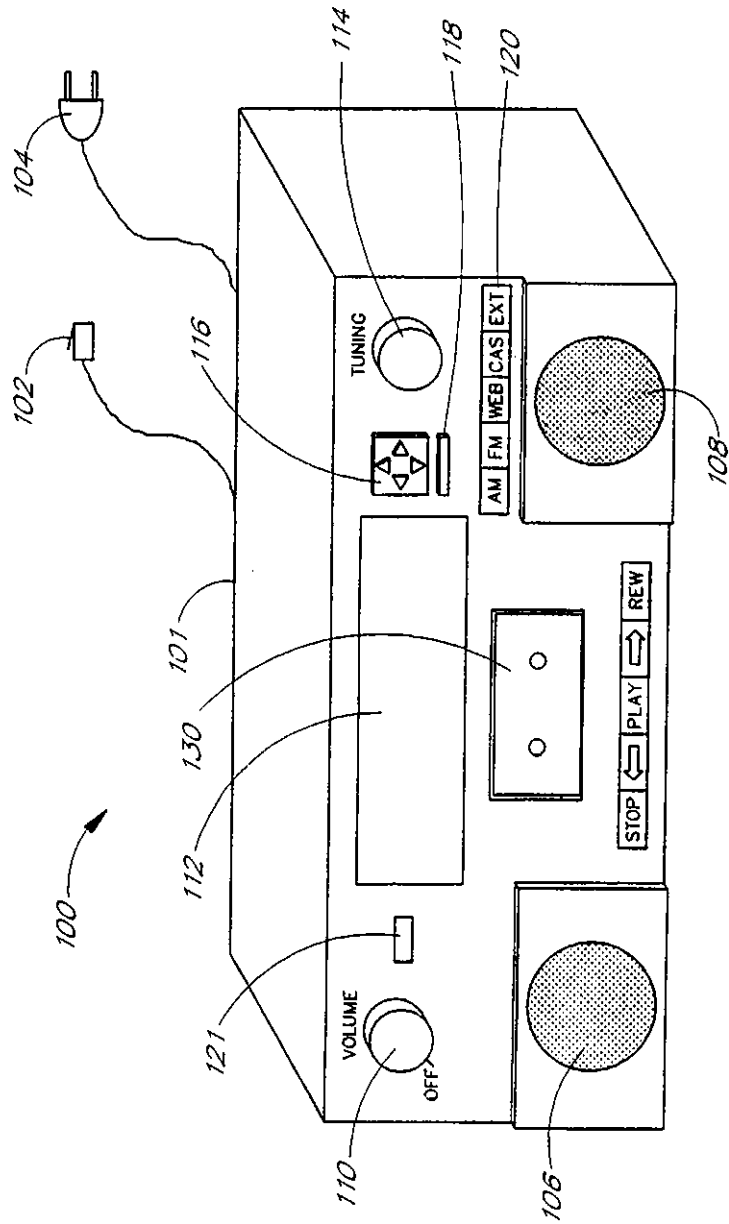


FIG. 1

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100

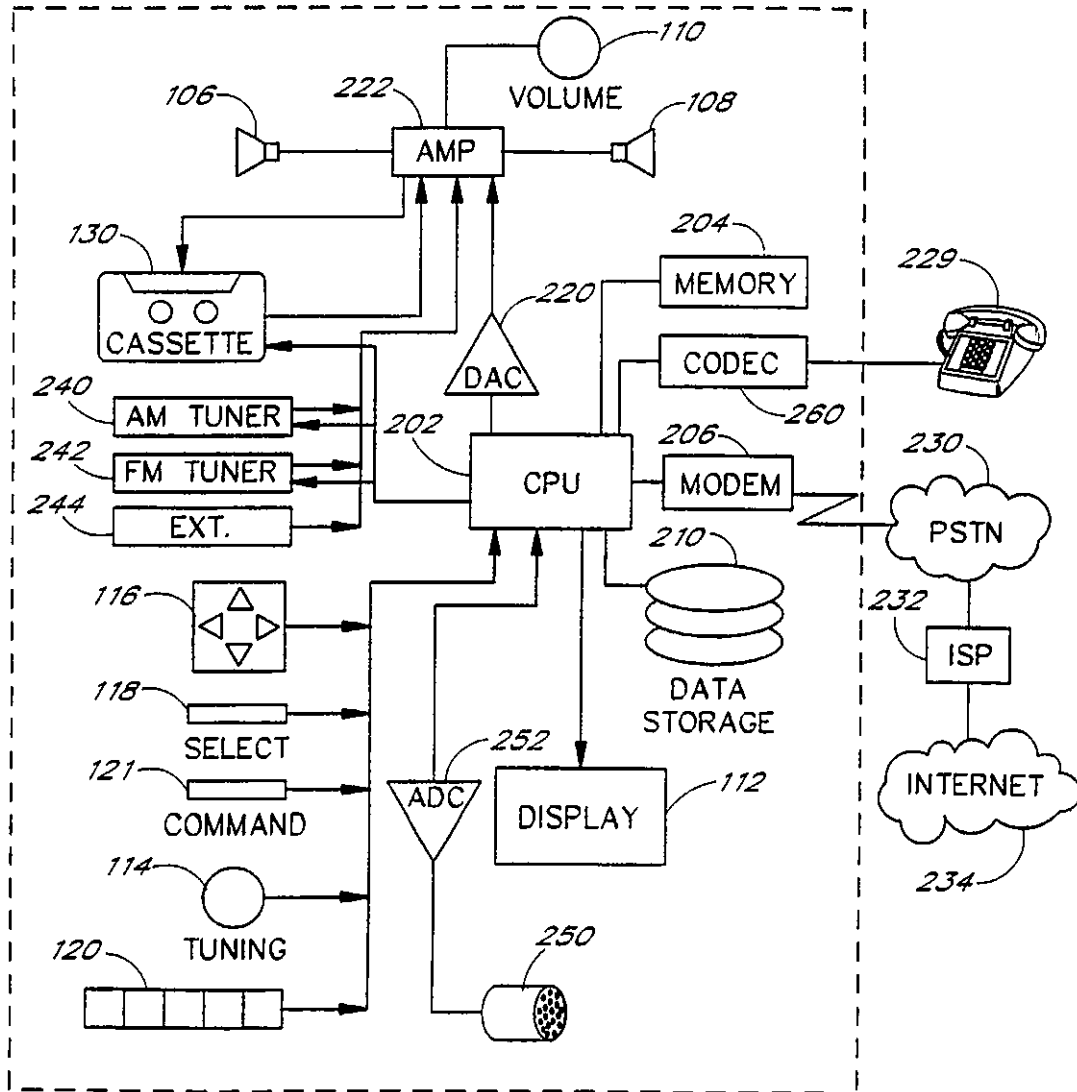


FIG. 2

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300

Clip	pnm://audio.npr.org/news.auto.ra
11:01 Newscast - 17-August-1997	
http://www.npr.org/ National Public Radio 1997	
Status: Streaming RealAudio from audio.npr.org...	
Pre-recorded Net Bandwidth: 96% Ch. Rate 8000bps	

FIG. 3A

A rectangular menu box containing a list of options: TUNE STATION, SET CLOCK, SET ALARM, SCAN STATIONS, SELECT LANGUAGES, and DEFINE STATION. A vertical scrollbar is on the right side. A horizontal bar highlights the 'SELECT LANGUAGES' option. Labels 320, 321, 322, and 323 point to the menu box, the scrollbar, the highlighted option, and the menu text respectively.

FIG. 3B

A dialog box titled 'LANGUAGES'. On the left, there are three checkboxes: 'ENGLISH' (checked), 'FRENCH', and 'GERMAN'. A vertical scrollbar is between the checkboxes and the buttons. On the right, there are four buttons: 'OK', 'CANCEL', 'CLEAR ALL', and 'SELECT ALL'. Labels 310, 312, 313, 314, 315, 316, 317, and 318 point to the dialog box, the list area, the 'ENGLISH' checkbox, the scrollbar, the 'OK' button, the 'CANCEL' button, the 'CLEAR ALL' button, and the 'SELECT ALL' button respectively.

FIG. 3C

FIG. 3D

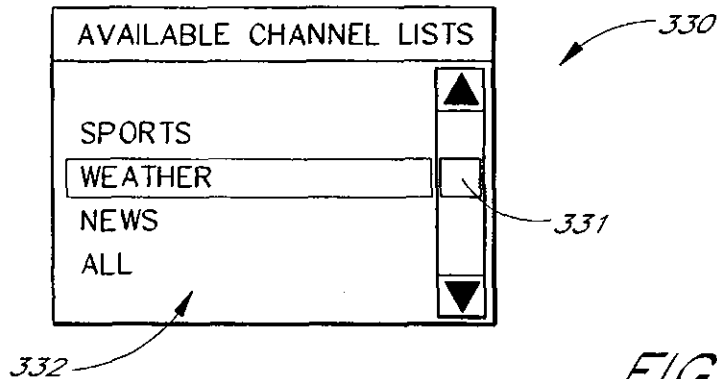


FIG. 3E

ID	Description	Address
<input type="checkbox"/> ABC	ABC Hourly News	<a href="http://www.rbn.com/clg-bin/r.pl?swave/abc/wnews.ra">http://www.rbn.com/clg-bin/r.pl?swave/abc/wnews.ra</a>
<input type="checkbox"/> AFnews	AirForce Radio News update	<a href="http://www.af.mil/news/radio/latest.ram">http://www.af.mil/news/radio/latest.ram</a>
<input checked="" type="checkbox"/> City	Citynews from around the w...	<a href="http://www.citynews.co.uk/">http://www.citynews.co.uk/</a>
<input type="checkbox"/> Counter...	CounterSpin-weekly rt win...	<a href="http://www.webactive.com/webactive/content/cspin">http://www.webactive.com/webactive/content/cspin</a>
<input type="checkbox"/> DIyFeed	The Daily Feed- Satire colu...	<a href="http://www.dailyfeed.com/Latest_Feed.html">http://www.dailyfeed.com/Latest_Feed.html</a>
<input type="checkbox"/> EIC-env	Environmental Information...	<a href="http://www.webactive.com/webactive/audio/raconten">http://www.webactive.com/webactive/audio/raconten</a>
<input type="checkbox"/> Earth	Earth and Sky daily update	<a href="http://www.earthsky.com/today.ram">http://www.earthsky.com/today.ram</a>
<input type="checkbox"/> IaAgg	Iowa Agrigulture news	<a href="http://www.wagnews.com/features/news/ianews.html">http://www.wagnews.com/features/news/ianews.html</a>
<input type="checkbox"/> Leeza	Leeza's entertainment upda...	<a href="http://www.premrad.com/">http://www.premrad.com/</a>
<input type="checkbox"/> MFarm	Missouri Farm Report	<a href="http://www.agnews.com/audio/momr.ram">http://www.agnews.com/audio/momr.ram</a>

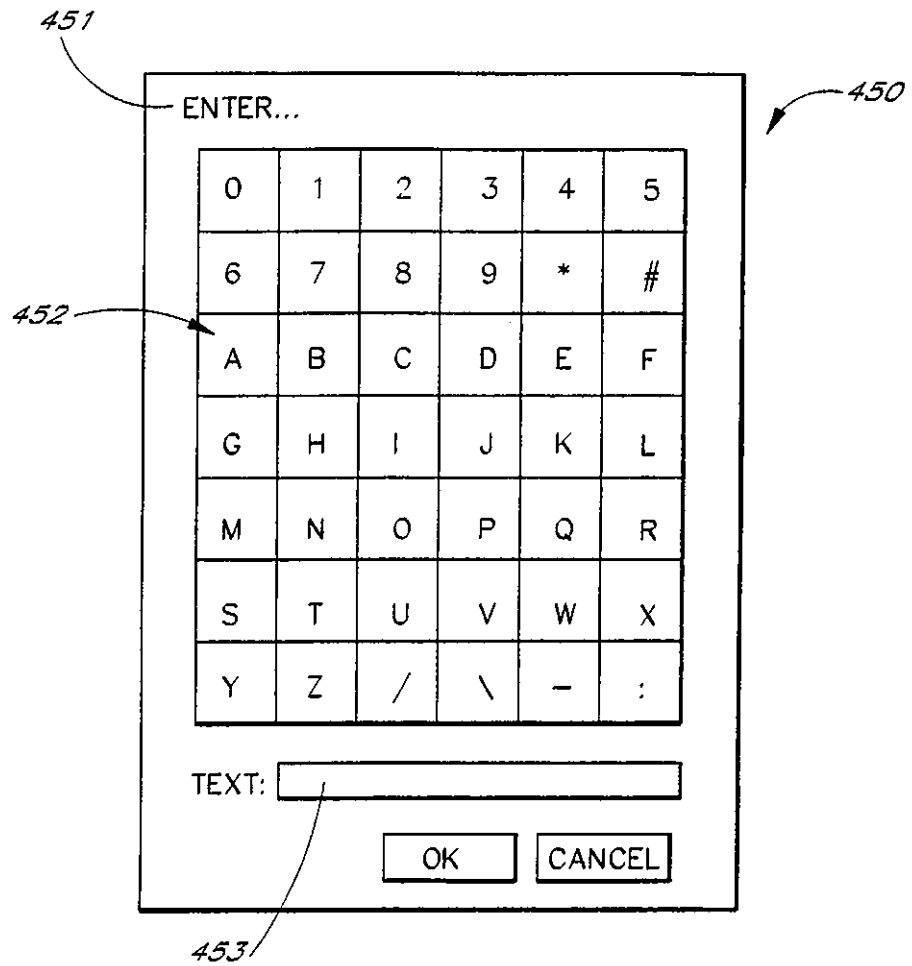


FIG. 4

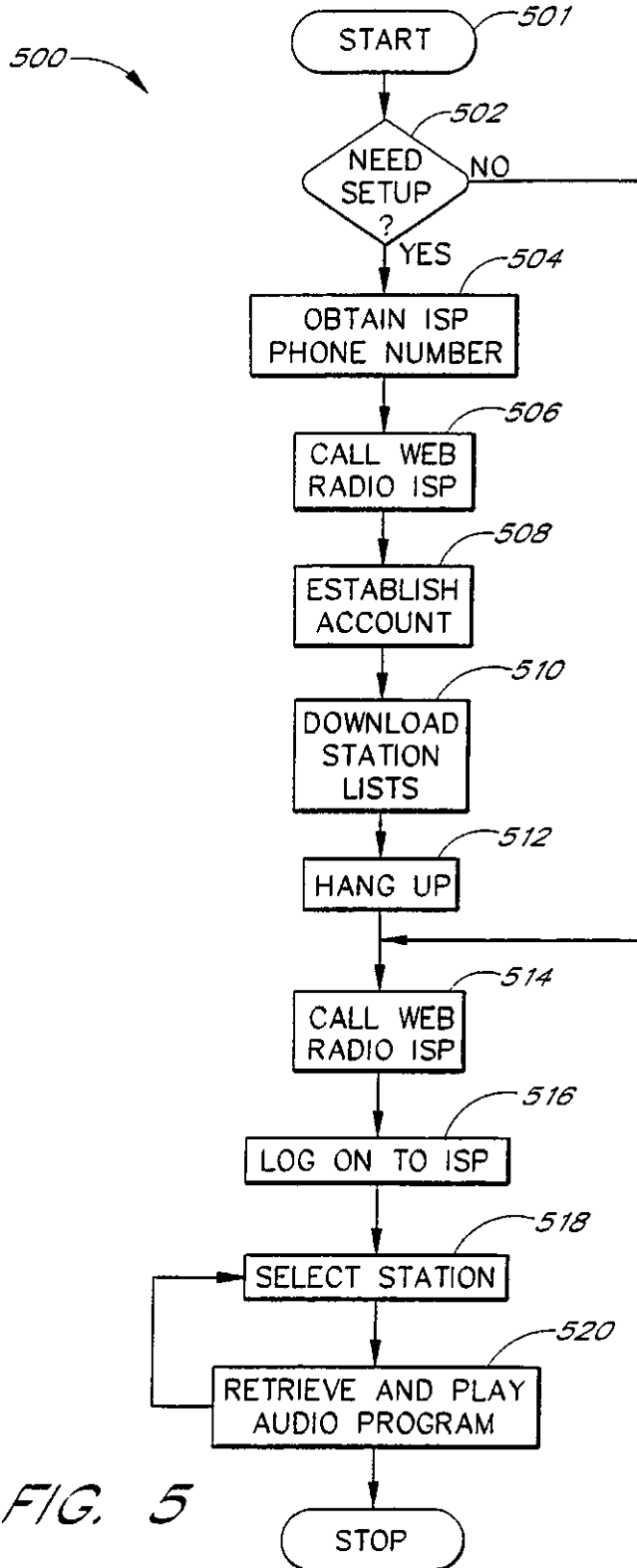


FIG. 5

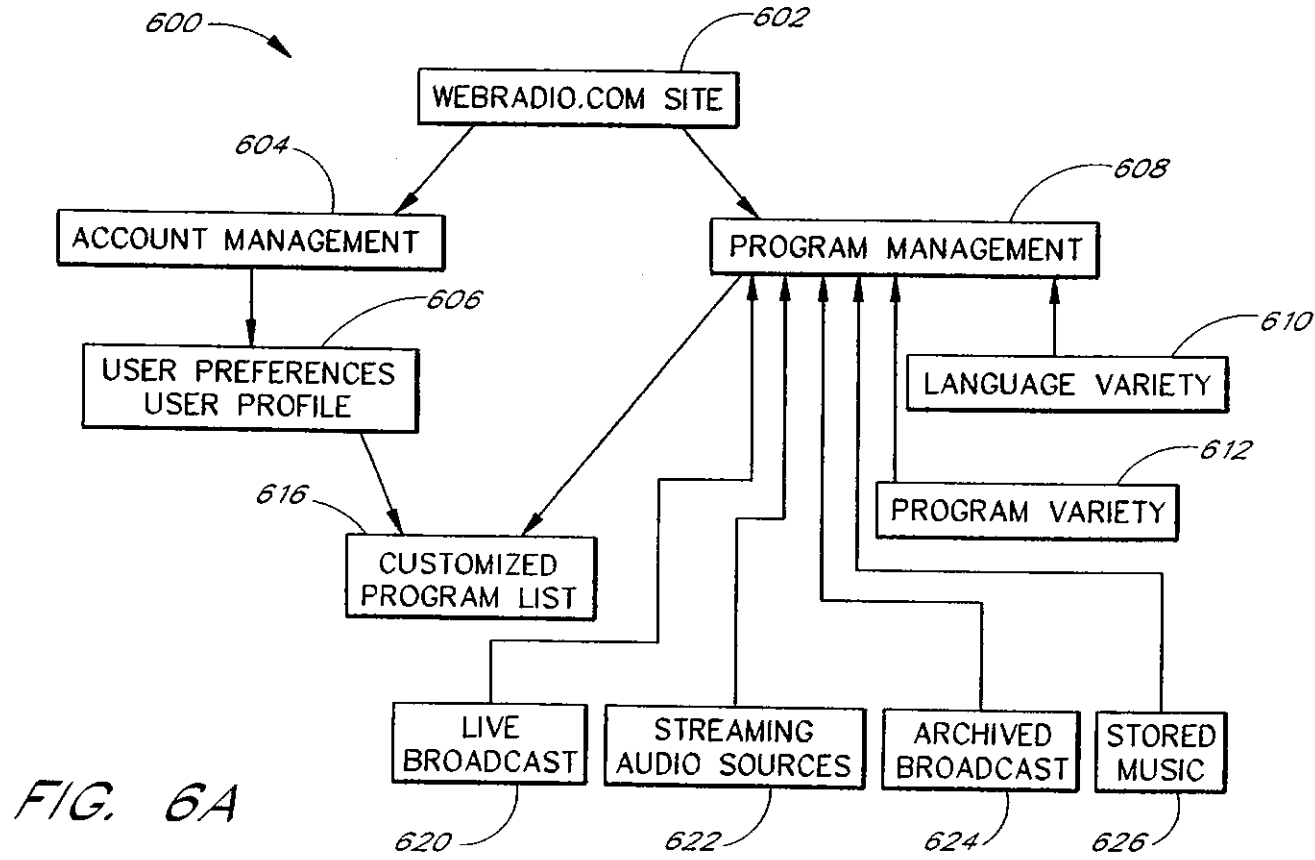


FIG. 6A



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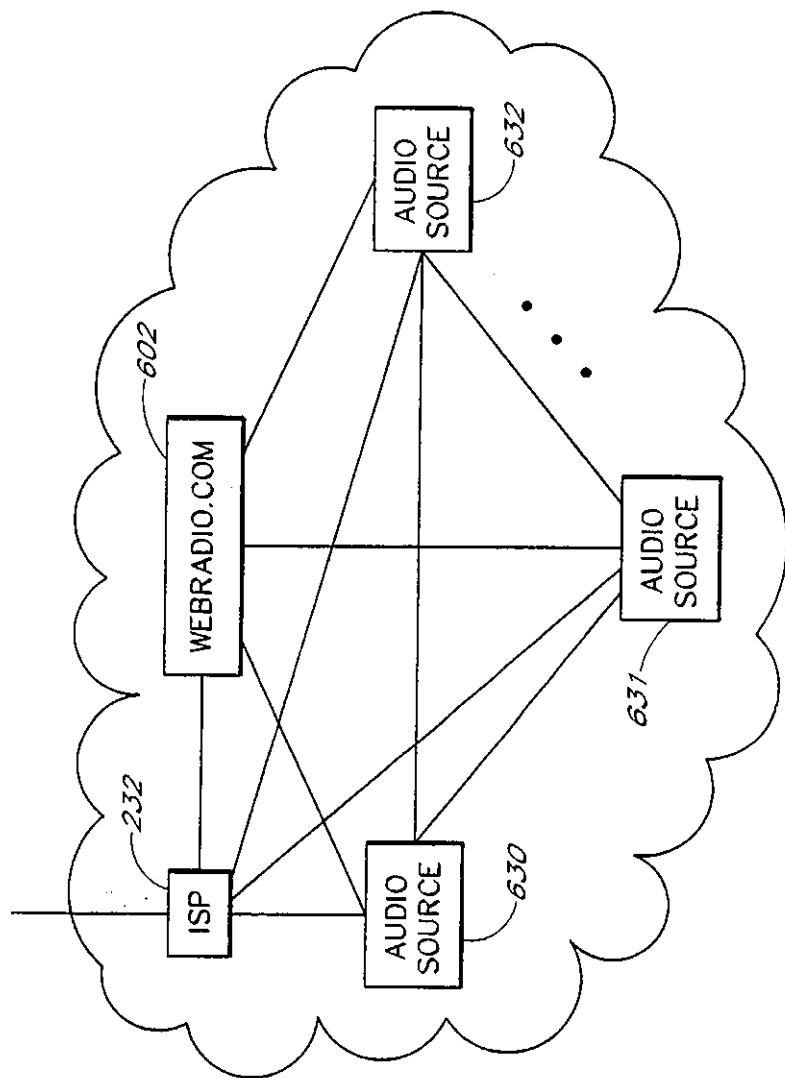


FIG. 6B

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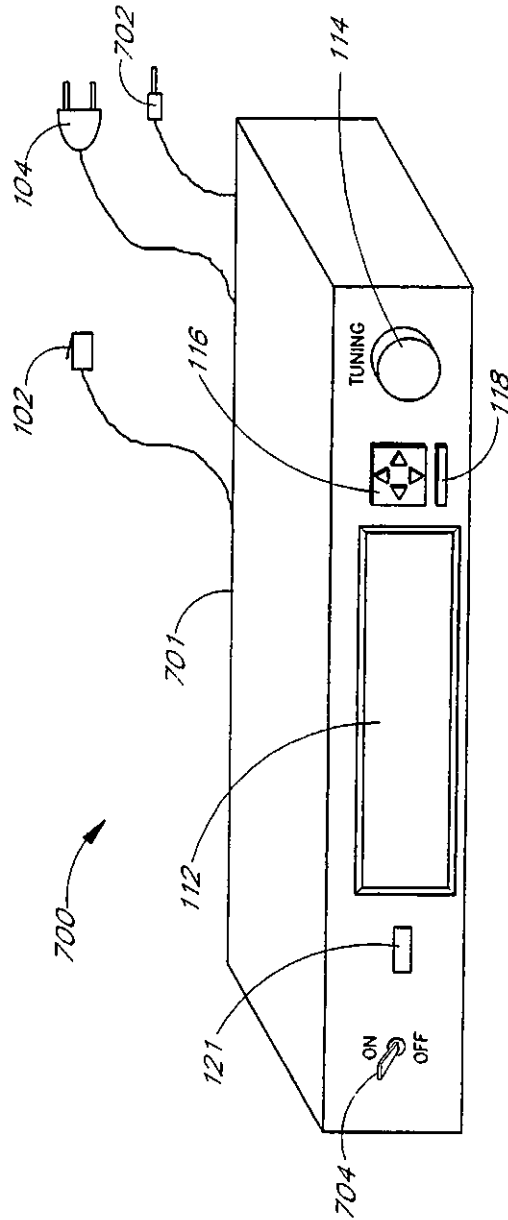


FIG. 7

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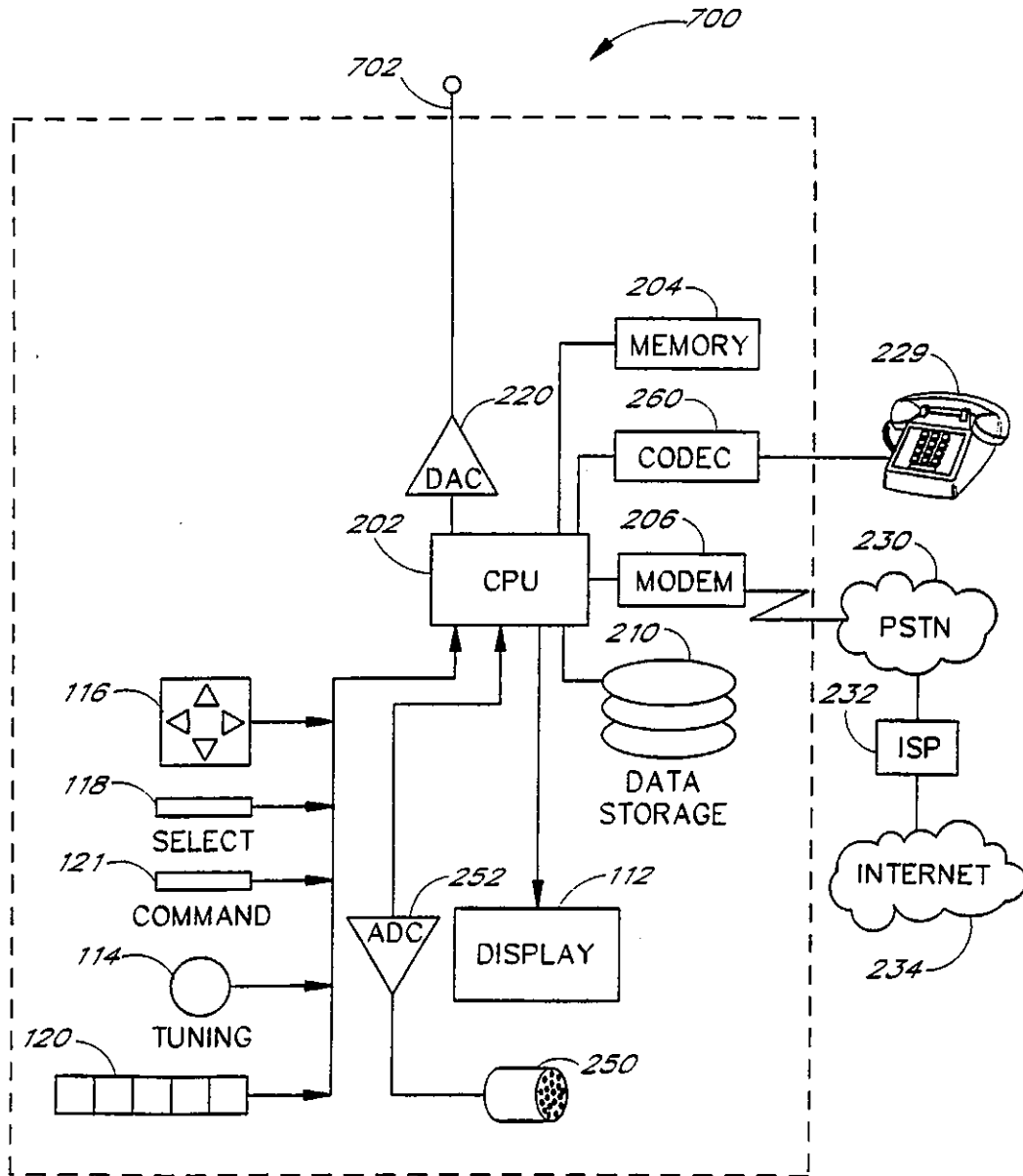


FIG. 8

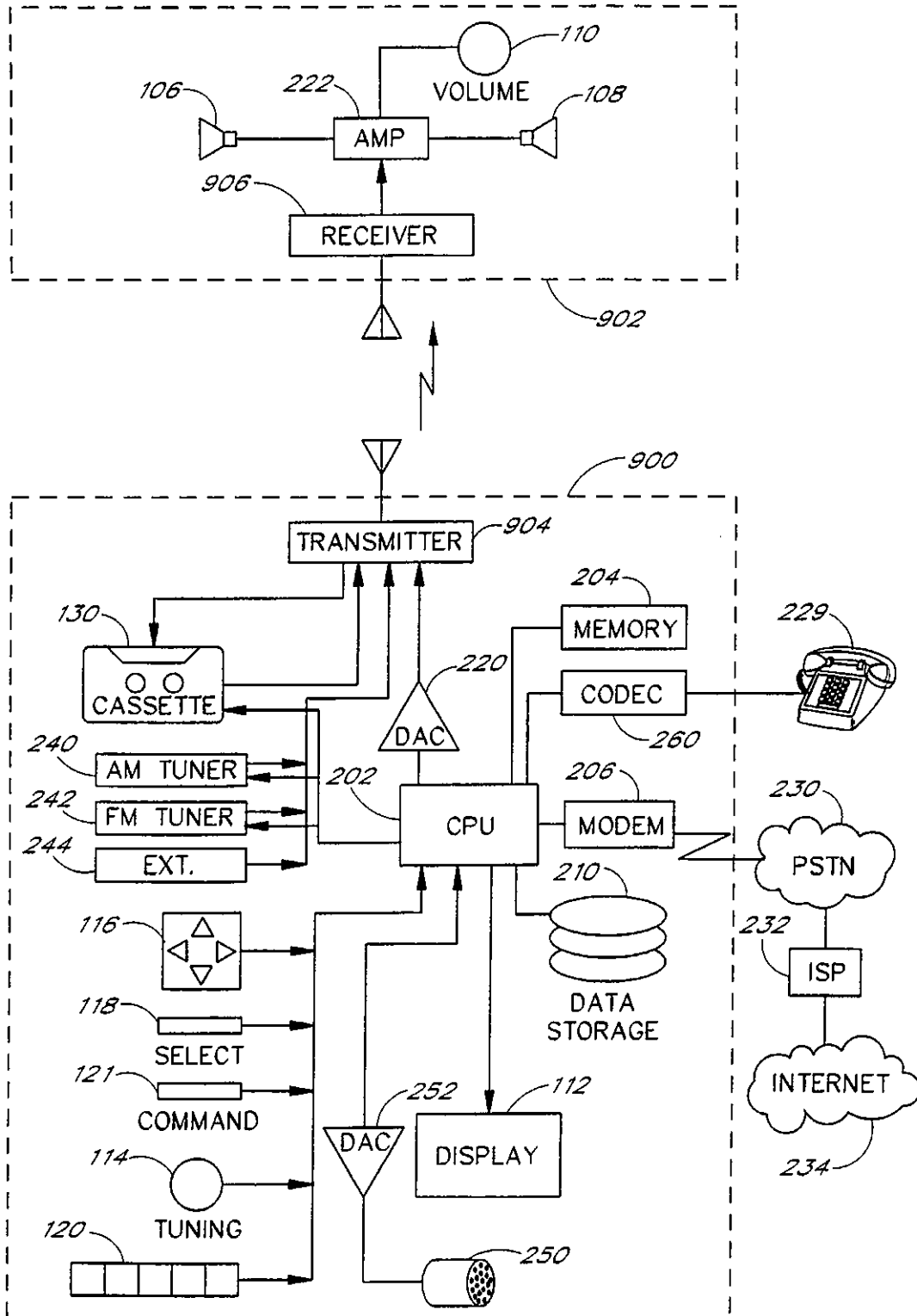
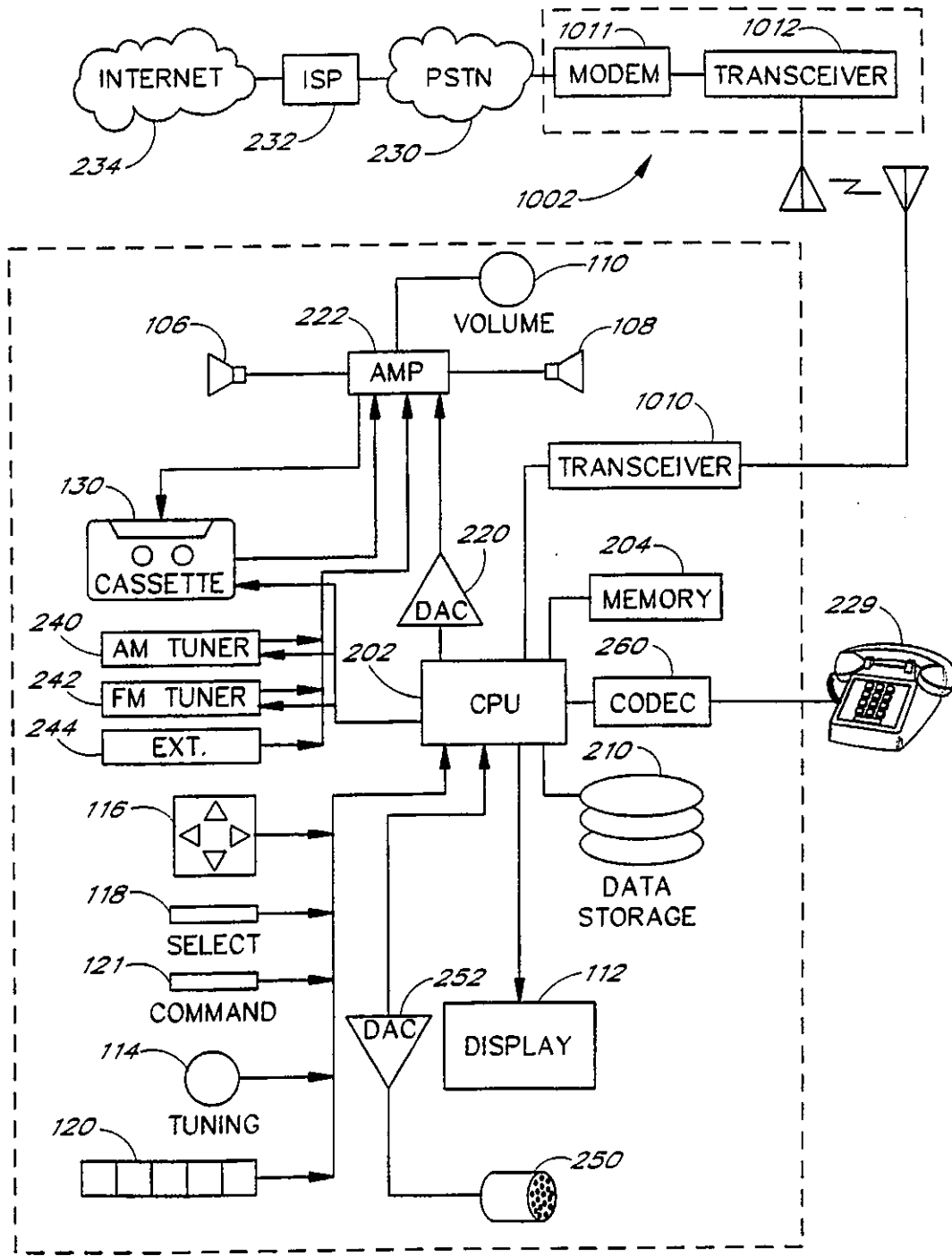


FIG. 9



1000

FIG. 10

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/01001

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(6) : H04B 1/06 US CL : 455/344 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) U.S. : 455/344, 133, 142, 150.1, 164, 164.1, 168.1, 185.1, 182.2, 550, 557, 90 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WEST		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,E	US 5,862,171 A (MAHANY) 19 January 1999, see abstract.	1-49
A,P	US 5,844,893 A (GOLLNICK et al.) 01 December 1998, see entire document.	1-49
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A,P	US 5,818,512 A (FULLER) 06 October 1998, see entire document.	1-49
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	*T*	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*B* earlier document published on or after the international filing date	*Y*	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Z*	document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means		
*P* document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 05 MARCH 1999	Date of mailing of the international search report <b>07 MAY 1999</b>	
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer DARNELL R. ARMSTRONG <i>Joni Hill</i> Telephone No. (703) 306-3015	

# **EXHIBIT 15**



US007187947B1

(12) **United States Patent**  
**White et al.**

(10) **Patent No.:** **US 7,187,947 B1**  
(45) **Date of Patent:** **Mar. 6, 2007**

(54) **SYSTEM AND METHOD FOR COMMUNICATING SELECTED INFORMATION TO AN ELECTRONIC DEVICE**

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(75) **Inventors:** **Russell W. White, Austin, TX (US); Kevin R. Imes, Pflugerville, TX (US)**

(73) **Assignee:** **Affinity Labs, LLC, Austin, TX (US)**

(\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(Continued)

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(21) **Appl. No.:** **09/537,812**

(22) **Filed:** **Mar. 28, 2000**

(Continued)

(51) **Int. Cl.**  
**H04Q 7/20** (2006.01)

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(52) **U.S. Cl.** ..... **455/556.1; 455/66.1; 455/573; 455/557**

U.S. Appl. No. 60/167,179, filed Nov. 23, 1999.

(58) **Field of Classification Search** ..... **455/412.1, 455/414.1, 556.1, 3.01, 3.03, 3.04, 410, 411, 455/414.2, 414.3, 517, 41.2, 556.2, 66.1, 455/572, 571, 93, 99, 557; 709/217, 218, 709/219, 228, 203; 379/447, 419; 705/26**  
See application file for complete search history.

(Continued)

*Primary Examiner*—Jean Gelin  
(74) *Attorney, Agent, or Firm*—Baker Botts, LLP; Roger J. Fulghum

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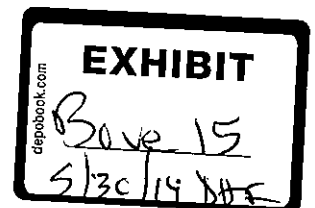
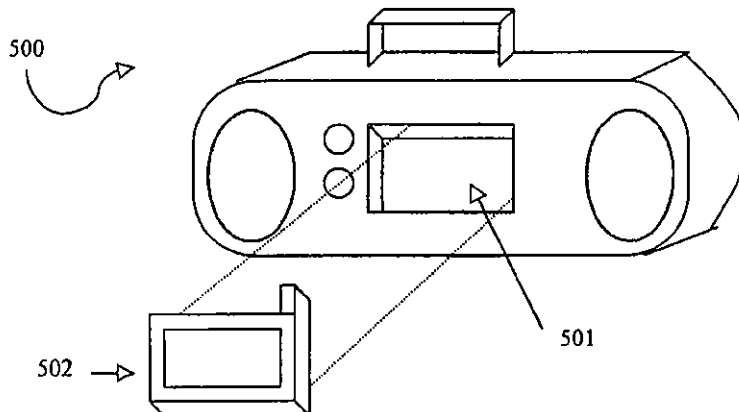
(57) **ABSTRACT**

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Disclosed are a system and method for communicating selected information to an electronic device. The disclosed system may include a digital engine operable to maintain data representing the selected information in a digital format. In some embodiments, the digital engine may be communicatively coupled to a graphical user interface that allows a user to identify the selected information. The system may also include a communication engine communicatively coupled to the digital engine, the communication engine may be operable to wirelessly communicate the data representing the selected information to an electronic device.

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**42 Claims, 9 Drawing Sheets**





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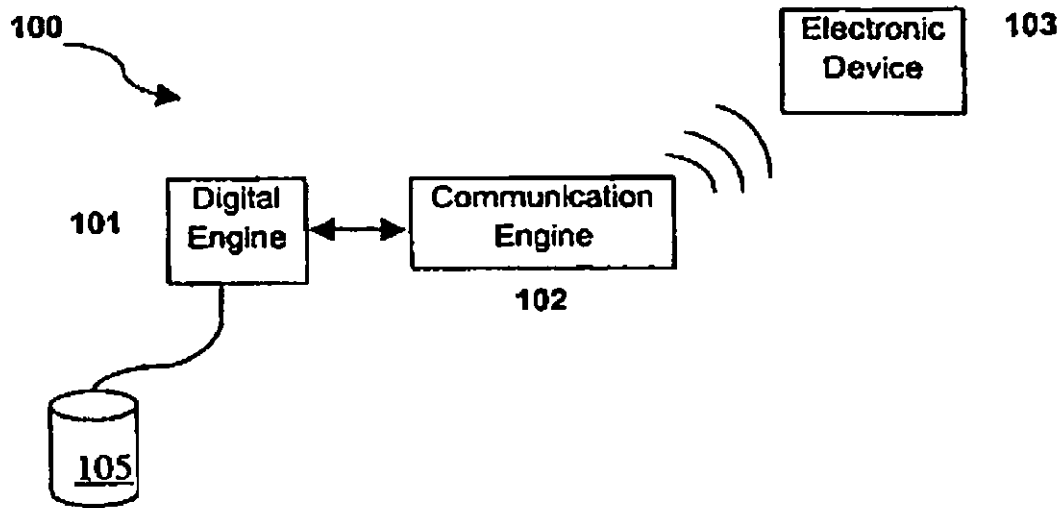
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**FIG. 1**

FIG. 2

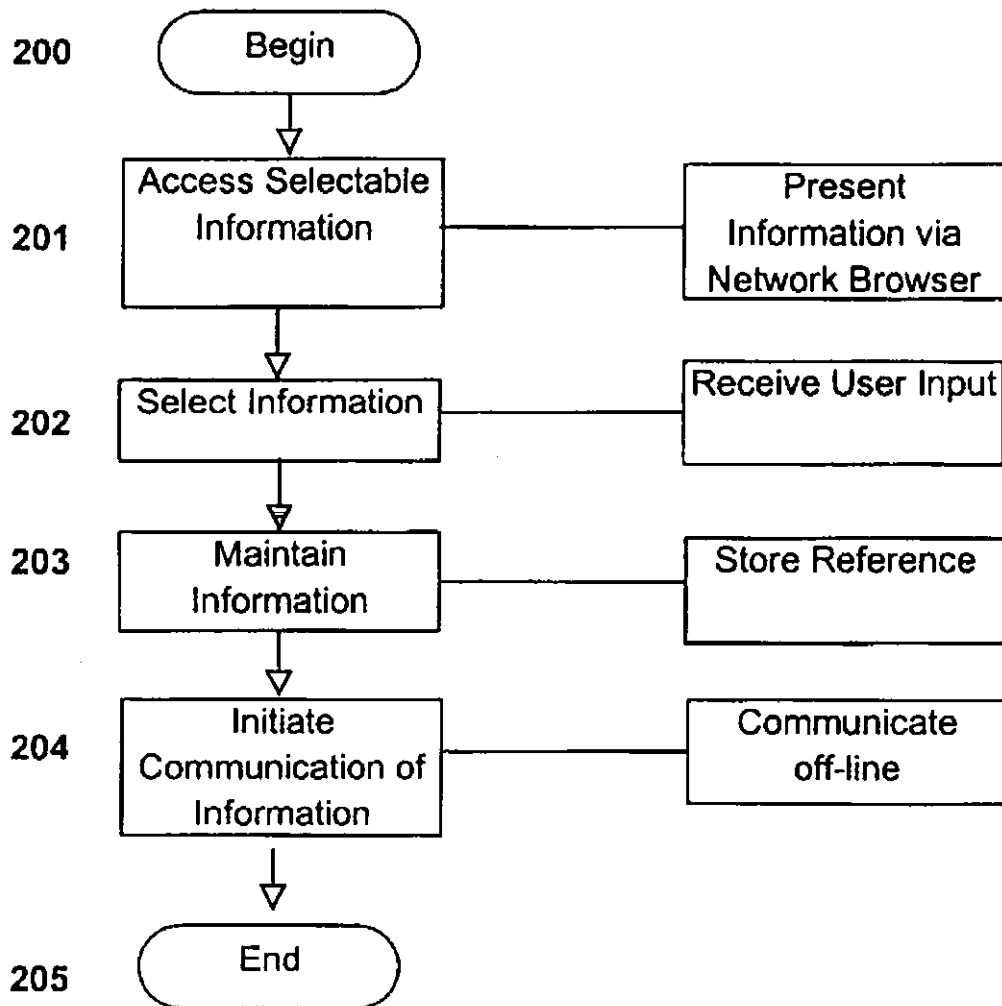


FIG. 3

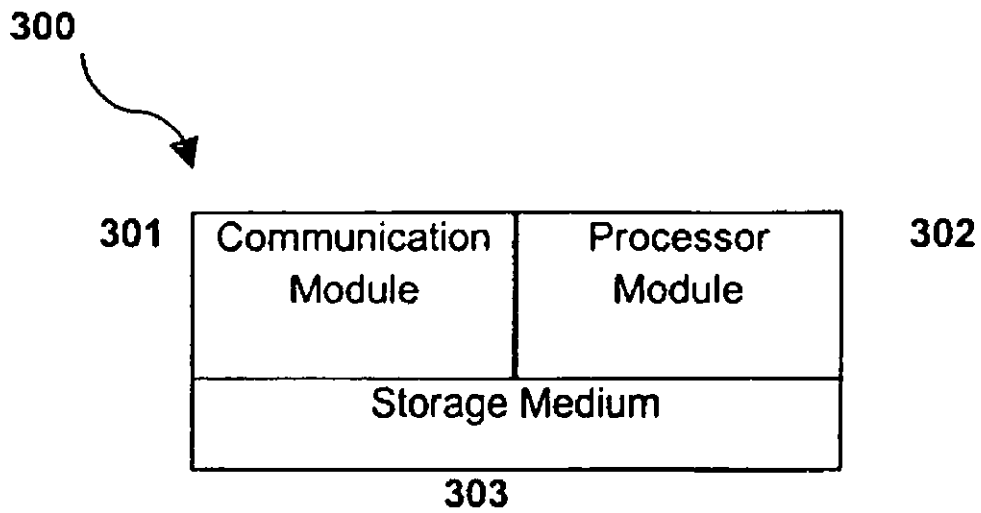


FIG. 4

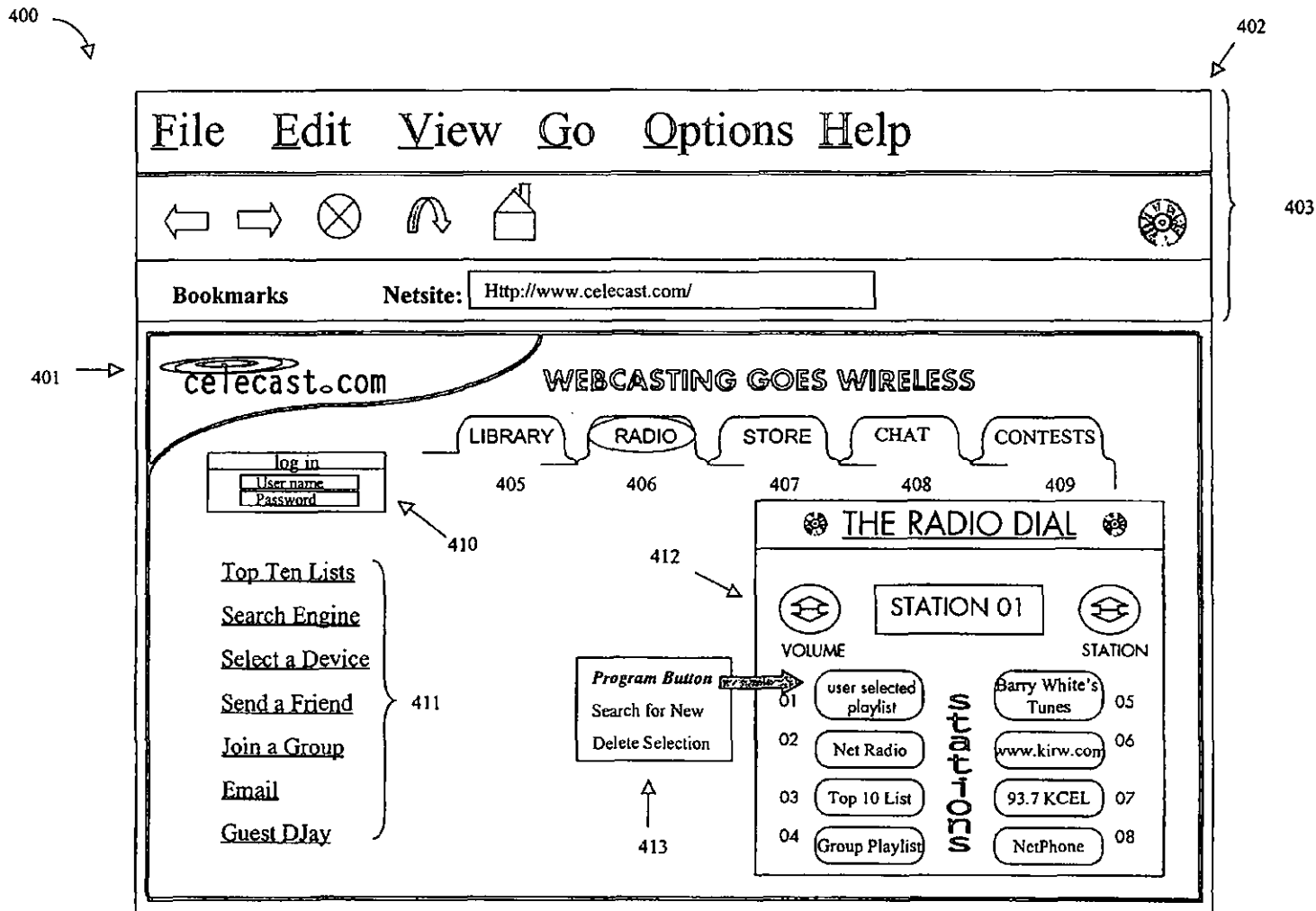


FIG 5A

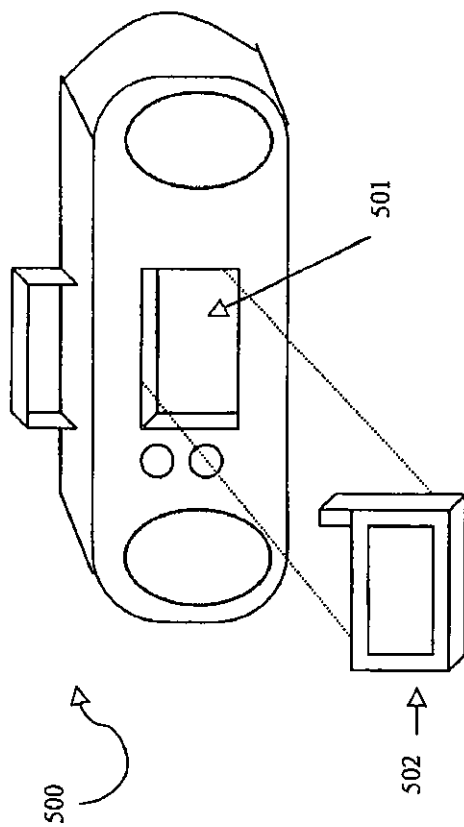
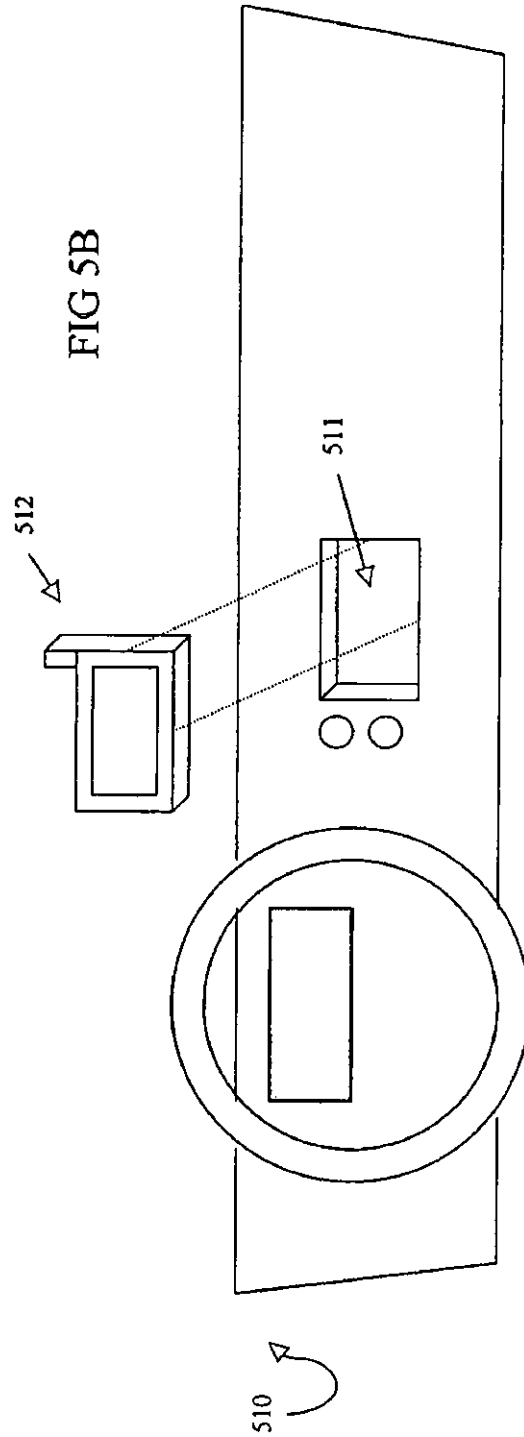


FIG 5B



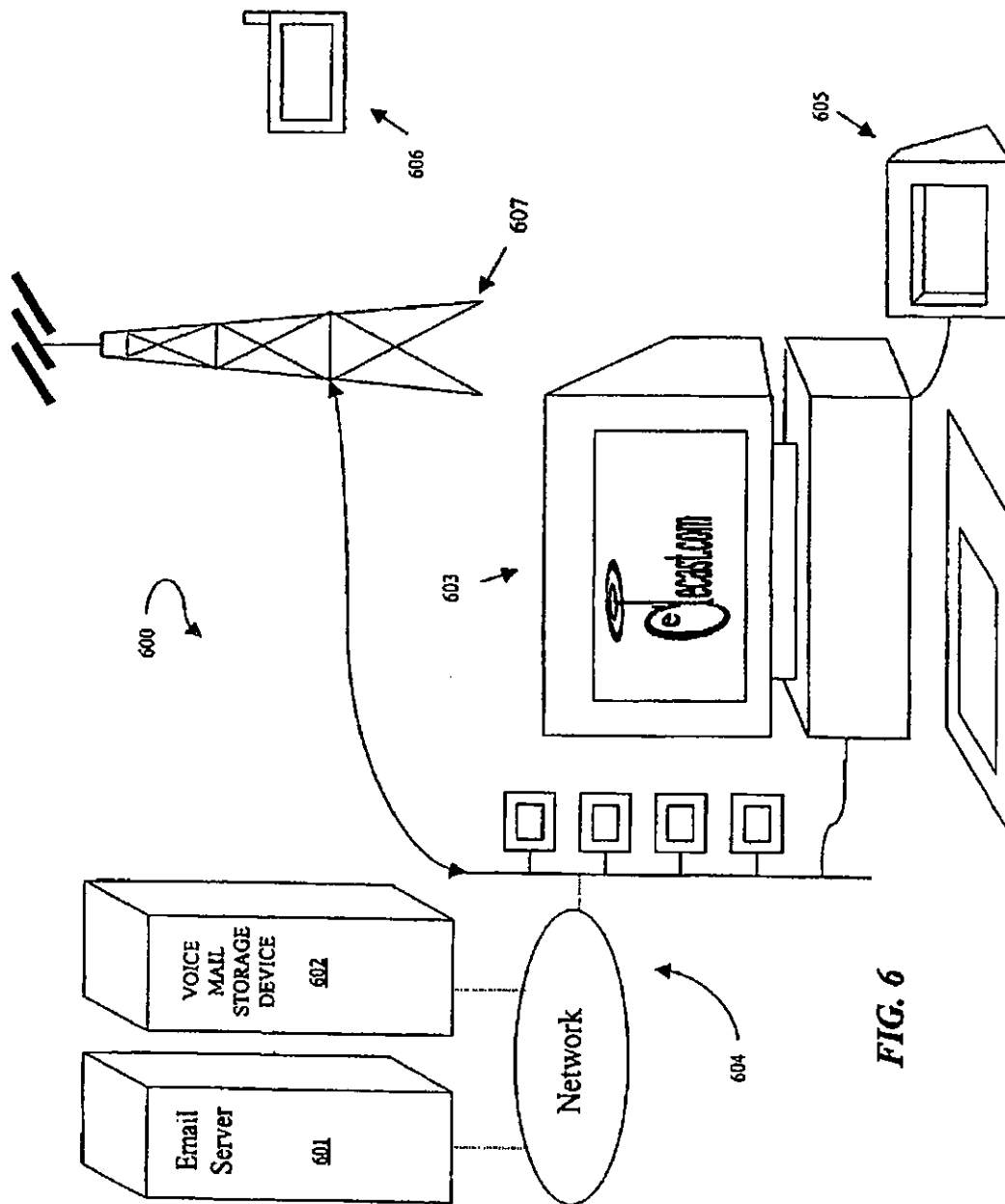


FIG. 6

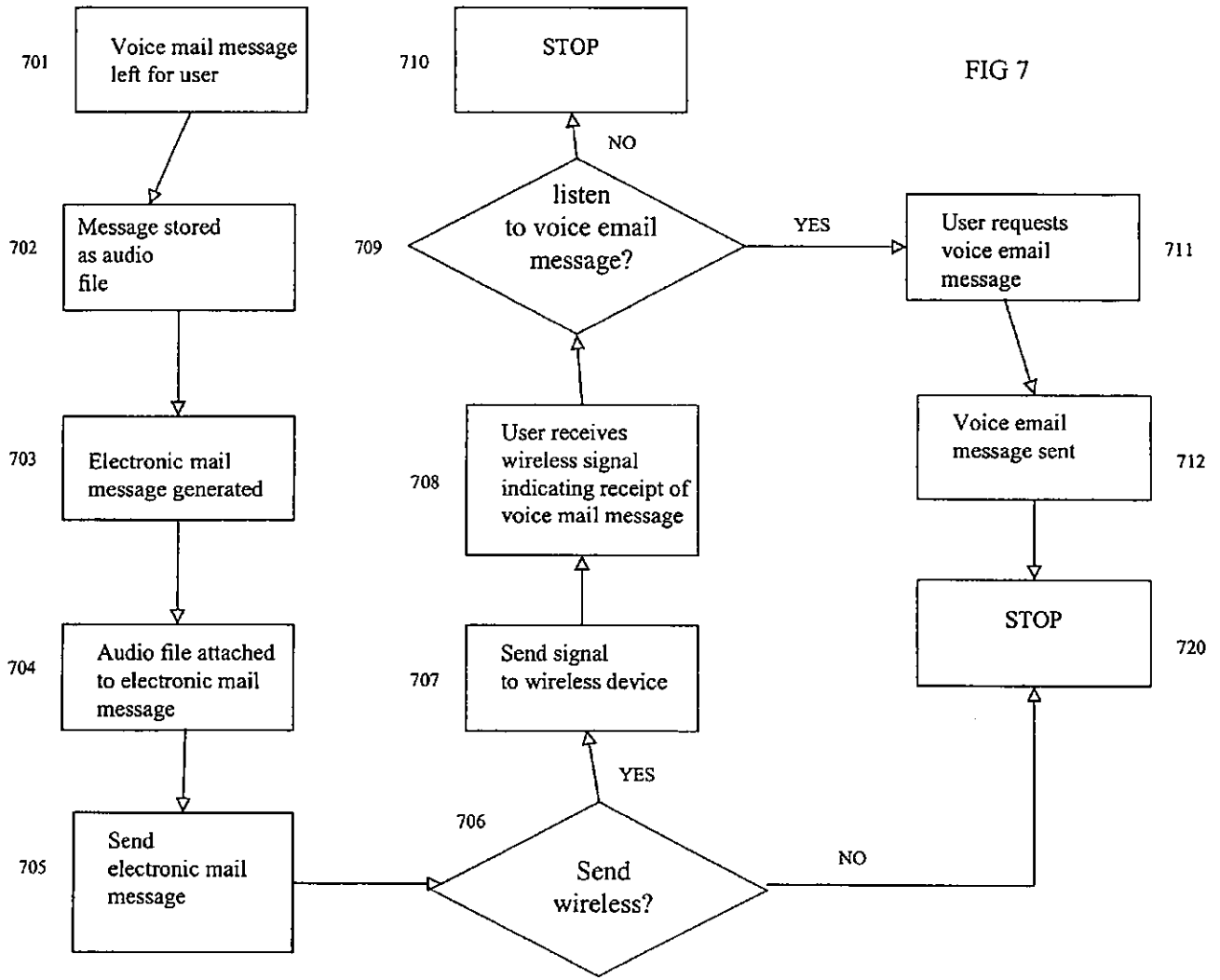


FIG 7



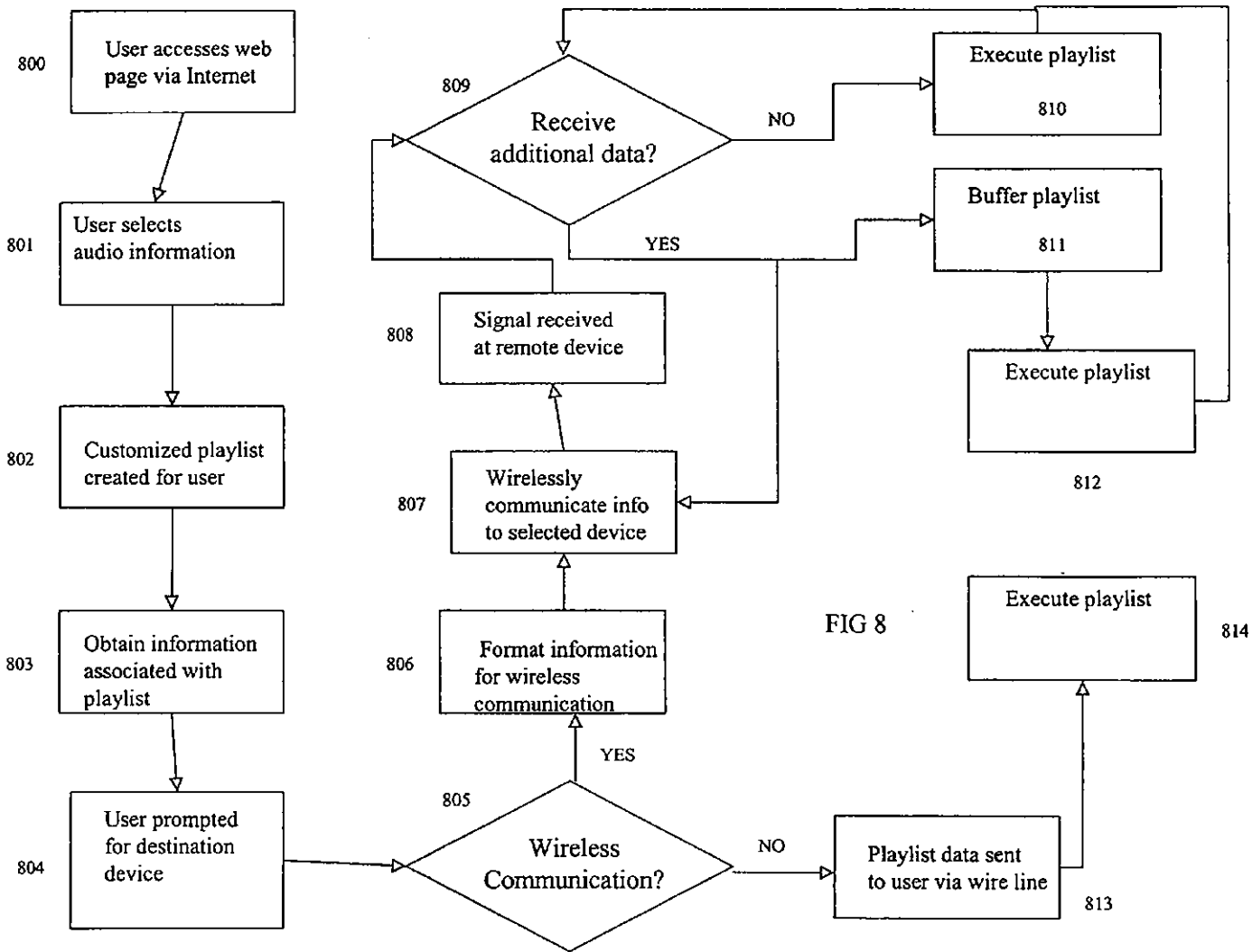
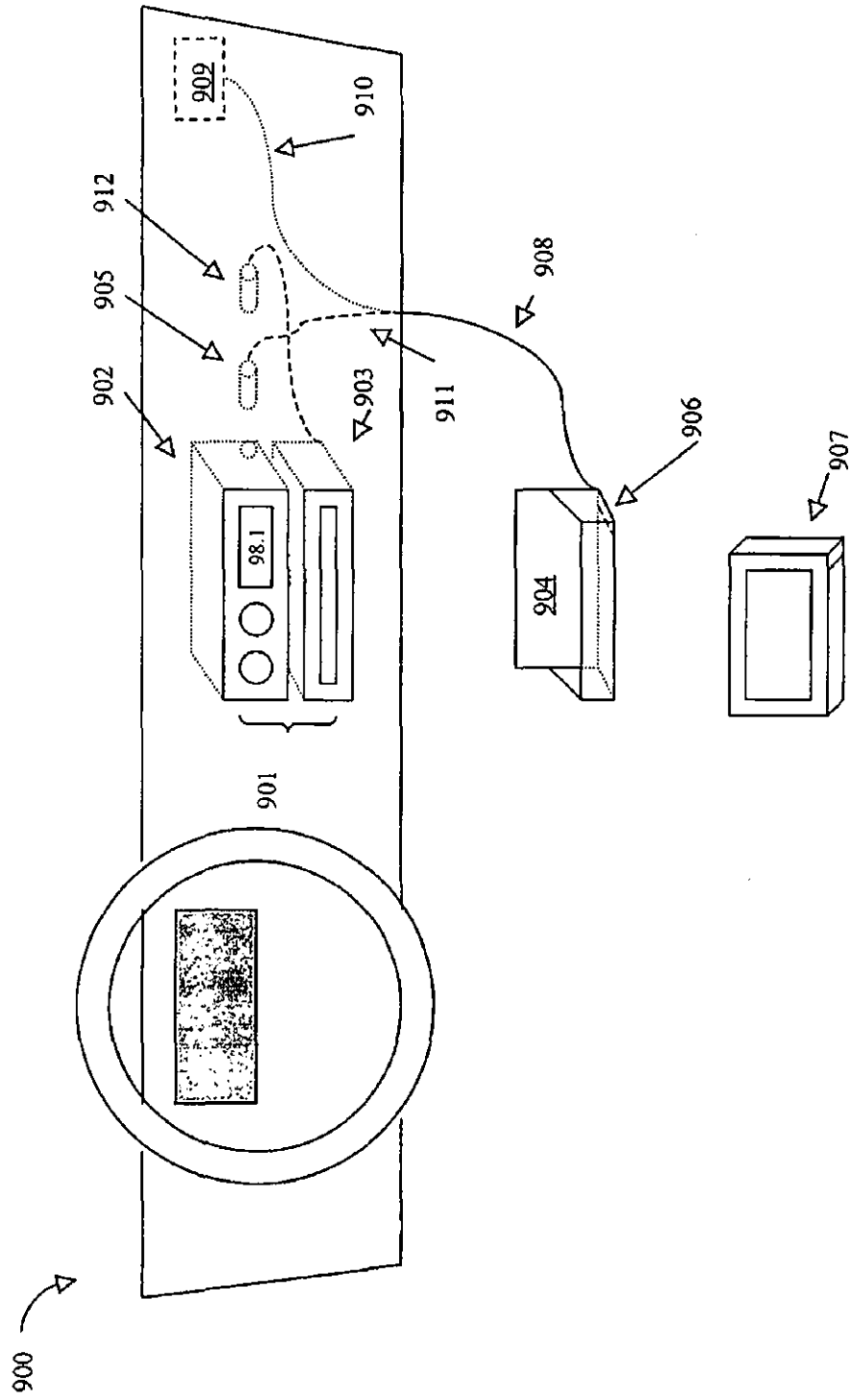


FIG 8

FIG 9



**SYSTEM AND METHOD FOR  
COMMUNICATING SELECTED  
INFORMATION TO AN ELECTRONIC  
DEVICE**

TECHNICAL FIELD OF THE INVENTION

The present disclosure relates in general to the field of wireless communication, and more particularly to a system and method for communicating selected information to an electronic device.

BACKGROUND OF THE INVENTION

The first commercial radio stations in the United States began operation around 1920. Today, there may be as many as 12,000 radio stations in the United States programming in several distinct formats. When broadcasting their respective signals, these radio stations often use an analog signal, which may be modulated based on frequency or amplitude. Frequency modulated (FM) radio appears to be the dominant entertainment medium while amplitude modulated (AM) radio seems to be a popular outlet for news and information.

Unfortunately, analog radio may be unable to provide the sound quality and consistency that radio listeners desire. As such, several broadcasting related companies have begun to consider a movement to digital radio. Unlike analog radio reception, digital radio reception may be able to provide compact disk (CD) quality sound while remaining virtually immune to interference. Being immune to interference may result in reducing static growls or 'multipath' echoes, echoes caused by signal reflections off buildings or topographical features.

Some countries, like Canada and many European countries, may choose to have digital radio operate in a single digital radio band such as the L-band between 1452-1492 megahertz (MHz). This band would allow the reception of both terrestrially and satellite-originated signals. By comparison, FM radio typically operates between 88 and 108 MHz while AM radio typically operates between 0.525 and 1.705 MHz. Neither of these bands allows for easy transmission via satellite.

Canada proposed using the L-Band for digital radio as early as 1992. Several countries throughout the world have since agreed to use the L-Band for digital radio with one notable exception. It appears the United States has chosen not to operate its digital radio within the L-Band. In the United States, the L-Band may already be committed for military uses. Apparently, the United States plans to adopt a system called in-band on-channel, or IBOC, which fits within the AM and FM frequencies.

IBOC technology may offer some advantages over L-Band transmissions. For example, there may be no need for new spectrum allocations. There may be backward and forward compatibility with existing AM and FM systems on both the transmitter and receiver sides, and there may be a low-investment upgrade to digital systems. Unfortunately, a workable IBOC solution is yet to be seen though technology may someday make IBOC digital radio commercially possible.

Even if an IBOC solution becomes commercially available in the United States, IBOC digital radio may suffer from several shortcomings. For example, there may global standardization problems. Though the United States favors IBOC, the European and Canadian communities seem to favor L-Band making the establishment of a global standard difficult.

SUMMARY OF THE INVENTION

In accordance with teachings of the present disclosure, a system and method for communicating selected information to an electronic device are disclosed that provide significant advantages over prior developed systems. The disclosed embodiments allow a radio listener to create a personal playlist and to listen to this playlist in a wireless atmosphere while enjoying CD quality sound.

According to one aspect of the present disclosure, a system incorporating teachings of the present invention may include a digital engine operable to maintain data representing the selected information in a digital format. In some embodiments, the digital engine may be communicatively coupled to a graphical user interface that allows a user to identify the selected information. The system may also include a communication engine communicatively coupled to the digital engine, the communication engine may be operable to wirelessly communicate the data representing the selected information to an electronic device.

The wireless communication may involve communicating via a cellular communications network. The cellular communications network may be, for example, the global system for mobile communications network (GSM), which may operate around 1.8 GHz or 1.9 GHz. The cellular communications network may also involve, for example, the code-division multiple access network (CDMA). In some embodiments, the wireless communication may involve communicating via a high-speed, low-power microwave wireless link. For example, the wireless link may include a Bluetooth link, which may operate around 2.4 GHz.

According to another aspect of the present invention, a system for communicating selected information to an electronic device is disclosed. The system includes a digital engine operable to maintain data associated with selected audio information and a communication engine communicatively coupled to the digital engine, the communication engine operable to initiate wireless communication of the data to the electronic device.

According to another aspect of the present invention, a method for communicating selected audio information to an electronic device is provided. The method includes maintaining data associated with the selected audio information using a digital engine, and initiating wireless communication of the data to the electronic device.

According to another aspect of the present invention, an electronic device for receiving selected audio information via wireless communication is provided. The device includes a communication module operable to receive wireless communication of the selected audio information, a storage medium operably coupled to the communication module, the storage medium operable to store the selected audio information, and a processor module coupled to the communication module, the processor module operable to process the received selected audio information.

According to another aspect of the present invention, a method for communicating selected audio information to an electronic device is provided. The method includes presenting information associated with audio information within an interface associated with a communication network, receiving an input from a user identifying the selected information, maintaining data associated with the selected audio information using digital engine, and initiating wireless communication of the data to the electronic device.

According to a particularized aspect of the present invention the interface operates in a browsing environment and the wireless communication operates outside the browsing environment.

Other technical advantages will be apparent to those of ordinary skill in the art in view of the following specification, claims, and drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the present embodiments and advantages thereof may be acquired by referring to the following description taken in conjunction with the accompanying drawings, in which like reference numbers indicate like features, and wherein:

FIG. 1 depicts a general system for wirelessly communicating selective information to an electronic device in accordance with one aspect of the present invention;

FIG. 2 illustrates a block diagram of a method of wirelessly communicating selected information to an electronic device;

FIG. 3 illustrates an electronic device operable to receive selected audio information in accordance with the teachings of the present invention;

FIG. 4 illustrates a graphical user interface (GUI) for displaying selectable audio information according to one aspect of the present invention;

FIG. 5A illustrates a portable radio system having a mount for an electronic device according to one embodiment of the present invention;

FIG. 5B illustrates automobile console having a mount for coupling an electronic device according to one aspect of the present invention;

FIG. 6 illustrates a block diagram of a system for communicating voice mail messages using email according to one embodiment of the present invention;

FIG. 7 illustrates a flow chart for providing voice email messages according to one embodiment of the present invention;

FIG. 8 illustrates a flow diagram of a method for providing selected audio information to an electronic device according to one embodiment of the present invention; and

FIG. 9 illustrates an automobile console having a mount for an electronic device according to one embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

The conceptual groundwork for the present invention includes wirelessly communicating selective information to an electronic device. According to one aspect, a user may interact with the Internet to select information, such as audio information, and wirelessly communicate the selected information to an electronic device. The electronic device receives the information via a wireless communications network and processes the information accordingly. In a particularized form, a user may select information from an Internet website operable to allow selectivity of audio information such as songs, on-line radio stations, on-line broadcasts, streaming audio, or other selectable information. Upon selecting the audio information, information or data associated with the selected audio information is wirelessly communicated to an electronic device. The electronic device may then be used to process the selected audio information. In this manner, a user may receive selective audio information via a wireless electronic device.

In one form, the electronic device may be operable to communicate with an individual's automobile audio system. A user may select audio information utilizing a personal computer with access to a website operable to display selectable audio information. The selected audio information may then be wirelessly communicated to the electronic device associated with an automobile's audio system. Therefore, upon receiving the selected audio information, a user may access and play the received audio information utilizing the electronic device in association with the automobile's audio system.

The present invention is not limited to communicating only audio information. One skilled in the art can appreciate that other types of information, such as video, textual, etc. may be communicated utilizing the systems and methods disclosed herein without departing from the spirit and scope of the present invention. Additionally, it will be understood that information may be formatted in a plurality of ways at different phases of communication without losing the underlying content of the selected information. For example, an audio file may be formatted, segmented, compressed, modified, etc. for the purpose of providing or communicating the audio information. Therefore, the term 'audio information' or 'information' is used in a general sense to relate to audio information in all phases of communication.

FIG. 1 depicts a general system for wirelessly communicating selective information to an electronic device in accordance with one aspect of the present invention. The system, illustrated generally at 100, includes a digital engine 101 coupled to a communications engine 102. Communications engine 102 is remotely coupled to an electronic device 103. Digital engine 101 may be directly or indirectly coupled to storage device 105 operable to store information.

Digital engine 101 maintains information or data associated with selected information in a digital format. The information may be stored within storage device 105 or other storage devices operable to maintain data or information associated with the selected information. Communications engine 102 is communicatively coupled to digital engine 101 and operable to wirelessly communicate the selected information to electronic device 103.

During operation, audio information may be selected by a user utilizing a personal computer or other devices operable to communicate with an information network. Digital engine 102 is operable to maintain information associated with the selected audio information. For example, the information could be several songs or titles configured as an audio file and formatted in a digital format such as an MP3 file, wave file, etc. The maintained information may also be a reference to a network location where an audio file may be stored, a network location where a network broadcast of audio information may be located, etc. or other network locations having information associated with the selected audio information. Therefore, digital engine 101 may maintain a plurality of different types of information or data associated with the selected audio information. System 100, utilizing communication engine 102, may wirelessly communicate data or information associated with the selected audio information to electronic device 103 thereby providing wireless communication of selected information to an electronic device operable to receive wireless communications.

In one embodiment, digital engine 101 may be used in association with an Internet website configured to provide access to selectable information. The Internet website operably associated with digital engine 101 allows a user to select information to be wirelessly communicated to elec-

tronic device 103 utilizing a network environment. The Internet website may include several different types of information related to audio information. FIG. 4, described in greater detail below, illustrates one embodiment of providing an Internet website for displaying selectable audio information. For example, the Internet website may include music and/or artist search engines, playlists, top 10 charts, artists by genre, and other information associated with audio information. A user may select information associated with the audio information and digital engine 101 can maintain the information or data associated with the selected information in a digital format. Communications engine 102 coupled to digital engine 101 may wirelessly communicate data associated with the selected audio information to electronic device 103. Therefore, a user may access and select audio information via an Internet website and wirelessly communicate the data to an electronic device. As such, system 100 advantageously allows for wireless communication of selected audio information to electronic devices that may be remotely located from a conventional terrestrial communication network.

Electronic device 103 may be configured in a plurality of ways for receiving wireless communication of selected audio information. In one embodiment, electronic device 103 may be operable as a component configured to receive a cellular signal comprising the selected information communicated by the communication engine. For example, a device having a cellular modem may be operable to receive the information at specified intervals. Upon receiving the information the electronic device may process the received information. Electronic devices are described in more detail below and may include a network radio, a modular device, an audio system, a personal digital assistant (PDA), a cellular phone, or other electronic devices operable to receive information wirelessly communicated by communication engine 102.

Communications engine 102 may be operable to wirelessly communicate selected information to electronic device 103 in a plurality of ways. The present invention advantageously allows for several different embodiments of wirelessly communicating selected audio information to electronic device 103 and is not limited to any specific configuration described below.

Several different types or combinations of wireless communication may be realized by the present invention. Communications engine 102 may be operable to wirelessly communicate the selected information from a information network, such as the Internet, to an electronic device operable to receive wireless communications. In one embodiment, communications engine 102 may comprise a conduit to interface information with a wireless communication network. The conduit may configure the information located within the information network into a format operable to be transmitted via wireless communication. For example, a wireless device may be operable to receive packets of information having a specific size and in a specific format. In such an embodiment, communications engine 102 could format the information into a desirable format for wirelessly communicating the information to electronic device 103.

Several types of wireless communication may be used by communications engine 102 to communicate the selected information to an electronic device. Communications networks such as GSM, Digital Satellite communication, SB, Radio bands, DRC, SuperDRC or other systems or types of transmission such as TDMA, CDMA, spread spectrum, etc. or frequencies such as between about 1.7 GHz and 2.0 GHz may be realized by the present invention for communicating

information or data representing the selected audio information to electronic device 103.

In one embodiment, the selective information may be communicated using a digital broadcast signal. Digital broadcast includes providing information via a signal such as AM, FM, and the like. Digital information may be included or encoded as a sub-carrier within the broadcast signal and received by electronic device 103. A digital sub-carrier may include a selective bandwidth of frequencies for a specific radio station (i.e. 6 MHz for FM). The selective information may be wirelessly communicated to electronic device 103 utilizing a communication engine 102 operable to communicate the selective information via a digital FM signal. In this manner, selective information may be communicated within digital FM sub-carriers to an electronic device operable to receive the information. For example, a user may subscribe to communicate the information via an FM sub-carrier and receive the selective data through wireless communication via a specified FM sub-carrier.

In one embodiment, the selected information may be formatted and transmitted to achieve a desirable transmission rate. For example, conventional systems may transmit information at a speed of 10 kilobits per second. Therefore, for 1 megabyte of information to be communicated to an electronic device, a transmission time of approximately 800 seconds may be required. The present invention may allow for a relative increase in transmission speed by removing the requirement that information be communicated asynchronously to an electronic device. For example, conventional wireless communication utilize a specified frequency to communicate information in two directions (i.e., cellular phones). As such, information is communicated across a channel in an asynchronous manner to provide a continuous audio signal to the recipient. The present invention advantageously allows for signals to be transmitted to an electronic device in a less than asynchronous manner. For example, if a user selected a song to be wirelessly communicated to an electronic device, system 100 could communicate the information in a less than asynchronous manner allowing the selected information to be transmitted efficiently thereby decreasing the overall download time for the selected audio information.

In one embodiment, the selected information may be compressed and transmitted across the same frequency but at different phases thereby allowing plural signals having different phases to be wirelessly communicated to an electronic device. Therefore, the electronic device may be operable to receive multiple phased signals and process the selective information accordingly.

In one embodiment, the information may be wirelessly communicated at a relatively slow transmission rate. For example, a user may schedule when the selected audio information may be used by electronic device 103. The user may select several different audio tracks or songs to be transmitted to an electronic device associated with the user's vehicle such that the user can listen to the user selected audio information during the drive home at the end of a work day. Therefore, it may be desirable to utilize a slower transfer speed due to the extended amount of time available prior to actual use of the selected audio information. In this manner, communications networks having less or slower transfer rates may be used to wirelessly communicate the selected audio information to the electronic device.

In another embodiment, high speed wireless communication networks may be used to communicate the selected audio information. For example, a user may want to listen to an Internet broadcast of an Internet radio station. Therefore,

high speed communication may be required to wirelessly communicate or stream the selected audio information to an electronic device.

In another embodiment, a hybrid of wireless communication rates may be deployed depending on the requirements of the selected audio information and/or the electronic device. For example, the selected audio information may first be transmitted to the electronic device via high speed communication until enough information has been wirelessly communicated and buffered into a memory device operably associated with the electronic device. Upon communicating a certain percentage of the selected audio information, slower communication speeds may then be used to communicate additional selected audio information.

Therefore, system 100 may be configured in a plurality of ways to communicate selected information to electronic device 103. Digital engine 101 may be used to maintain data or information associated with the selected information and communication engine 102, communicatively coupled to digital engine 101, may wirelessly communicate selected information to electronic device 103.

FIG. 2 illustrates a block diagram of a method of wirelessly communicating selected information to an electronic device. The method may be used in association with the system illustrated in FIG. 1 or other systems operable to utilize the method of FIG. 2.

The method begins generally at step 200. At step 201 selectable audio information may be accessed utilizing a network communications device. For example, selectable audio information may be displayed at an Internet website accessible by a personal computer. In another embodiment, the selectable information may be accessed utilizing a wireless communications device such as, a cellular phone, a PDA device, or other devices operable to provide access to the selectable audio information. Upon accessing the selectable information, the method proceeds to step 202 where a user can identify or select audio information to be wirelessly communicated to an electronic device. For example, a user may select an entire album to be wirelessly communicated to a PDA device.

Upon the user selecting the audio information, the method proceeds to step 203 where the method maintains information associated with the selected information. In one embodiment, the information may be an audio file, such as a wave file, and MP3 file, etc. representative of the selected audio information. In another embodiment, a network location that comprises a file representing the selected information may be maintained. Another example may include a network location of a network broadcast of audio information. Therefore, the method at step 203 may maintain several different types of information associated with the selected audio information.

Upon maintaining information or data associated with the selected information, the method proceeds to step 204 where the method wirelessly communicates information associated with the selected information to an electronic device. For example, if an audio file associated with the selected audio information was maintained, the method would communicate the audio file to the electronic device. In another embodiment, a link or network address broadcasting the selected audio information may be accessed and, at step 204, wirelessly communicated to an electronic device. In another embodiment, a combination of different types of audio information may be wirelessly communicated to an electronic device. Upon transmitting the selected audio information, the method proceeds to step 205 where the method ends.

Selected audio information may be communicated in a plurality of ways as described above including communicating via a cellular communications network to an electronic device operable to receive cellularly communicated signals. For example, the information may be selected from a website operable to display selectable information. Upon selecting the audio information, a data file representing the selected audio information may be wirelessly communicated to an electronic device thereby allowing a user to select audio information via the Internet and wirelessly communicate the information to an electronic device. In some embodiments, the wireless communication to an electronic device may occur in an off-line environment. For example, a user may go "on-line" to access a website and select information and then go "off-line" or end the browsing session. The wireless communication may then occur while the user is off-line thereby removing the confines of using an active or on-line browsing environment (i.e. Internet radio broadcast, streaming audio, etc.) for accessing selected information.

Therefore, the method of FIG. 2 allows for information, such as audio information, to be communicated from a network location such as a web site, to an electronic device via wireless communication. The present invention advantageously allows users to access and download information accessible by a network location to an electronic device operable to receive wireless communications thereby reducing the need for land lines, terrestrial communication networks, etc. for communicating selective information.

In one embodiment, the method of FIG. 2 may be deployed in association with a Internet website operable to display selectable links for downloading information. The information may include audio information such as MP3's, streaming audio, streaming, Internet broadcasts, etc. selectable by a user and operable to be wirelessly communicated to an electronic device. By providing a user with a website of selectable audio information operable to be wirelessly communicated to an electronic device, a user may customize information communicated to an electronic device. In one embodiment, a user may communicate information to an electronic device that may not be owned by the user. For example the method of FIG. 2 could be modified to allow a user to wirelessly communicate audio information to a plurality of electronic devices that may or may not be owned by the user.

FIG. 3 illustrates an electronic device operable to receive selected audio information in accordance with the teachings of the present invention. Electronic device 300 includes a communication module 301 such as a transceiver coupled to storage medium 303 such as a high speed buffer, programmable memory, or other devices operable to store information. Electronic device 300 may also include processor 302 operably associated with communication module 301 and storage medium 303. Processor 302 may be operable to process wirelessly communicated selected information and in one embodiment may be integrated as part of communication module 301 or storage medium 303. In the same manner, as larger scale integration of electronic devices proliferate, communication module 301, processor 302, and storage medium 303 may be integrated into one communication component or device operable as electronic device 300.

Processor 302 may be operable using software that may be stored within storage medium 303. In one embodiment, software upgrades may be communicated to electronic device 300 via wireless communication allowing for efficient system upgrades for electronic device 300. Storage

medium 303 may include one or several different types of storage devices. For example, storage medium 303 may include programmable gate arrays, ROM devices, TRAM devices, EEPROMs, minidisks or other memory devices operable to store information.

During use, electronic device 300 receives wireless communications of selective information. The information may be transmitted via a wireless communications network and received by electronic device 300 via transceiver 301. Transceiver 301 may be operable to convert the received wireless communication signal into a desirable format and store the received information within storage medium 303. The received information may then be processed by electronic device 300.

In one embodiment, electronic device 300 may be operable as an audio player configured to play digital representations of music. For example, electronic device 300 may also include an MP3 player operable to process the received information into an audio signal. Therefore, electronic device 300 may be used to receive wirelessly communicated MP3 audio files and play these files using an MP3 player when desired.

In another embodiment, electronic device 300 may be configured as a PDA wherein the PDA includes a web browser operable to wirelessly communicate with the Internet. The PDA device may include a user interface allowing a user to select information to be wirelessly communicated to electronic device 300. By providing a website of selectable information, the PDA devices may provide an efficient embodiment for electronic device 300 in that it allows a user to access and select information using a wireless communication network and receive the selected information using the same or different wireless communication network.

In yet another embodiment, electronic device 300 may be configured as a component operable to receive selective information via wireless communication and communicate the information to a second electronic device such as an automobile sound system, home stereo, etc. For example, electronic device 300 may utilize transceiver 301 to receive wirelessly communicated information. Electronic device 300 may then be coupled to an automobile sound system using an interface and communicate the received information to the automobile sound system. In this manner, electronic device 300 may be used to provide the automobile sound system with audio files received via wireless communication.

In another embodiment, electronic device 300 may be operable to communicate the received audio information to an audio system via a localized communications signaling network. One such network may include utilizing 'Bluetooth' communication standard used to provide communication between electronic devices in a proximal setting.

In one embodiment, electronic device 300 may be integrated into an audio component such as a radio receiver. Electronic device 300 integrated into an audio component may be configured to process digital audio files wirelessly communicated to an audio component.

In another embodiment, electronic device 300 may be operable to communicate with an analog receiver at a predetermined frequency. For example, a specific frequency may be selected (i.e., 93.7 MHz) for communicating the wireless received selected information from electronic device 300 to a localized audio system. Electronic device 300 communication of the wirelessly received information allows a conventional receiver to receive the selected audio information. In one embodiment, the conventional receiver may be configured to receive a digital sub-carrier, on-carrier,

or other within a specified frequency. Therefore, electronic device 300 may be operable to locally transmit the signal at a specific frequency thereby allowing the conventional receiver to receive the information.

5 In another embodiment, electronic device 300 may be operable to scan plural bandwidths to receive the selective information. For example, transceiver 301 may be operable to receive selective information across several frequencies and process the received information accordingly.

10 In another embodiment, electronic device 300 may be operable to scan several frequencies to obtain the desirable information. For example, a user may select several Internet broadcasts comprised of streaming audio information. Therefore, the information may be transmitted across several wireless frequencies receivable by electronic device 300. Electronic device 300 may then be operable to allow a user to scan wirelessly communicated Internet broadcast signals thereby providing a user selected virtual broadcast radio network.

20 In another embodiment, electronic device 300 may include a user interface operable to communicate with an Internet website operable to display selectable audio information. The Internet website may be configured as a user preferred environment displaying a users selected audio information, Internet broadcast selections, streaming audio selections, etc. With a display device for displaying a Website having selectable information, electronic device 300 may allow a user to select audio information via a user interface and receive the selected information via wireless communication thereby providing a customizable WebRadio device for the user.

In another embodiment, electronic device 300 may be a modular device configured to be coupled to, for example, a portion of a cars interior. For example, electronic device 300 may be mounted to a portion of a car's console thereby providing a removably coupled electronic device operable to wirelessly receive selected audio information. As a removable device, electronic device 300 may be also be coupled to a home audio system, a portable radio system or other systems thereby providing a versatile electronic device operable to receive wirelessly communicated selected audio information.

In another embodiment, electronic device 300 may be operable as a PDA and/or a cellular phone that may be mounted to an automobile's console. Electronic device 300 may then integrate with a user's automobile to provide an all encompassing communications device. For example, electronic device 300 configured as a PDA and cellular phone may allow for communication with a users email account, voice mail account, the Internet, as well as allowing for the receipt of selected audio information via wireless communication. Electronic device 300 may be operable in a hands-free mode allowing a user to maintain safe driving fundamentals. During use, electronic device 300 may be processing selective audio information for communicating with an automobile audio system and may further be operating to receive incoming cellular calls. Electronic device 300 may be set-up by the user to pause the music being played and allow the received cellular call to be communicated either via an independent speaker or utilizing the automobiles audio system. Additionally, electronic device 300 may be operable to adjust the listening level of an automobiles audio system, play received voice mail messages, allow a user to view the Internet, etc.

65 In one embodiment, electronic device 300 may be operable as a dual mode electronic device capable of receiving both digital and analog wireless communication signals. In

this manner, electronic device may efficiently utilize available bandwidth for receiving selected information from a communications engine. For example, transceiver 301 may be a wireless communications modem operable to receive digital or analog signals.

FIG. 4 illustrates a graphical user interface (GUI) for displaying selectable audio information according to one aspect of the present invention. The GUI may be operable with a computer system, cellular device, PDA, or other electronic devices or systems operable to display the GUI of FIG. 4.

The GUI, shown generally at 400, may be displayed using a conventional web browser 402 such as MICROSOFT's INTERNET EXPLORER, a WAP browser, or other browsers operable to display the audio information. Browser 402 includes browser functions, shown collectively at 403, for navigating a network such as the Internet or an intranet. Homepage 401 may be displayed using browser 402 and may include several functions, features, information, etc. related to audio information. Home page 401 may be developed using several different types of programming (i.e., IITML, XML, Java, etc.) used to developing a network location or web-site. The present invention is not limited to any one specific type of software and may be realized in plurality of ways as can be appreciated by those skilled in the art.

Homepage 401 may also include Log-in region 410 allowing a user to log into homepage 401 and display a user preferred environment. For example, a user may want Radio Dial 412 to appear when a user logs into homepage 401. In another embodiment, a user may want to view a current playlist selected by the user or the status of wirelessly communicated playlist. A user may also provide demographic information allowing advertisers to access the demographic information and provide advertisements based upon the demographic information. For example, an advertiser may want to target Hispanic females in the 21-25 year old age group. Through providing demographic information to advertisers, when a user logs into homepage 401 selective advertising can be "targeted" for a group of users.

Homepage 401 may also include several tabs for efficiently navigating homepage 401. Library tab 405 may be provided to allow a user to browse available audio information that may be presented by title, genre, artist, decade, culture, etc. Store tab 407 may also be provided for locating items available for purchase such as CDs, PDA devices, MP3 players, wireless communication hardware, interfaces, software or other types of products that may be purchased while on-line. Chat tab 408 may also be provided allowing a user to chat with other user's of home page 401. For example, a guest musical artist may be available to chat with visitors of home page 401 via chat page associated with chat tab 408. Home page 401 may also include contest tab 409 for displaying current contests, prizes, and/or winners.

Radio tab 406 may also be provided for displaying audio information. For example, radio tab 406 may display a collective menu 411 of selectable functions or features associated with audio information. Top ten lists may be provided to a user based on several different billboard polls or genres. A search engine may be provided allowing a user to search for a specific type of audio information such as an artist, song title, genre, Internet radio station, etc. In one embodiment, a user may input the lyrics to a song within the search engine. As such, the search engine may locate several different songs having the desirable lyrics and allow a user to select the search results. A user may also use a select a device feature that allows a user to select a destination

device for communicating selected audio information. For example, a user may want to communicate a playlist to several different devices such as a PDA, a home computer system, a work computer system, etc. As such, a user can communicate selective information to several devices without having to download the information separately for each device.

A send a friend link may also be provided allowing a user to send selective audio information to a friend's electronic device. A user may also join a group comprised of individuals that select a certain genre of music to be communicated to the user's electronic device. For example, a user may want to join a group that plays only 50's swing music. As such, the user could communicate the group's selected songs to the user's electronic device. A user may also utilize an email account provided by homepage 401 allowing a user to correspond with others via email. A user may also access a list of guest DJ's that may provide playlists of songs chosen by the guest DJ and selectable by a user.

In one embodiment, a user's radio dial 412 may be provided when a registered user logs into homepage 401. As such, radio dial 412 may include several functional buttons similar to conventional systems such as a volume control and a station control. However, radio dial 412 surpasses the limitations of conventional systems through providing a programmable radio dial of user customized audio information. Radio dial 412 includes several stations that may be programmed using program interface 413. The preset stations may include several different types of user customized preset information such as user selected playlists, internet broadcast stations, top 10 lists, group playlists, artist's selected lists, on-line radio station, conventional radio stations, Internet phone, cellular phone, etc. and other functions, features, or information associated with audio information.

Radio dial 412 may also be displayed as a separate user interface and in some embodiments, does not require a 'browsing' environment to view radio dial 412. For example, an electronic device, such as a PDA, having a display may graphically present radio dial 412 to a user. One example may be using electronic device in association with an automobile audio system. Electronic device may display radio dial 412 and may allow a user to navigate, modify, select, adjust volume, access daytimer, access phone lists, etc. or perform other functions while the electronic device is used in association with an automobile sound system. Therefore, radio dial 412 may be operable as an application for use with several different types of electronic devices (i.e., computer systems, portable computing devices, cellular phones, etc.) operable to display radio dial 412 and in come embodiments may be wirelessly communicated to an electronic device.

In another embodiment, homepage 401 may allow a user to select when to download the information to an electronic device. For example, a user may want to listen to a certain genre of music at a specific time of day thereby allowing a user to select the information. As such, a user may select a different playlist for every day of the week thereby allowing a user to listen to different songs on different days of the week. The user can further identify when the selected playlist should be available for listening. For example, if a user wanted to listen to "playlist #1" on Monday morning during the drive into work between 8:00 am and 9:00 am, the user would enter the time and the day playlist #1 would be available for listening. In this manner, the playlist may be



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communicated to the electronic device thereby allowing a user to listen to selective audio information at a desirable time.

FIG. 5A illustrates a portable radio system having a mount for an electronic device according to one embodiment of the present invention. Portable radio 500 includes a mount 501 operable to receive electronic device 502. Mount 501 may include a connector operable to provide communications and power to electronic device 502. During use, electronic device 502 when mounted within portable radio 500 communicates with portable radio to provide remotely received selective audio information.

In one embodiment, electronic device 502 may include a user interface allowing a user to access the Internet. Therefore, selective audio information located on the Internet may be accessed by the user and remotely communicated to electronic device 502 coupled to portable radio 500.

In another embodiment, portable radio 500 may include memory operably located within for storing downloaded information. For example, portable radio 500 may include 32 MB of RAM allowing electronic device 502 to receive selective information and download the selective information to memory located within portable radio 500. In this manner, the downloaded music may be operable to be played within portable radio 500 while allowing electronic device to be removed from portable radio 500.

Therefore, portable radio 500 including electronic device 502 allows a user to communicate selected audio information to portable radio 500.

FIG. 5B illustrates automobile console having a mount for coupling an electronic device according to one aspect of the present invention. Console 510 includes mount 511 operable to receive electronic device 512. Mount 511 may be located in many different locations within an automobile such as coupled to a sun visor, center console, dash board, floor board, etc. Mount 511 allows the user to couple electronic device 512 to the automobile and provide an interface for communication between electronic device 512 and the automobile audio system. Mount 511 may also include a power connection that allows electronic device 512 to use the automobiles power during use. The power connection may also be used in association with a recharging circuit operable to recharge a power supply within the electronic device.

During operation, electronic device 512 coupled to mount 511 may receive selected audio information via wireless communication and communicate the selective information to the automobile audio system. In one embodiment, the automobile may include memory operable associated with the automobile for storing information. The memory may be used in association with mount 511 and electronic device 512 to store the selected audio information. In this manner, voluminous audio information can be stored within the memory allowing electronic device 512 to receive additional information.

In one embodiment, a mount may be provided for a home audio system (not shown) for downloading selected audio information for use with a home audio system. For example, a mount device may be coupled to a home stereo system such that the upon placing an electronic device such as electronic device 500 within the mount, selected audio information may be communicated to the home audio system thereby allowing a home audio system to be used in association with an electronic device.

FIG. 6 illustrates a block diagram of a system for communicating voice mail messages using email according to one embodiment of the present invention. The system, indicated generally at 600, includes email server 601

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coupled to a voice mail storage device 602. System 600 further includes a computer system or network terminal 603 such as a computer coupled to network 604. System 600 further includes mount 605 for mounting electronic device 606 for hardwire communication of information. Device 606 may also communicate with network 604 using a wirelessly communication network operably associated with network 604 and coupled, for example, via tower 607.

During operation, system 600 communicates voice mail messages to a user utilizing email server 601. For example, if a user receives a voice mail message, email server 601 would be notified and a voice mail message would be sent to the user's email account in the form of an email message. For example, a voice mail message would be sent to a user's email account within intranet 604 in the form of an audio file as an attachment to the email. Upon receiving the email, a user may click on the audio file representing the voice mail message to hear the message left by a caller.

In one embodiment, a user may be accessing the Internet via a phone line and, as such, be unable to receive notification that a voice mail message has been received. System 600 would receive the voice mail message and send an email comprising the voice mail message to the user email account. In this manner, a user can remain connected to the network and receive voice mail without having to log off or disconnect from the Internet.

In one embodiment, a user may receive the voice mail message via a portable electronic device. For example, a user may be using remote device 605 operable to receive wirelessly communicated information. System 600 would receive the voice mail message and forward the voice mail message to a user's portable electronic device 606. In this manner, a user may be capable of receiving voice emails at remote locations.

In another embodiment, a user may subscribe to use an Internet email account that may be operably associated with system 600. Utilizing an Internet email account may allow a user the flexibility to check voice email messages from any location in the world. For example, a user may access a "Hotmail" email account while traveling on business in a foreign country. The user, upon gaining access to the "Hotmail" account, would be able to listen to voice mail messages sent to the user via the "Hotmail" email account.

Through utilizing an email account to receive voice mail messages, a user may be afforded great flexibility in communicating voice mail messages. For example, a user may be able to forward a voice mail message received in the form of an email to one or a plurality of other email accounts. In this manner, a voice email message may be sent efficiently to other email users. For example, a user may maintain a distribution list of individuals working on a particular project that may have a need to hear certain voice email messages. In this manner, a user may efficiently disseminate information to other individuals while adding additional textual information to the body of the email allowing a user to comment on the original voice email message.

In another embodiment, a user may forward a received voice email message to another account operable to receive forwarded voice email messages. For example, system 600 may be operable to receive an email message having a voice mail message as an attachment. The system would then be operable to forward the voice mail message to a specified phone number, separate email account, and/or voice mail account, etc. thereby providing a user flexibility in receiving voice email.

In one embodiment, a user may utilize an email account to establish an answering service for voice mails. For

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example, a user's telephone number may be operable with an email account to provide an answering service. A user may record a message for a specified phone number or extension and, upon receiving an incoming call, the recorded message may be played back to incoming call's initiator. System 600 would then forward the received voice email message via an email account to the user. For example, a user may have an account set up at a home residence for receiving voicemail messages via a user defined email account. The user could then forward all received voice mails from the home account to an email account at a place of work. Therefore, the user may have complete access to received voicemail messages. In the same manner, a user could set up their work phone number to forward voice email messages to the users home email account thereby allowing a user to receive voice email at a home email account.

Therefore, system 600 may be operable in a plurality of ways to provide email messages comprised of voicemail messages received via a voice mail or email account.

FIG. 7 illustrates a flow chart for providing voice email messages according to one embodiment of the present invention. The method begins at step 701 where a voice mail message is left for a user. The message could be at a residence, place of business, etc. The method then proceeds to step 702 where the message may be stored as an audio file within a database operable to store a file comprised of the voice mail message. Upon storing the file, the method proceeds to step 703 where an electronic mail message may be generated. The electronic mail message may be addressed to the recipient of the voice mail message. The method then proceeds to step 704 where the audio file representing the voice mail message is attached to the electronic message.

Upon attaching the audio file, the method then proceeds to step 705 where the email message may be sent to the email address. Upon sending the email message the method proceeds to step 706 where the method determines if the email message should be sent to a wireless electronic device. If the message is not to be sent to a wireless device, the method proceeds to step 720 where the method ends. If the message is to be sent to a wireless electronic device, the method proceeds to step 707 where a signal may be sent to the wireless electronic device and at step 708 an indication is provided to the electronic device indicating that a voice email message has been received via a user's email account. The method may then proceed to step 709 where the user decides whether or not to listen to the voice email message. If the user decides not to listen to the voice email message, the method may proceed to step 710 where the method ends. If the user decides to listen to the voice email message, the method proceeds to step 711 where a request may be sent by the electronic device requesting the voice email message be forwarded to the user's electronic device. At step 712, the voice email message may be sent to the user's electronic device. Upon forwarding the voicemail message to the user the method may proceed to step 720 where the method ends.

As such, FIG. 7 depicts one method of providing an email message comprised of a voice mail message. Certainly, other methods may be deployed as advancements in technology are made without departing for the spirit and scope of the present invention.

FIG. 8 illustrates a flow diagram of a method for providing selected audio information to an electronic device according to one embodiment of the present invention. The method begins at step 800 where a user accesses a webpage via the Internet. The webpage may be a home page illustrated in FIG. 4 or other web pages operable to display

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selectable references to audio information. The method proceeds to step 801 where a user selects desirable audio information. For example, a user may select a single song, a plurality different songs, an entire album, a broadcast station, streaming audio, etc. or other selectable audio information. Upon the user selecting a reference to audio information, the method may proceed to step 802 where a playlist may be created that represents the user's selected audio information. The playlist may be variable in size and comprised of a plurality of different types of available audio information. Upon creating a playlist, the method may proceed to step 803 where information associated with the playlist is obtained. For example, a list of network or URL locations comprised of the desirable audio information may be obtained. In this manner, desirable audio information may be obtained from many different sources such as URLs, network addresses, hard drives, databases comprised of audio information, etc. The sources may be accessed to obtain the selected audio information.

Upon obtaining data associated with the customized playlist, the method may proceed to step 804 where the user is prompted for a destination for the playlist. For example, a user may want to communicate the selected audio information to a remote electronic device, a automobile audio system, a home stereo system, a home computer, an electronic device coupled to a home network or computer system, etc. or other locations or devices operable to receive the selected audio information. In one embodiment, a user may select a device owned by a friend to accept the selected audio information. For example, a husband may want to send a romantic playlist to his wife on their anniversary. In this situation, the husband would select his wife's electronic device as the receiving device for the selected audio information.

Upon selecting a device, the method proceeds to step 805 where the method determines the destination of the selected audio information. If the information is to be sent to a device via a wire line connection, the method proceeds to step 813 where playlist data is sent to a user via a wire line connection. The method may then proceed to step 814 where the playlist is executed at the device. If the information is to be sent to a device requiring wireless communication, the method proceeds to step 806 where the information is formatted for communicating the information to a wireless electronic device. For example, a wireless PDA device may be selected as a destination device for the selected audio information. The PDA device may include an audio player, such as an MP3 player operable to play or execute MP3 audio files. In such an embodiment, the method could format the information such that the information may be wirelessly communicated and subsequently played by the MP3 player.

Upon formatting the information, the method may then proceed to step 807 where the audio information is wirelessly communicated to the selected device. In some embodiments, the device may be operable to receive a limited amount of information based upon storage capacity of the device (i.e., 16 Megabytes). In such a case, the method may divide the information into component parts and periodically communicate the component parts, such as packets, to the electronic device. Upon communicating the audio information, the method may then proceed to step 808 where the signal may be received by the destination or electronic device. The method may then proceed to step 809 where the method determines if all of the audio information has been received. For example, if 16 Mbytes or 32 Mbytes of selected audio information was initially transmitted due to capacity limitations of the selected device, the method may

query the selected device to determine if capacity is available. If available memory exists, the method may proceed to step 807 where the method may communicate additional audio information based upon the amount of available memory. The method repeats until all of the selected audio information has been transmitted.

Upon communicating the selected information, the method may proceed to step 810 where the playlist may be executed at step 812. For example, a user may select a continuous communication of selected audio information (e.g. several hours of music, Internet broadcast, etc.). As such, the method may continuously play or execute the received audio information. In another embodiment, the method may proceed to step 811 where the method may store or buffer the received information until it is desirable to execute the received selected audio information. As such, upon executing the selected audio information, the method may proceed to step 809 where the method may repeat.

In one embodiment, a user may elect to download a broadcast of an on-line radio station. For example, a user may want to listen to a radio station located in a remote location wherein conventional radio receivers could not receive the desired broadcast. For example, a person living in Houston, Tex. may not be able to receive a radio broadcast signal from a radio station in Seattle, Wash. utilizing a conventional radio receiver. In accordance with the teachings of the present invention, a user may select an on-line broadcast or radio station as all or a part of the selected audio information. The user may then receive radio broadcasts without having to use a home computer system or conventional radio receiver.

At step 804, a user may select a device that does not require remote communication of information. For example, a user may elect to communicate the selected audio information to device, such as a personal computer, PDA device, MP3 player, etc. coupled via a network connection to the Internet or an Intranet. The user may receive the selected playlist at the determined device for eventual playing. In one embodiment, a user may select a plurality of devices as destination devices for receiving downloads of the selected audio information. For example, the user may want to download the information to a home stereo system, a PDA device, and an automobile stereo. As such, the selected information may be communicated to more than one destination device. In addition, the format of the download may match or conform to the selected destination device(s).

The present invention may be configured in a plurality of ways to communicate desirable audio information to users by allowing users to select desirable audio information and transmitting the desirable audio information to a specified destination thereby allowing a user to receive on-demand customized audio information. Moreover, the download may occur in an off-line environment, allowing a user to enjoy the selected audio information accessed on-line without having to be on-line or utilizing a browsing environment.

In one embodiment of the present invention, the method of FIG. 8 may be modified to allow a user to select a "user group" for receiving customized audio information. For example, a "user group" may include user's that only like to listen to contemporary jazz wherein a user may request a certain song. Therefore, a virtual request line may be created for a specific genre of music allowing "members" to transmit audio information to the "group".

In another embodiment of the present invention, the method may be modified to allow a user to select a specific genre to be transmitted to the users device. For example, a user may elect to have random country and western music

transmitted to a destination device. The user could efficiently create a radio station format and have the format received at a destination device.

In a further embodiment, a user may select a group of genres to be downloaded to a desirable device. As such, the method may be modified to allow a user to select several different genres to download random music within the specified genres.

In another embodiment, a user may elect to download the same music as another individual. For example, a user may want to download the same music as their best friend. Therefore the user could elect to download the same music as their friend or group of friends. In another example, a user may want to listen to the same music that an artist listens to on a specific weekday of evening. For example, a user may want to listen to the same music that Barry White listens to on a Saturday night. Therefore, the user may select "Barry White's" Saturday night playlist and receive the same playlist Barry White receives on Saturday night.

In another embodiment, the method of FIG. 8 may be modified to allow a user to manipulate songs post download. For example, a user may want to store, delete, replay, copy, forward, etc. received audio information. Therefore, the method of FIG. 4 may be modified such that a user can manipulate or process the received audio information in a plurality of ways.

In one embodiment of the present invention, an on-line radio station may be provided. For example, the radio station may be created for transmitting audio or on-line broadcasts. The on-line broadcaster's or hosts may create their own format for broadcast. For example, an on-line radio station may be provided that transmits only children's songs. Prior to conception of the present invention, conventional radio stations could not afford to transmit music such as children's songs to conventional radio receivers. The present invention, by providing a medium for transmitting selectable audio information, enables the existence of on-line broadcasting with little or no overhead for a host. A user may select an on-line broadcast for on-line or off-line delivery.

In another embodiment, on-line broadcast of audio information representing books or novels may be provided to individuals such as the visually impaired. For example, an on-line broadcast station may provide several hours of audio information broadcast representing books or novels to be broadcast with very little overhead.

FIG. 9 illustrates an automobile console having a mount for an electronic device according to one embodiment of the present invention. Console 900 includes a conventional audio system 901 comprised of a receiver 902 and CD player 903. Interface 904 may be coupled to audio system 901 via plug 905 and cable 908, which may be coupled to an auxiliary line into audio system 901. Interface 904 may also include contact 906 for contacting electronic device 907. Cable 908 may be a multiple conductive cable for providing power from the automobiles power system via a protection circuit or fuse 909 for powering electronic device 907. In one embodiment, interface 904 may be operable to recharge electronic device 907 utilizing a power source associated with an automobile.

During operation, electronic device 907 may be mounted within interface 904. Electronic device 907 may also be powered or recharged via power line 910 and communicate with the systems audio system via interface cable or bus line 911. Audio information communicated to electronic device 907 may be transferred to audio system 901 such that a user may listen to selected audio information. For example, a user may have previously selected a plurality of audio files

to be transmitted to electronic device 907. Electronic device 905 may communicate the selected audio information to the automobiles audio system utilizing interface 901 thereby allowing the user to listen to selected audio information. In one embodiment, cable 908 may be custom installed to an auxiliary line for the system's radio or may be coupled to a CD player line 912. In another embodiment, a radio manufacturer may provide interface 904 as a standard interface integrated into the audio system thereby allowing communication between electronic device 907, audio system 901 and/or console 900.

Electronic device 907 may include a plurality of different types of devices. For example, electronic device 907 may include a PDA device operable to store selected audio information. The information may be either remotely downloaded using an Internet web browser and wireless communication to the PDA device. In another embodiment, selected audio information may be communicated to a PDA device via a hard wire coupled to a computer system interfacing with the Internet.

In another embodiment, electronic device 907 may include an audio file player operable to play audio files such as MP3's, etc. The audio files may be remotely or locally communicated to electronic device 907 and upon coupling to audio system 901, the audio files may be transmitted to audio system 901 in a form receivable by audio system 901.

Although the disclosed embodiments have been described in detail, it should be understood that various changes, substitutions and alterations can be made to the embodiments without departing from their spirit and scope.

What is claimed is:

1. A cellular communication device comprising:
  - a cellular communication module configured to receive an incoming telephonic communication;
  - a memory module configured to store audio information received via a cellular communication network independent of the incoming telephonic communication;
  - a processor communicatively coupled to the memory module and configured to process the audio information and to output a digital representation of the audio information;
  - a local rechargeable battery configured to provide power to the processor; and
  - an interface configured to releasably engage with a docking mechanism of a separate sound system such that:
    - (1) a power supply of the separate sound system can recharge the local rechargeable battery via the interface;
    - (2) the digital representation can be communicated to the separate sound system via the interface;
    - and (3) a control signal of the cellular communication device can alter an operational parameter of the separate sound system in response to the incoming telephonic communication.
2. The device of claim 1, wherein the operational parameter is a volume level further comprising the processor operable to stop playing of the audio file in response to the incoming telephonic communication.
3. The device of claim 1 further comprising the processor configured to enable a user to alter the processing of the audio information to answer the incoming telephonic communication.
4. The device of claim 1,
  - wherein the audio information comprises plural audio files; and
  - wherein the processor is configured to enable sequential playing of plural audio files.

5. The device of claim 4, wherein the processor is configured to first play a WAV file and second play an MP3 file.

6. The device of claim 1, wherein the memory is configured as a buffer and the audio information is a wirelessly streamed version of an on-line radio broadcast.

7. The device of claim 6, wherein the wirelessly streamed version of the on-line radio broadcast is received via a GSM network.

8. The device of claim 1, wherein the audio information includes streaming audio information.

9. The device of claim 1, further comprising the processor being configured to pause output of the digital representation of the audio information in connection with the incoming telephonic communication.

10. The device of claim 9, further comprising the processor being configured to enable a user to elect to answer and listen to a telephone call in response to the incoming telephonic communication, wherein the telephone call is not listened to via the separate sound system.

11. The device of claim 1, further comprising the processor being configured to enable a user to elect to answer and listen to a telephone call in response to the incoming telephonic communication, further wherein the interface is configured to allow the user to listen to the telephone call from the separate sound system.

12. The device of claim 11, wherein a PDA comprises the cellular communication module, the processor, the memory module, the local rechargeable battery, and the interface.

13. The device of claim 1, wherein a cellular telephone comprises the cellular communication module, the processor, the memory module, the local rechargeable battery, and the interface.

14. The device of claim 1, further comprising a WAP browser configured to accept the audio information.

15. The device of claim 13, further comprising the communication module being configured to receive an audio file selected via an Internet website accessed external to the cellular communication device.

16. The device of claim 14, further comprising a media player configured to play user selected media wirelessly downloaded outside of a web browsing environment.

17. A cellular communication device comprising:
 

- a processor configured to play plural audio information formats;
- a communication module configured to receive a wirelessly communicated collection of digital data packets representing a user selected media having a first audio information format;
- a display configured to present a user interface that comprises an icon representing a locally stored audio file;
- an updateable user interface engine configured to accept an over the air download of an updated user interface file and to utilize the updated user interface file to initiate presentation of a different user interface on the display, wherein the different user interface comprises a new icon representing the user selected media;
- a memory operable to store plural audio information formats; and
- a Bluetooth communication module communicatively coupled to the processor such that a played audio information format can be communicated to a wireless speaker.

18. The device of claim 17, further comprising:
 

- output means for providing an audio output;
- input means for selecting the audio file; and

browsing means for viewing available preformatted audio and media files.

19. The device of claim 17, further comprising a removable memory device operable to store at least one audio file.

20. A method for managing audio outputs for a cellular communication device comprising:

generating a user interface file that can be processed to present a user interface on a cellular device, wherein the user interface comprises an icon linked to a selected audio information source;

initiating an over the air download of the user interface file;

communicating the user interface file to the cellular telephone via a wide area wireless network;

processing the user interface file to present the user interface on the cellular device;

initiating a playing of audio information by selecting the icon;

detecting an incoming cellular telephone call; and altering playing of the audio information in connection with a detecting of the cellular telephone call.

21. The method of claim 20, further comprising playing a second audio file stored within a memory of the cellular device.

22. The method of claim 21, further comprising: receiving the second audio file independent of the incoming cellular telephone call;

storing the second audio file within the memory; and playing the second audio file after detecting the incoming cellular telephone call.

23. The method of claim 20, further comprising playing a second audio file received via a non-wireless communication network.

24. The method of claim 20, further comprising: enabling access to a streaming media source in response to a selection of the icon;

detecting selection of the icon; and receiving a wirelessly communicated collection of data packets representing a media stream output by the streaming media source.

25. The method of claim 24, further comprising playing the wirelessly communicated collection of data packets in order to present the media stream; and altering the playing in response to receiving the cellular telephone call.

26. The method of claim 24, further comprising outputting a playing of the wirelessly communicated collection of data packets such that the media stream is presented via an automobile entertainment system.

27. The method of claim 24, wherein the media stream comprises a video stream.

28. The method of claim 24, wherein the media stream comprises streaming audio.

29. A wireless communication system comprising: an Internet website provided in association with a cellular communication device configured to receive and play audio information, the Internet website configured to present a user with an application that allows the user to create a user interface for the cellular communication device;

a wireless communication network configured to communicate a launchable interface file to the cellular communication device such that the user interface is presented on a display of the cellular communication device;

a wireless network element configured to receive a signal indicating that the user has selected an icon on the user interface and to initiate wireless communication of data packets to the cellular communication in response to the signal; and

a digital engine operable to determine availability of the cellular communication device and to communicate the data packets to the cellular communication device.

30. The system of claim 29, further comprising the Internet website being configured to present a user login page and to link a particular user to a particular cellular communication device.

31. The system of claim 30, further comprising the Internet website being configured to provide access to downloadable software that can be wirelessly communicated to the cellular communication device.

32. The system of claim 29, further comprising the cellular communication device, wherein the cellular communication device is configured to alter playing of the audio file in response to receiving a telephone communication communicated via the wireless communication network.

33. The system of claim 29, further comprising the Internet website presenting a link to a selectable preformatted audio file operable to be communicated to an identified cellular communication device.

34. The system of claim 29, wherein the user interface includes a list of selectable categories, wherein the list of selectable categories includes at least two of:

genre;  
artist;  
most popular;  
newest;  
most viewed; and  
favorites.

35. The system of claim 29, further comprising the digital engine being configured to communicate data packets that represent streaming audio information.

36. The system of claim 35 further comprising the digital engine being configured to communicate data packets that represent streaming video information.

37. The system of claim 30, wherein the audio file may be communicated to the wireless communication device independent of a user being logged into the Internet website.

38. The system of claim 29, further comprising the user interface being configured to enable access to a WAP enabled Internet website that is communicatively coupled to the digital engine.

39. The system of claim 29, further comprising the digital engine being configured to provide access to a broadcast.

40. The system of claim 39, further comprising the digital engine being configured to provide access to an on-line video broadcast.

41. The system of claim 39, further comprising the digital engine being configured to provide access to an on-line radio broadcast.

42. The system of claim 39, wherein the cellular communication device is configured to alter playing of an accessed broadcast in response to an incoming cellular telephone call.

# **EXHIBIT 16**



US006587127B1

(12) **United States Patent**  
Leeke et al.

(10) **Patent No.:** US 6,587,127 B1  
(45) **Date of Patent:** \*Jul. 1, 2003

(54) **CONTENT PLAYER METHOD AND SERVER WITH USER PROFILE**

(56) **References Cited**

(75) **Inventors:** Steven D. Leeke, Rolling Meadows, IL (US); Gregory B. Mackintosh, Naperville, IL (US); Edward Stojakovic, Chicago, IL (US)

(73) **Assignee:** Motorola, Inc., Schaumburg, IL (US)

(\*) **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** 09/198,732

(22) **Filed:** Nov. 24, 1998

(Under 37 CFR 1.47)

**Related U.S. Application Data**

(63) **Continuation-in-part** of application No. 08/976,971, filed on Nov. 25, 1997, now abandoned.

(51) **Int. Cl.<sup>7</sup>** ..... G06F 3/00

(52) **U.S. Cl.** ..... 345/765; 345/733; 345/747; 345/764

(58) **Field of Search** ..... 345/700, 716, 345/733, 742, 744, 745, 747, 762, 764, 765, 866, 961, 962, 978; 707/500.1

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*Primary Examiner*—John Cabeca

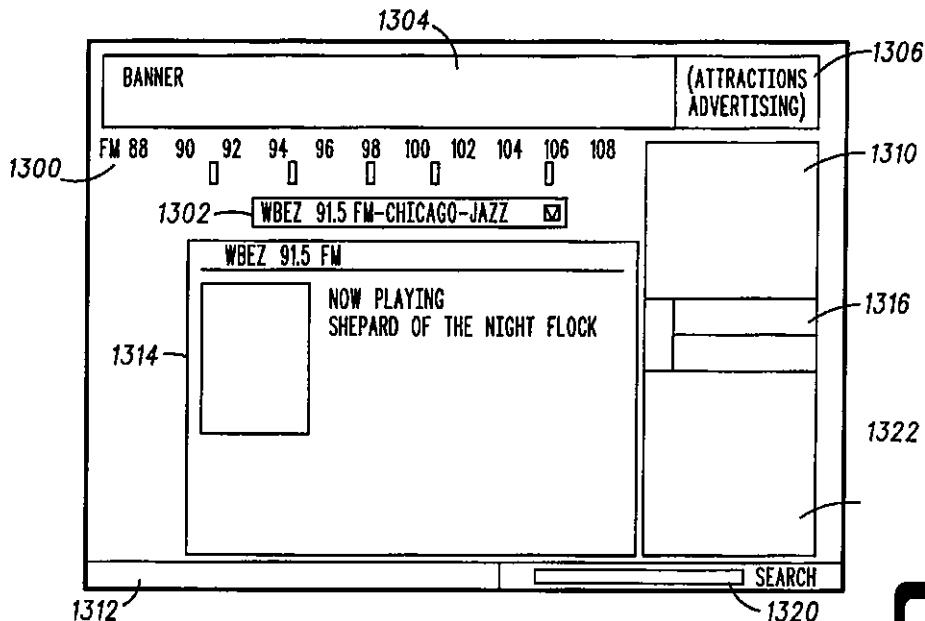
*Assistant Examiner*—X. L. Bautista

(74) *Attorney, Agent, or Firm*—James E. Gauger; Hisashi D. Watanabe

(57) **ABSTRACT**

A method of operation of a server (102) interacting with users (104, 106) to provide personalized content to each of the users. Personalized content is sent to a first user by communicating first audio or other content associated with a broadcast to a first user location. Second content is selected and a first signal is communicated to the first user location dependent on the user profile. The second content can include second audio content selected in dependence upon the first user profile, in which case playback of the second audio content is synchronized with respect to playback of the first audio content.

**20 Claims, 33 Drawing Sheets**



**EXHIBIT**  
 Bove 16  
 5/30/14 DHE

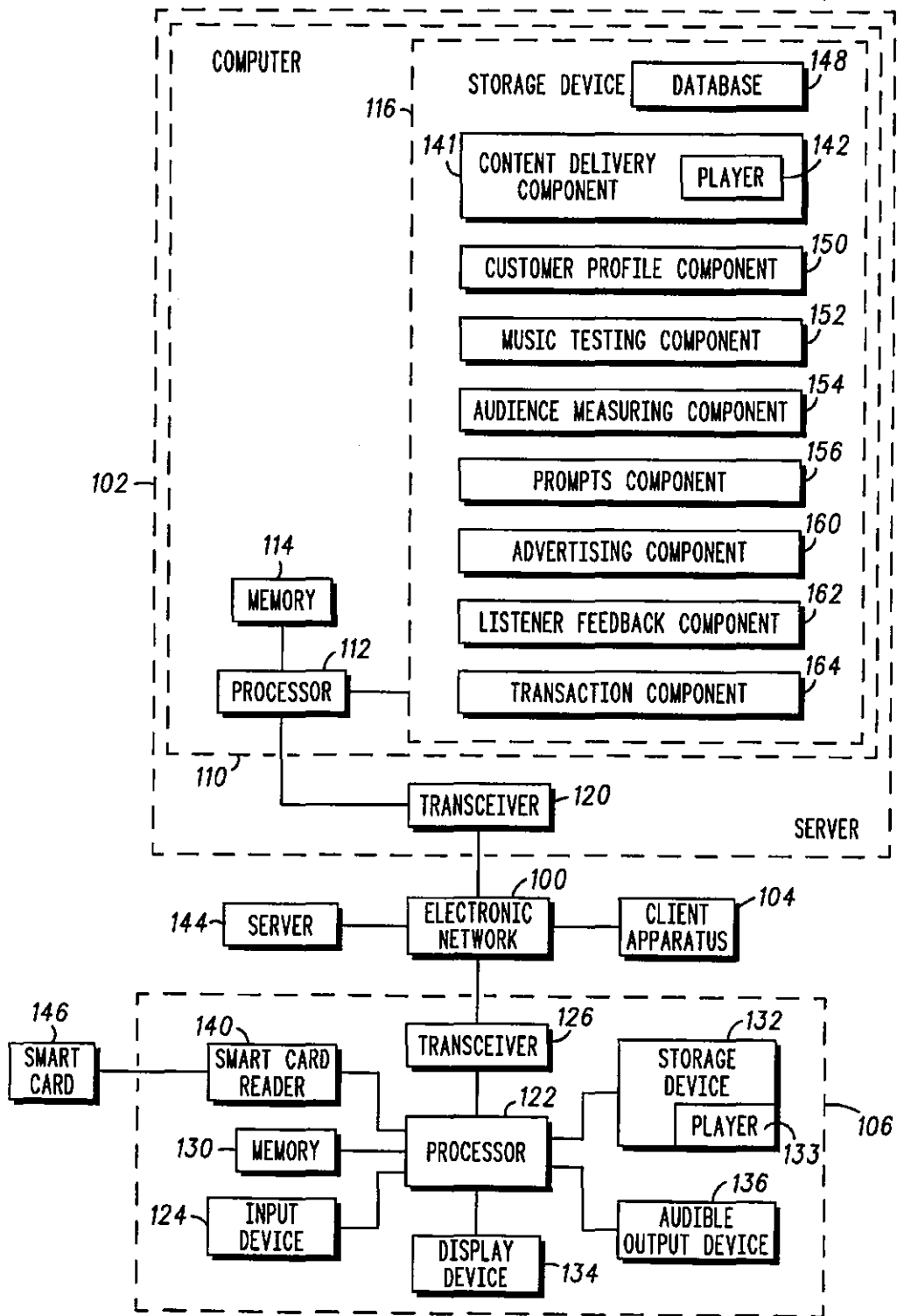


FIG. 1



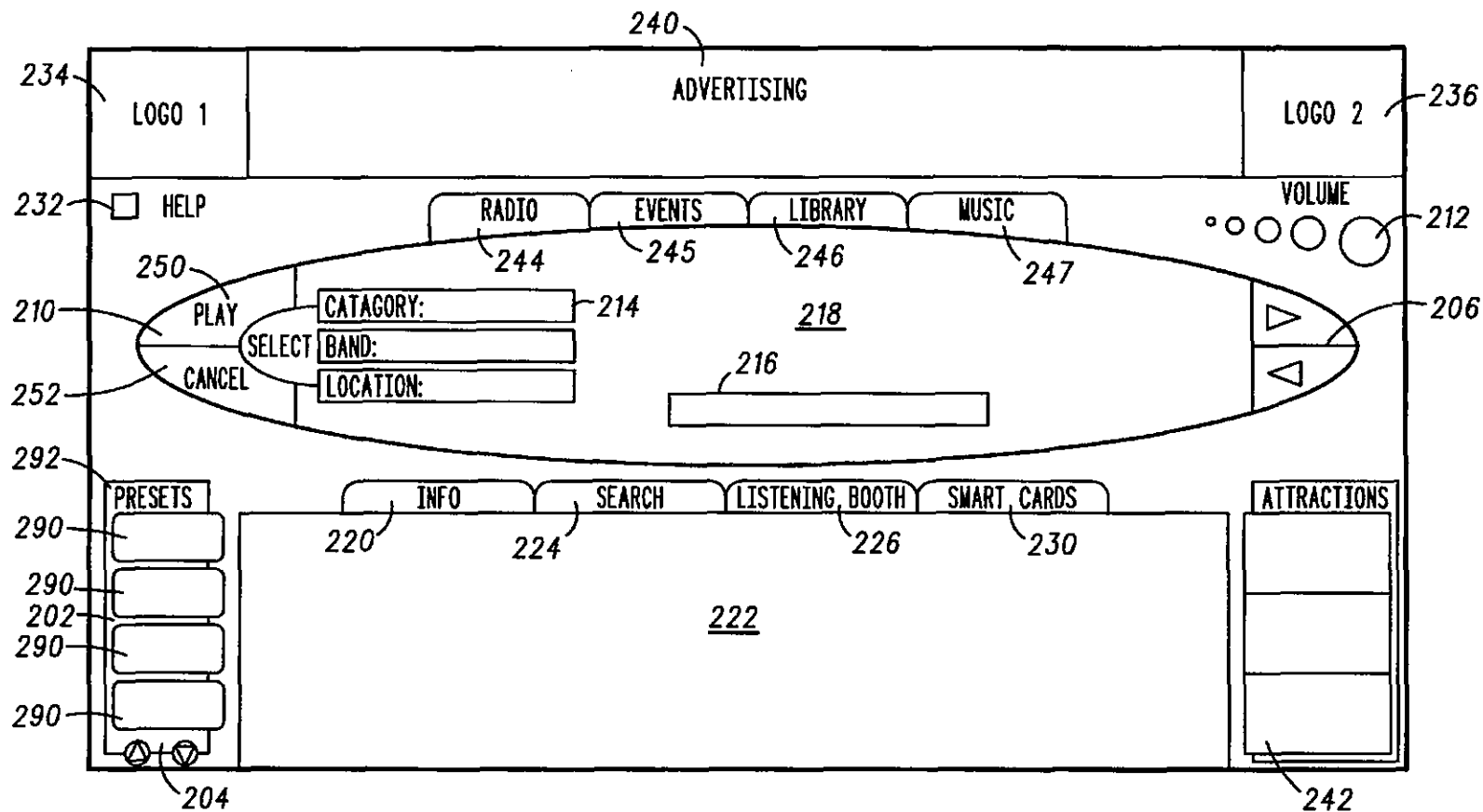


FIG. 2

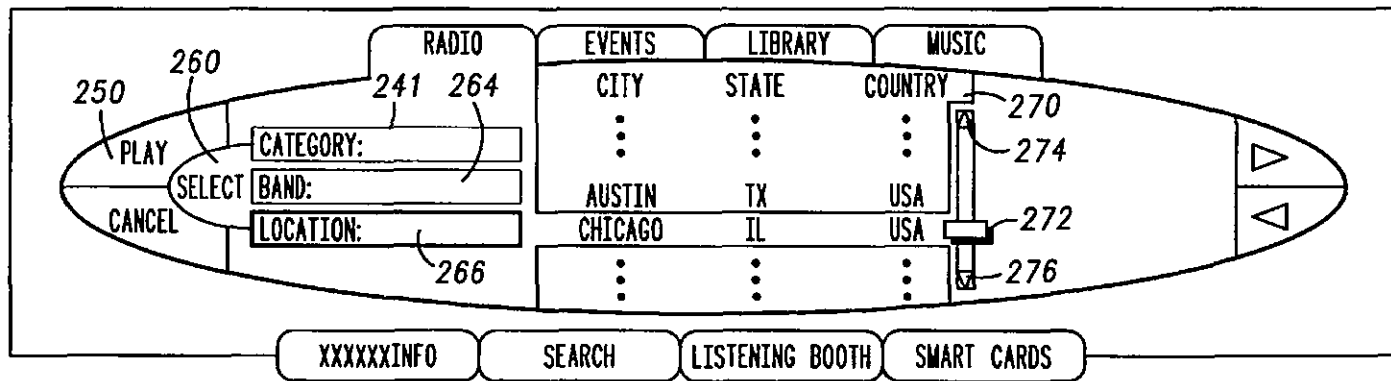


FIG. 3

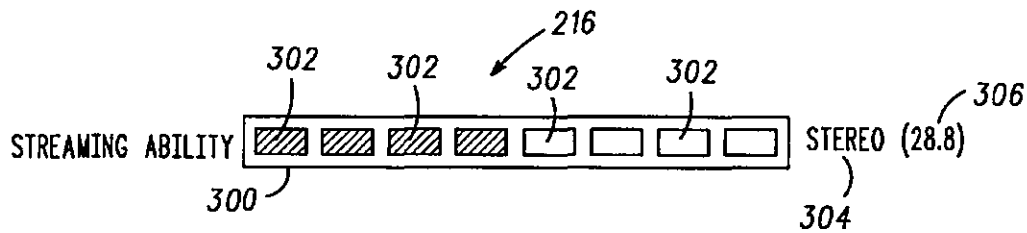


FIG. 4

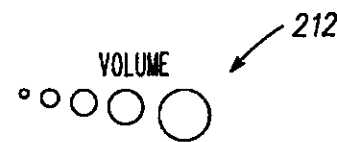


FIG. 5

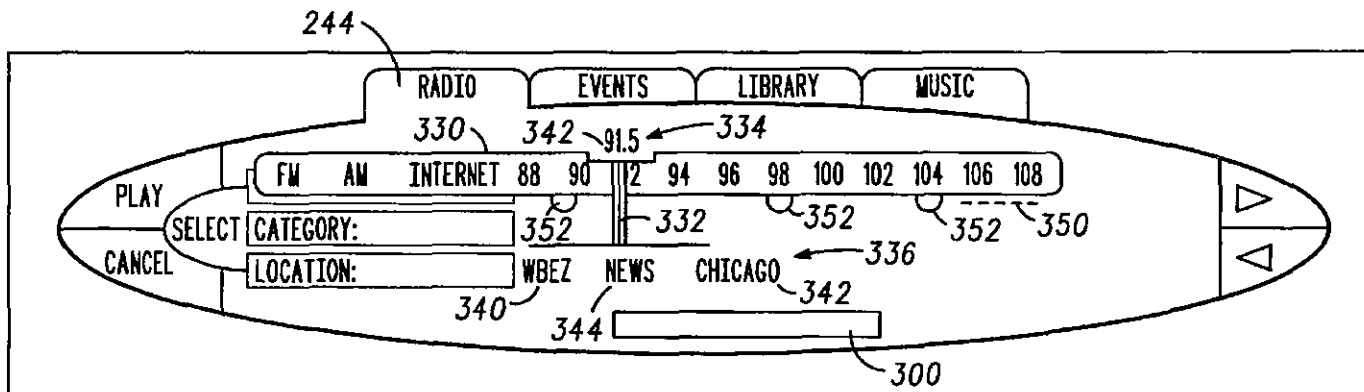


FIG. 6

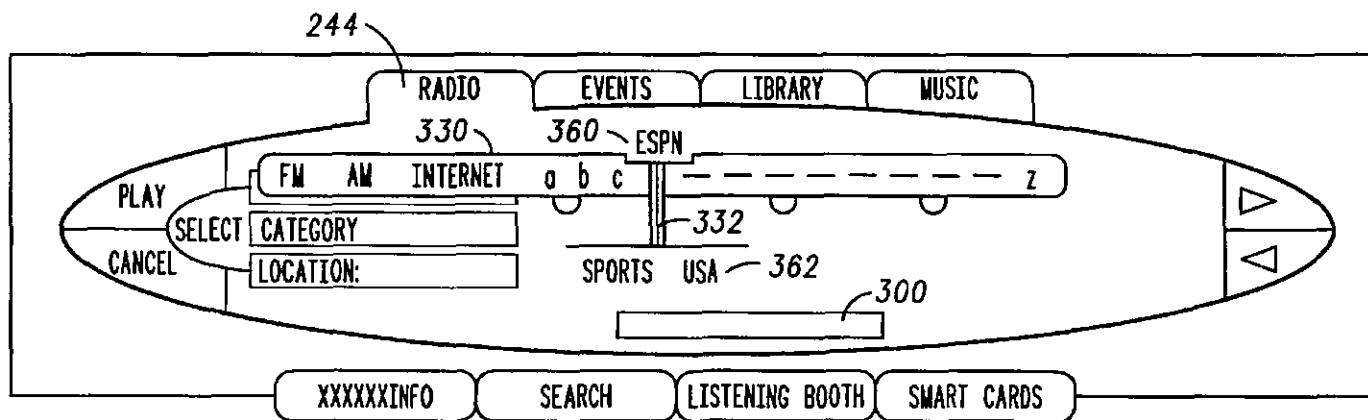
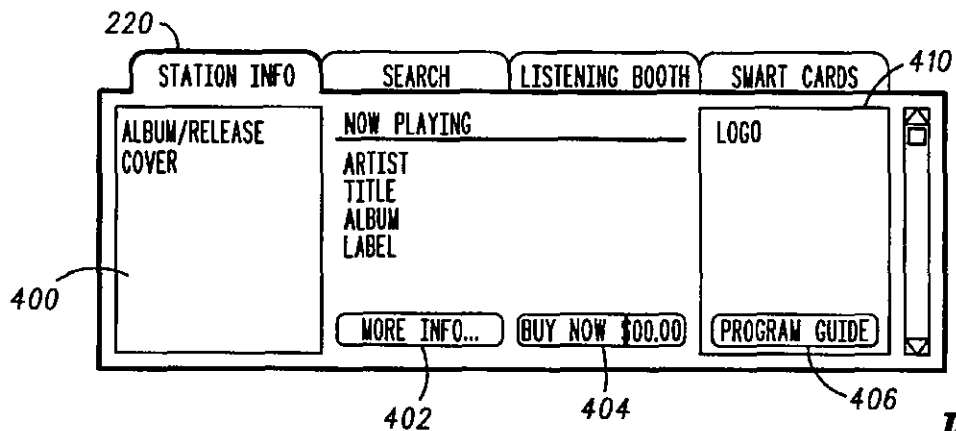
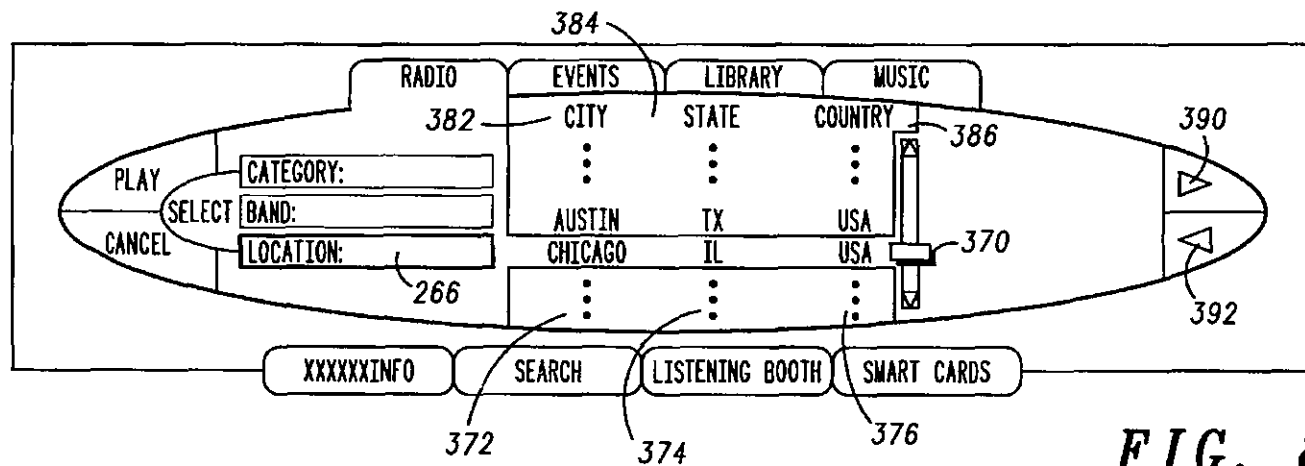


FIG. 7



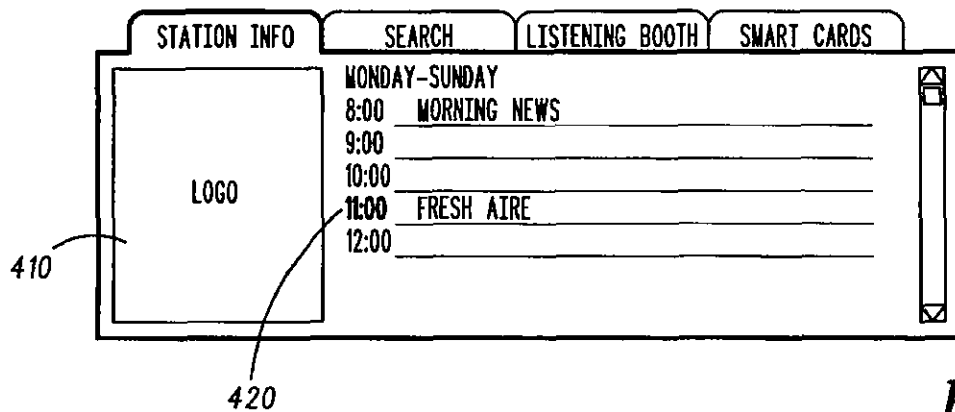


FIG. 10

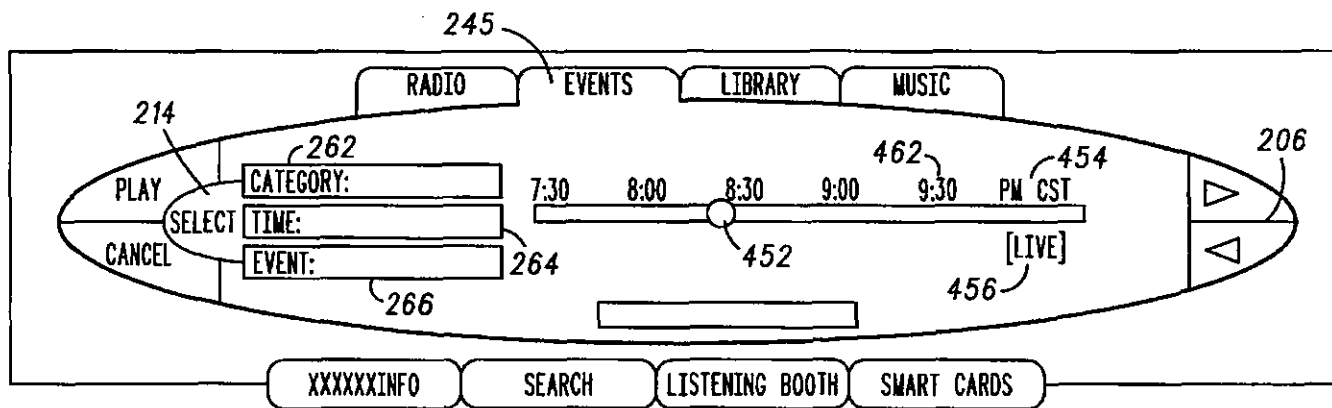


FIG. 11

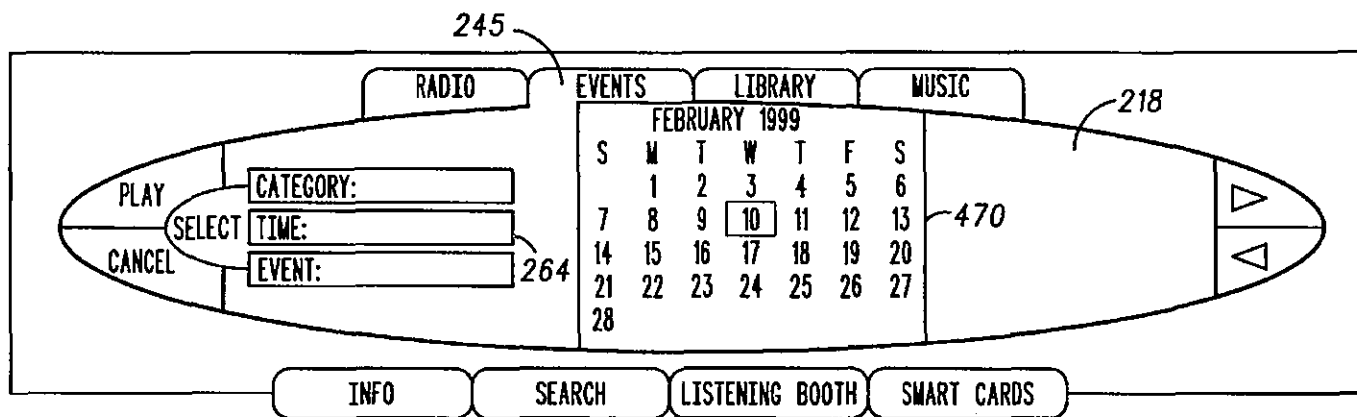


FIG. 12

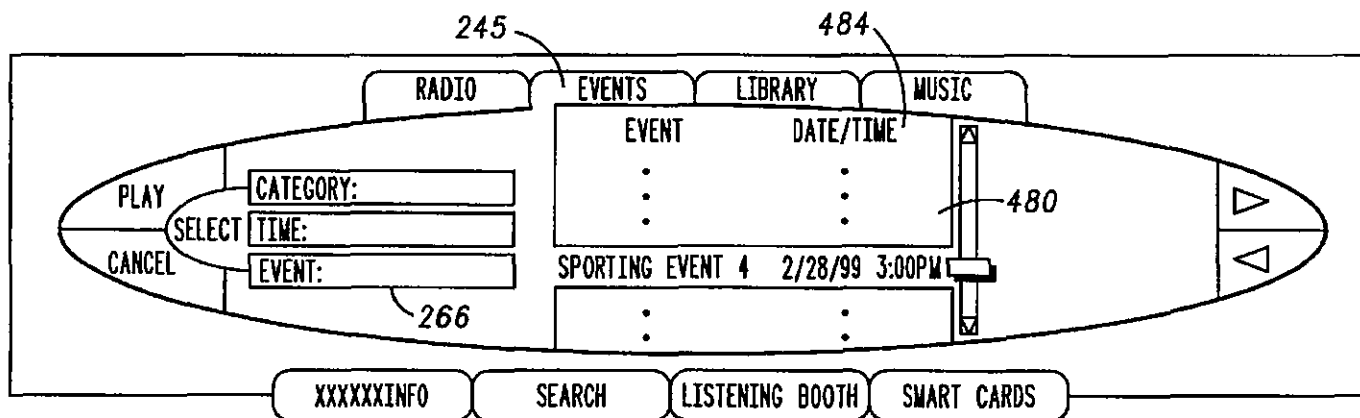


FIG. 13

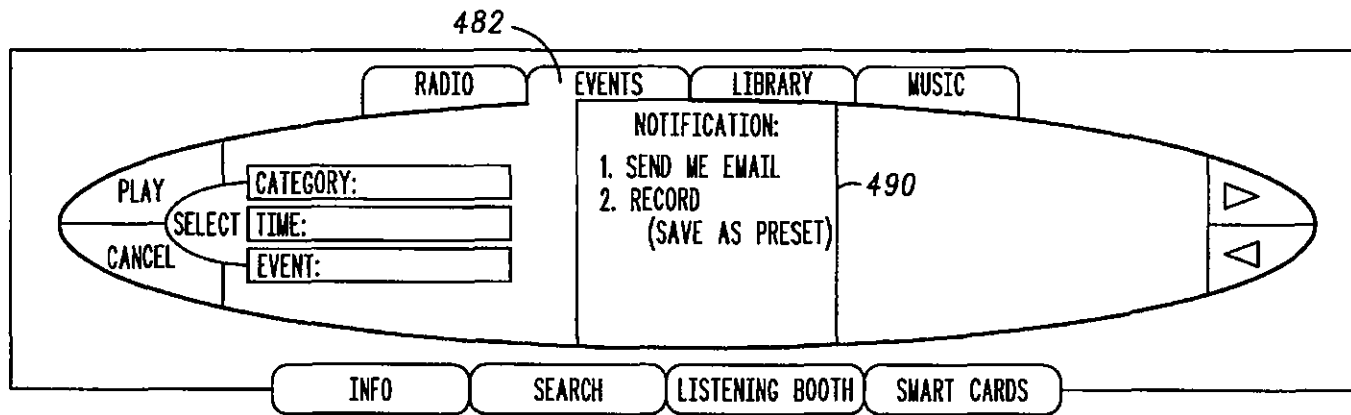


FIG. 14

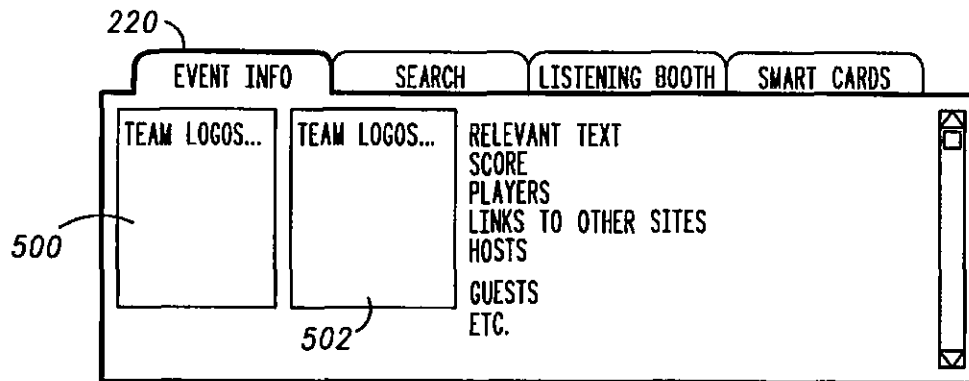


FIG. 15

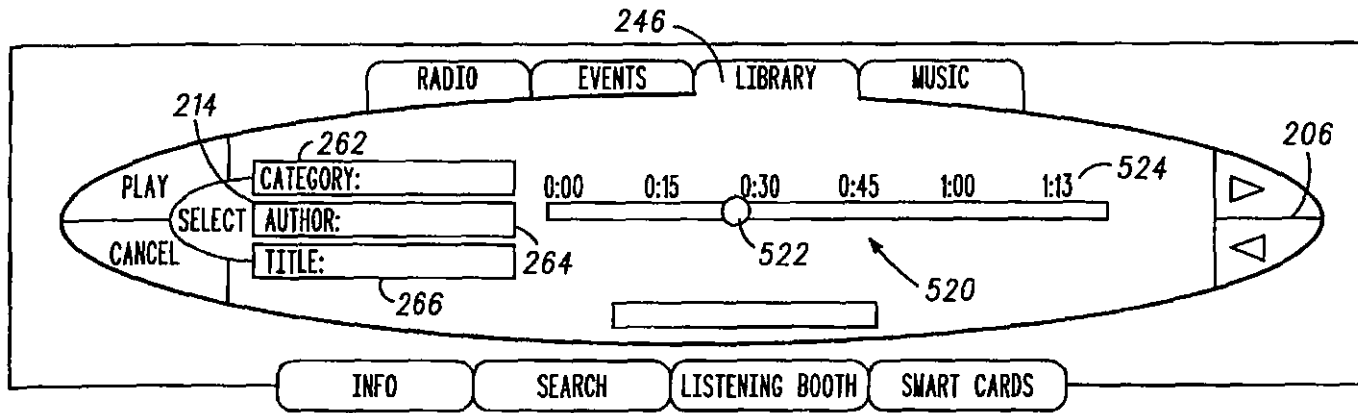


FIG. 16

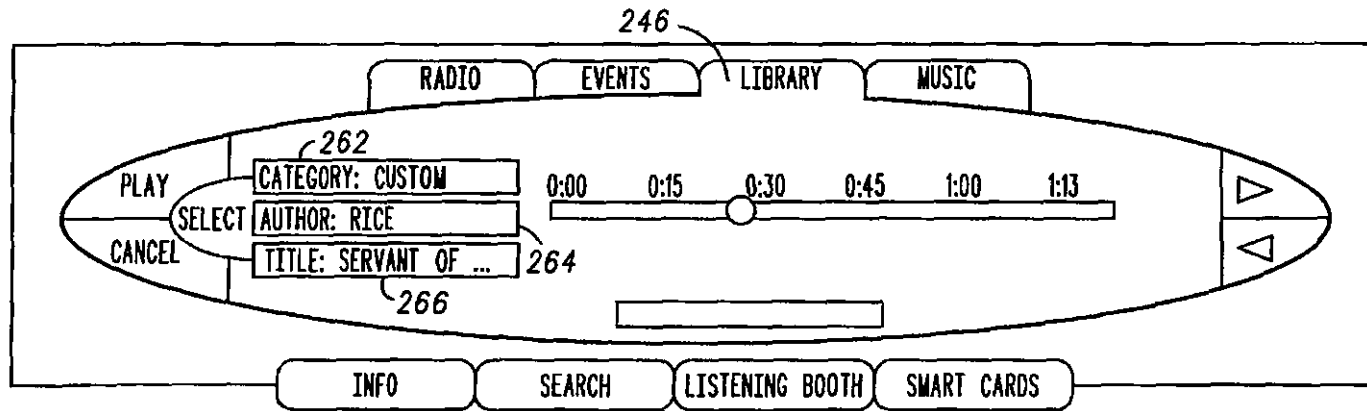


FIG. 17



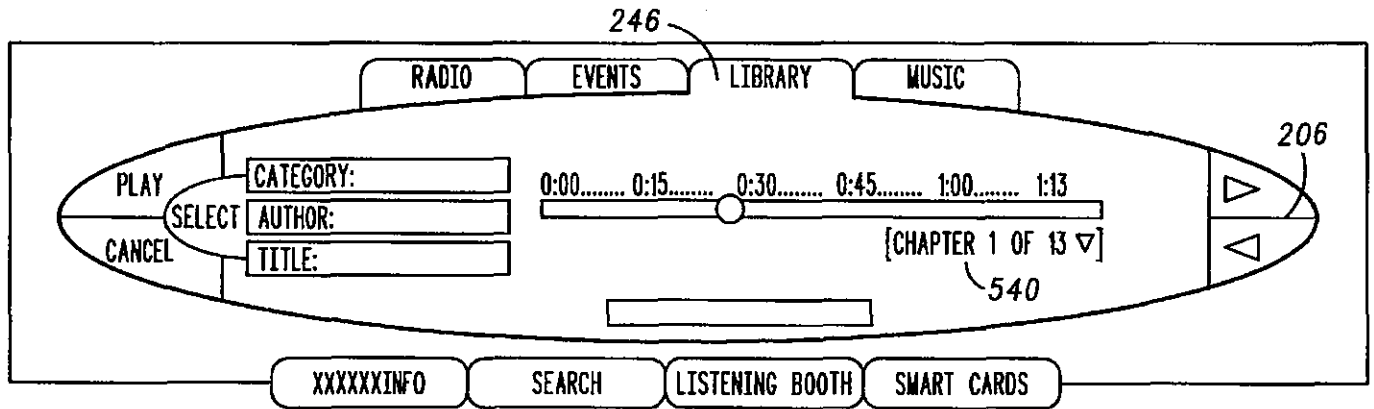


FIG. 18

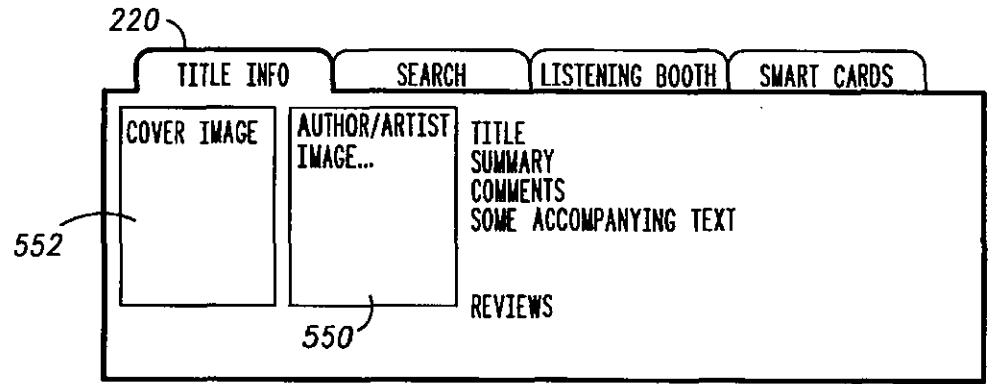


FIG. 19

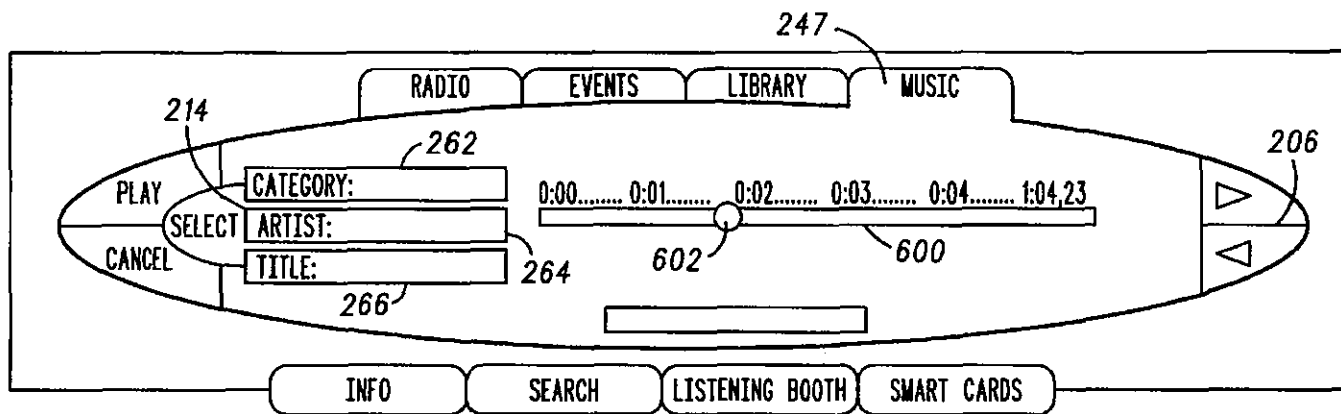


FIG. 20

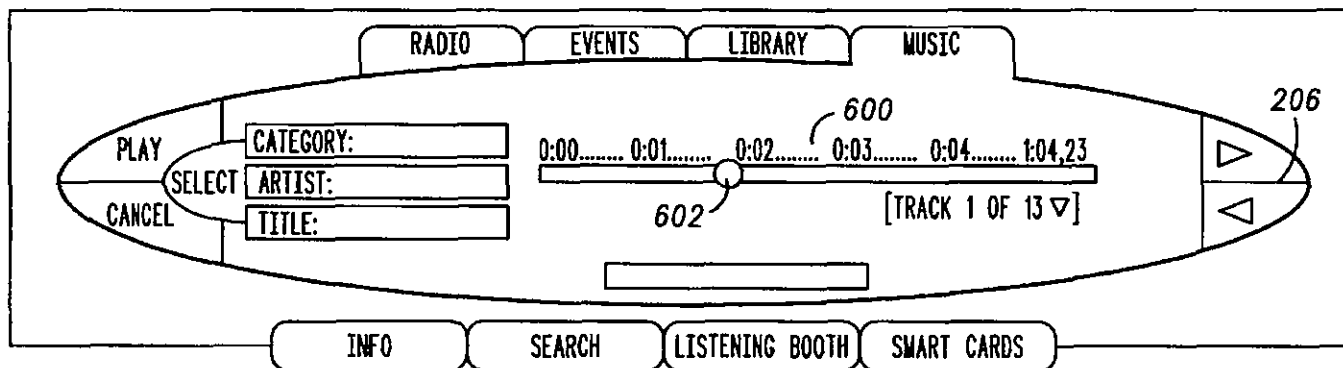


FIG. 21

630 224

STATION INFO SEARCH LISTENING BOOTH SMART CARDS

KEYWORD: \_\_\_\_\_ FIND IT! 636

SEARCH IN:

<input checked="" type="checkbox"/> RADIO	<input checked="" type="checkbox"/> EVENTS	<input checked="" type="checkbox"/> LIBRARY	<input checked="" type="checkbox"/> MUSIC
<input checked="" type="checkbox"/> CATEGORY	<input checked="" type="checkbox"/> CATEGORY	<input checked="" type="checkbox"/> CATEGORY	<input checked="" type="checkbox"/> CATEGORY
<input checked="" type="checkbox"/> BAND	<input checked="" type="checkbox"/> TIME	<input checked="" type="checkbox"/> AUTHOR	<input checked="" type="checkbox"/> ARTIST
<input checked="" type="checkbox"/> LOCATION	<input checked="" type="checkbox"/> EVENT	<input checked="" type="checkbox"/> TITLE	<input checked="" type="checkbox"/> ALBUM
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> PRODUCER

632 MORE CHOICES 634 FEWER CHOICES

FIG. 22

224

STATION INFO SEARCH LISTENING BOOTH SMART CARDS

SEARCH RESULTS FOR KEYWORD \_\_\_\_\_

RADIO	_____	_____
CATEGORY	BAND	LOCATION
EVENTS	_____	_____
CATEGORY	TIME	EVENT
LIBRARY	_____	_____
CATEGORY	AUTHOR	TITLE
MUSIC	_____	_____
CATEGORY	ARTISI	ALBUM

640 PREVIOUS SEARCH 642 NEW SEARCH

FIG. 23

226

STATION INFO SEARCH LISTENING BOOTH SMART CARDS

WELCOME TO THE LISTENING BOOTH WHERE YOU GET TO HEAR THE  
UPCOMING STARS FIRST AND RECEIVE THEIR ALBUMS  
TO READ DIRECTIONS, CLICK TELL ME MORE, OYHERWISE LOGIN AND CONTINUE.

650 TELL ME MORE

ONLY 6 MORE ALBUMS TO SAMPLE TO RECEIVE YOUR FREE ALBUM!  
LAST ACCESSED: 5 FEBRUARY 1999  
NAME: ED STONE  
PASSWORD: \_\_\_\_\_

REVIEW MY RATINGS SO FAR 690

FIG. 24

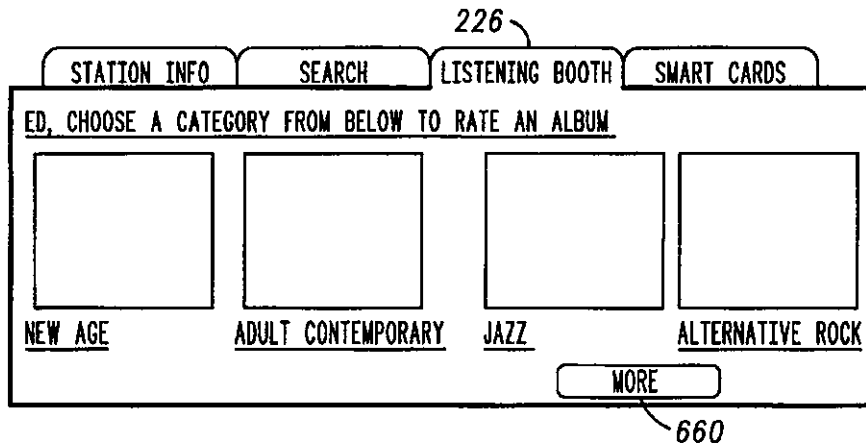


FIG. 25

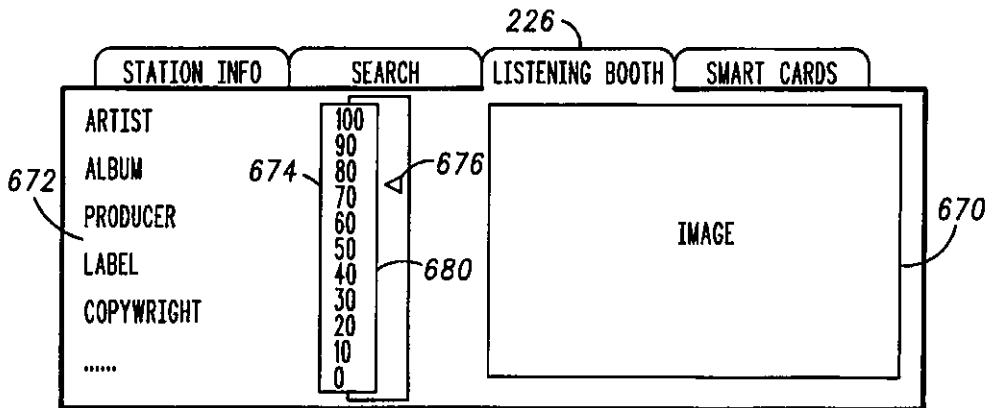


FIG. 26

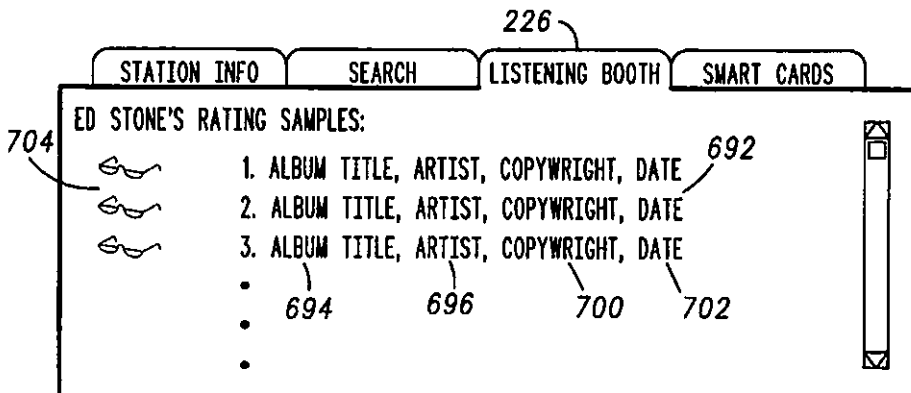


FIG. 27

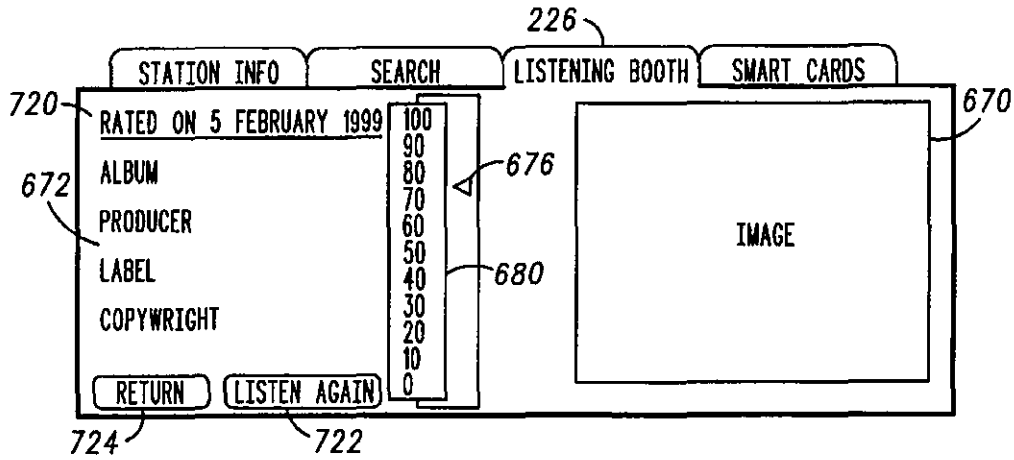


FIG. 28

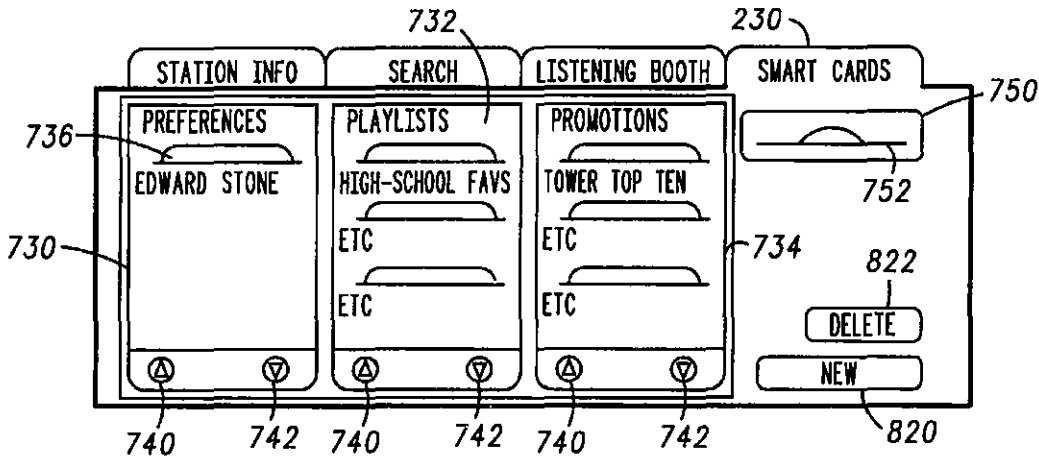


FIG. 29

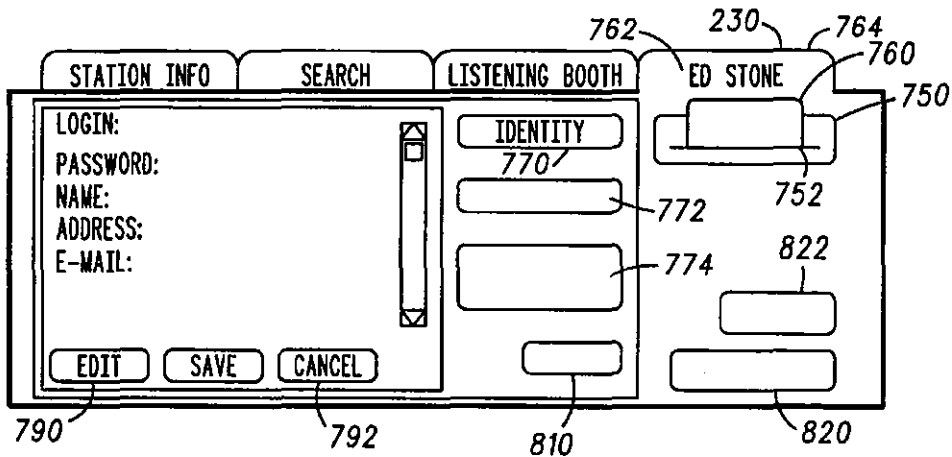


FIG. 30

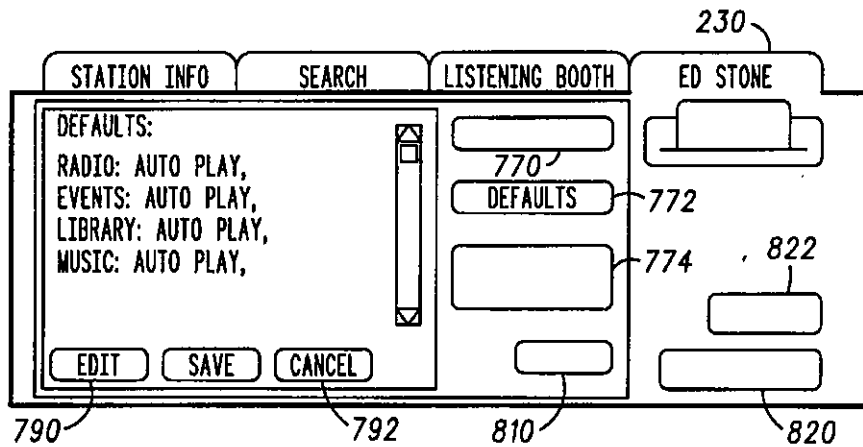


FIG. 31

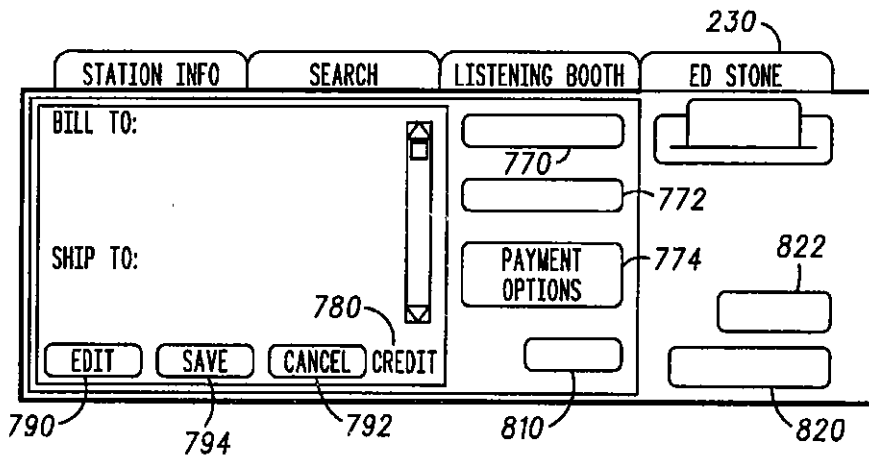


FIG. 32

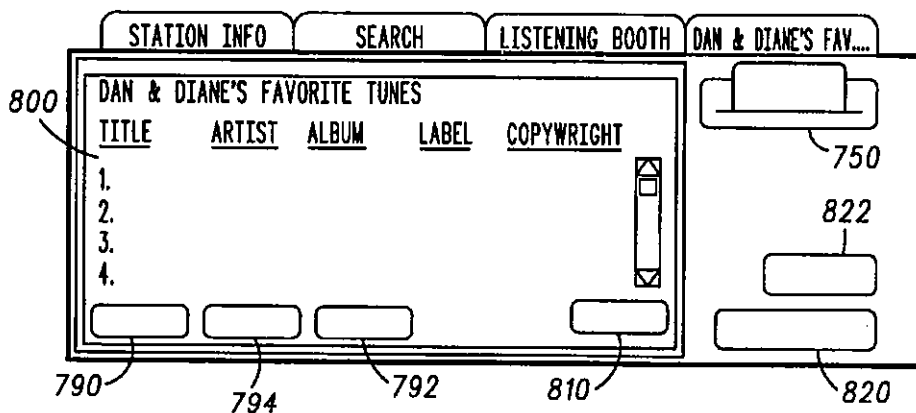


FIG. 33

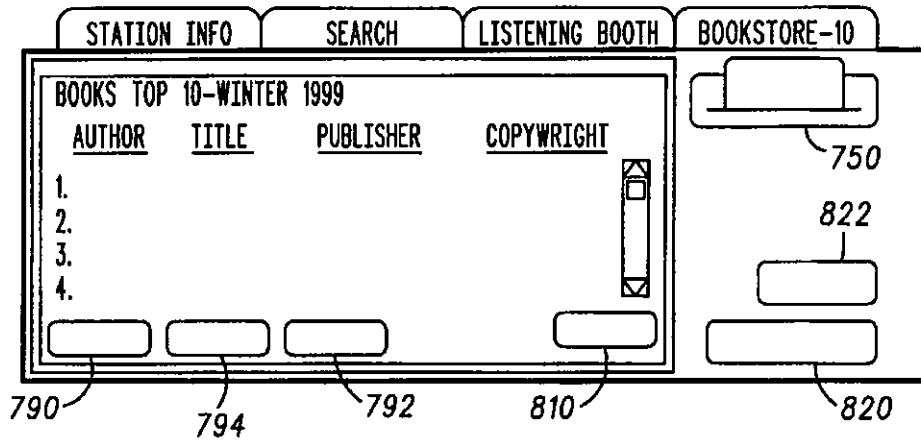


FIG. 34

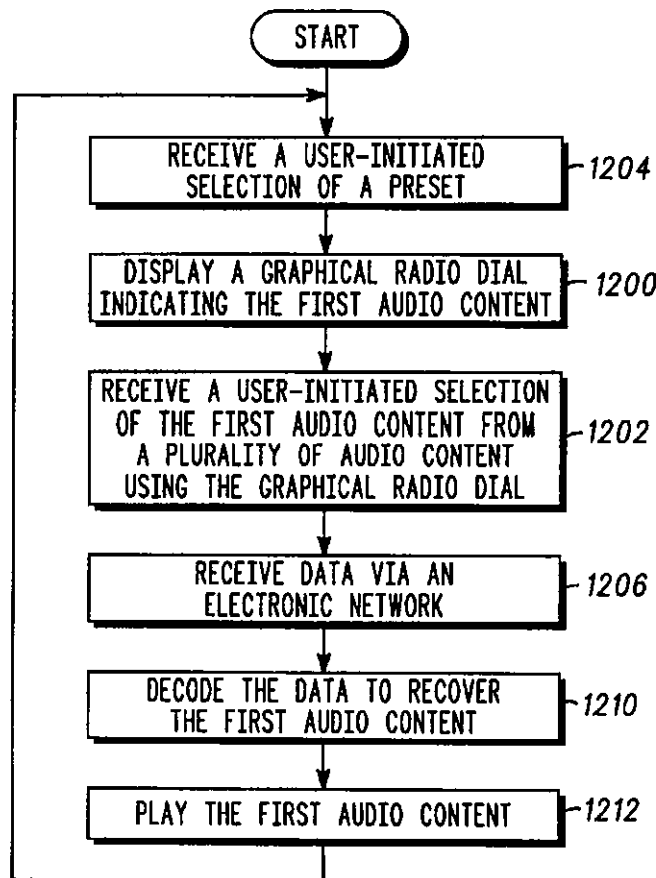


FIG. 44

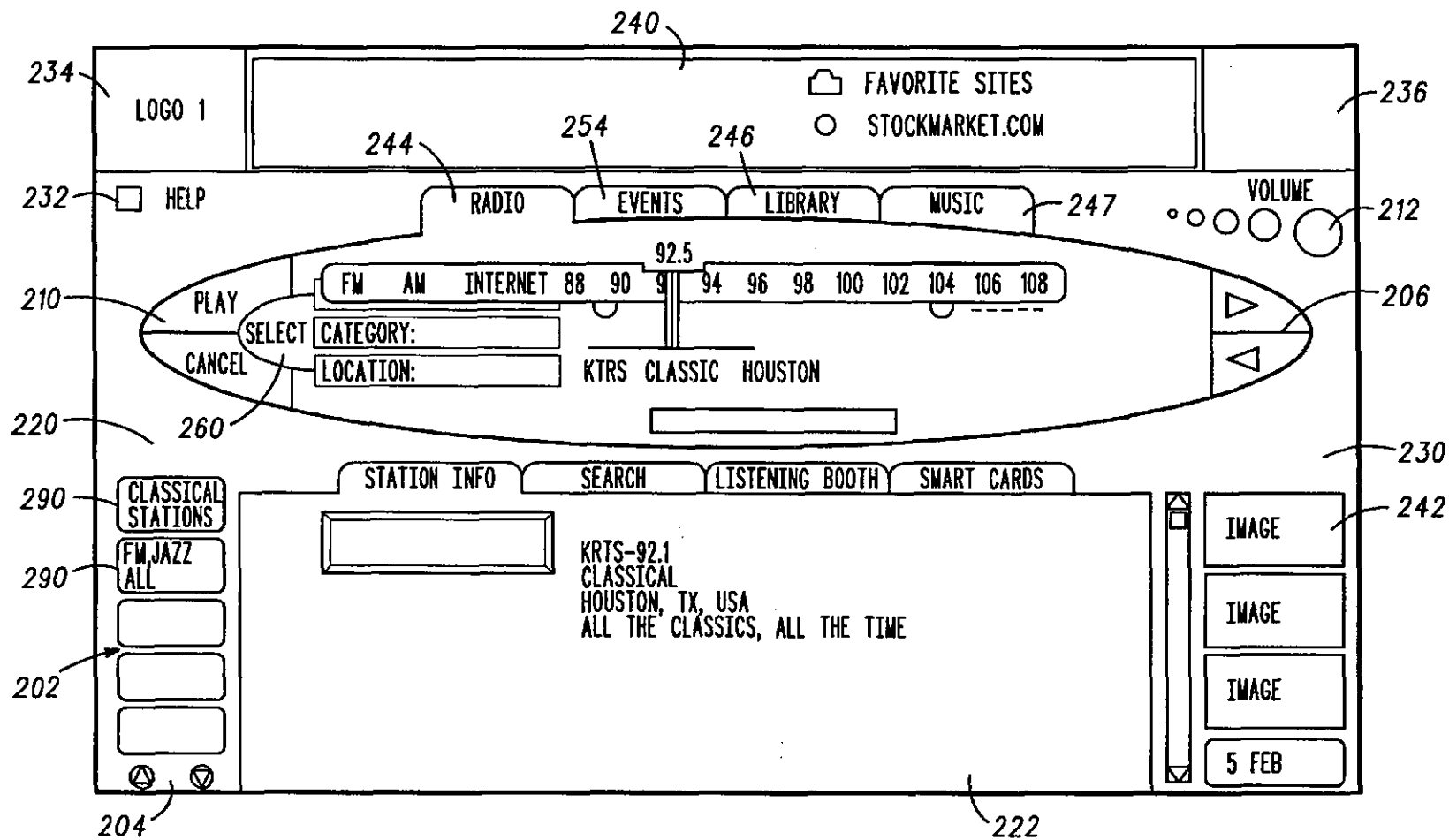


FIG. 35



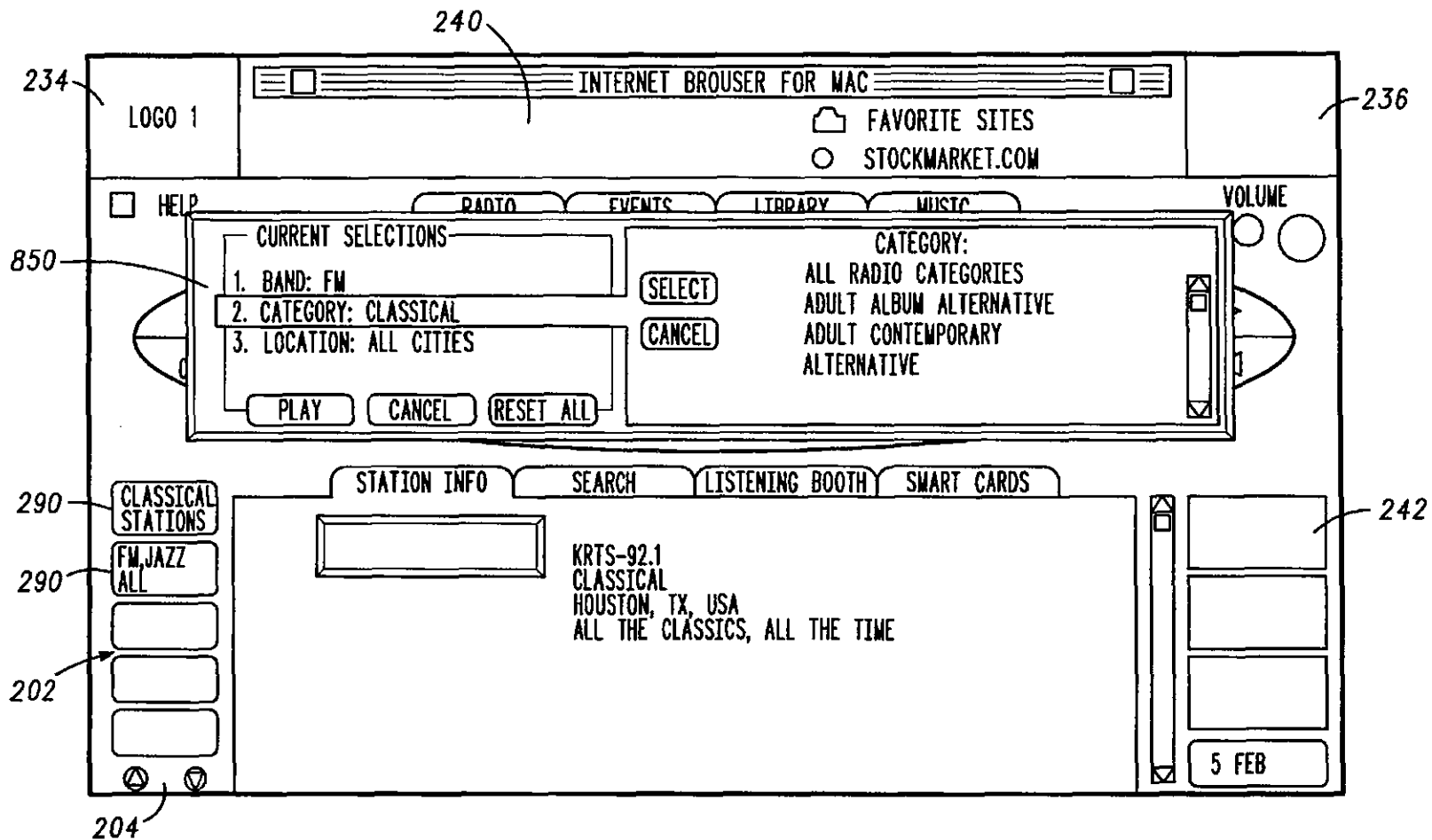


FIG. 36

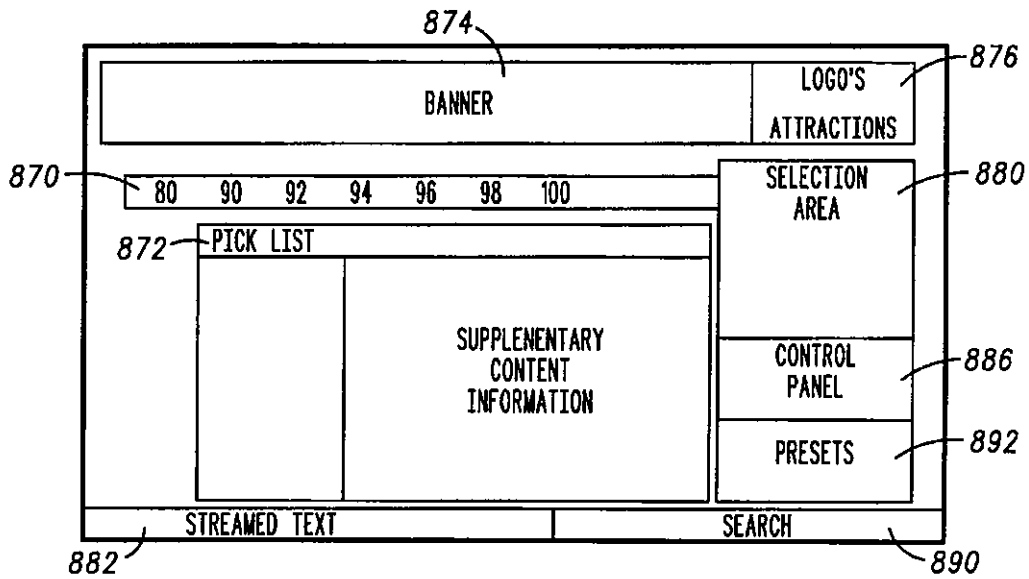


FIG. 37

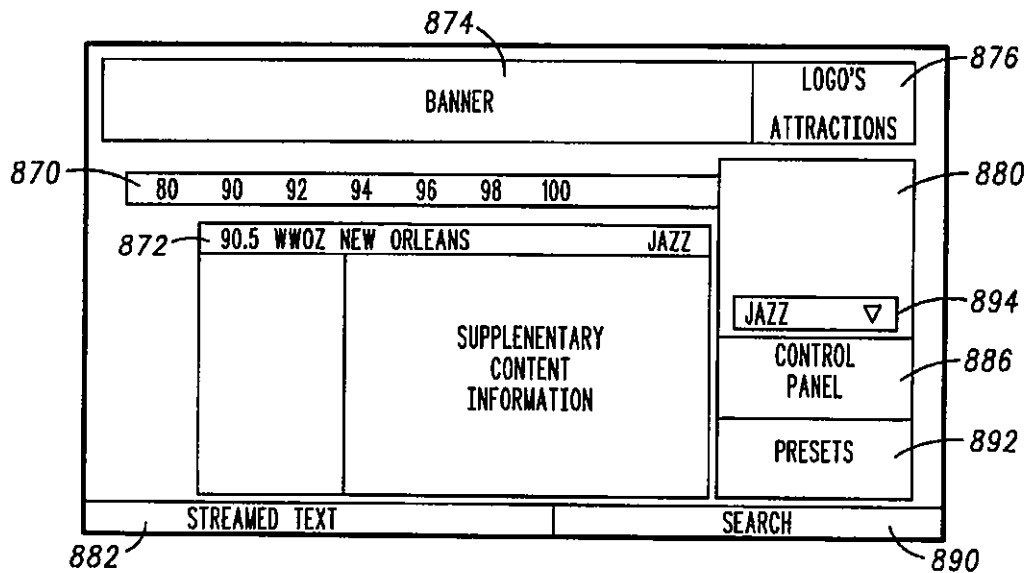


FIG. 38

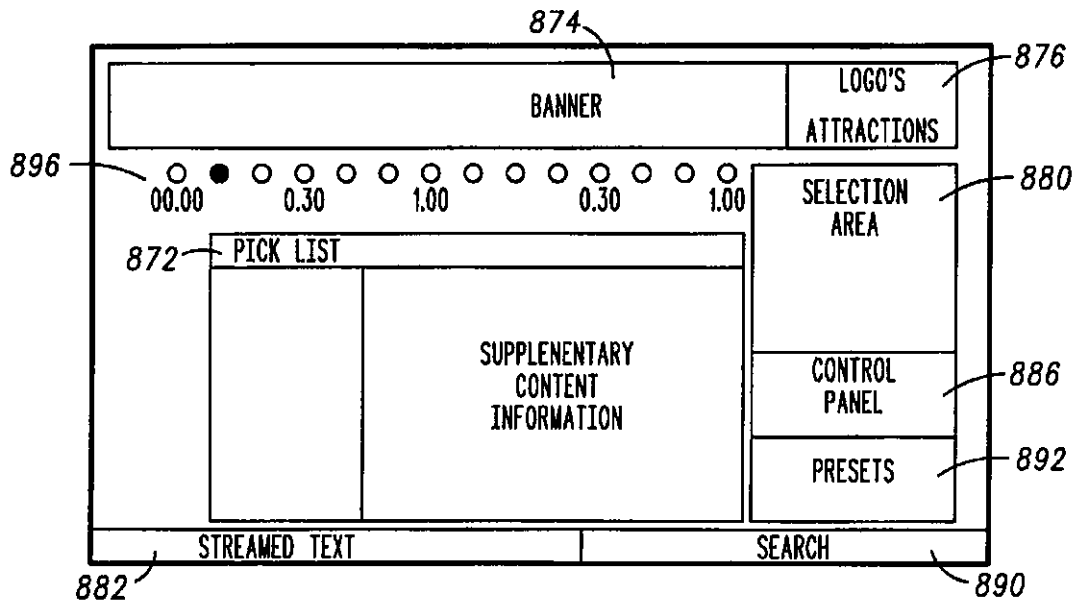


FIG. 39

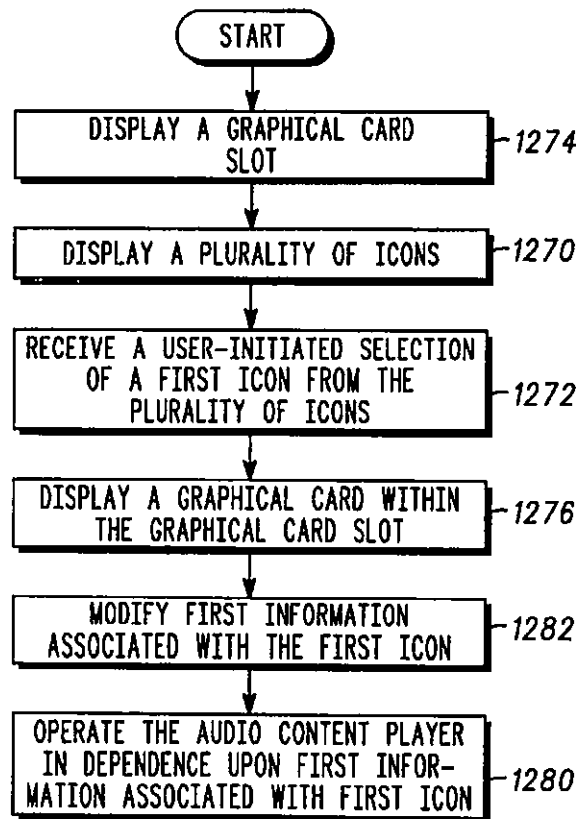


FIG. 46

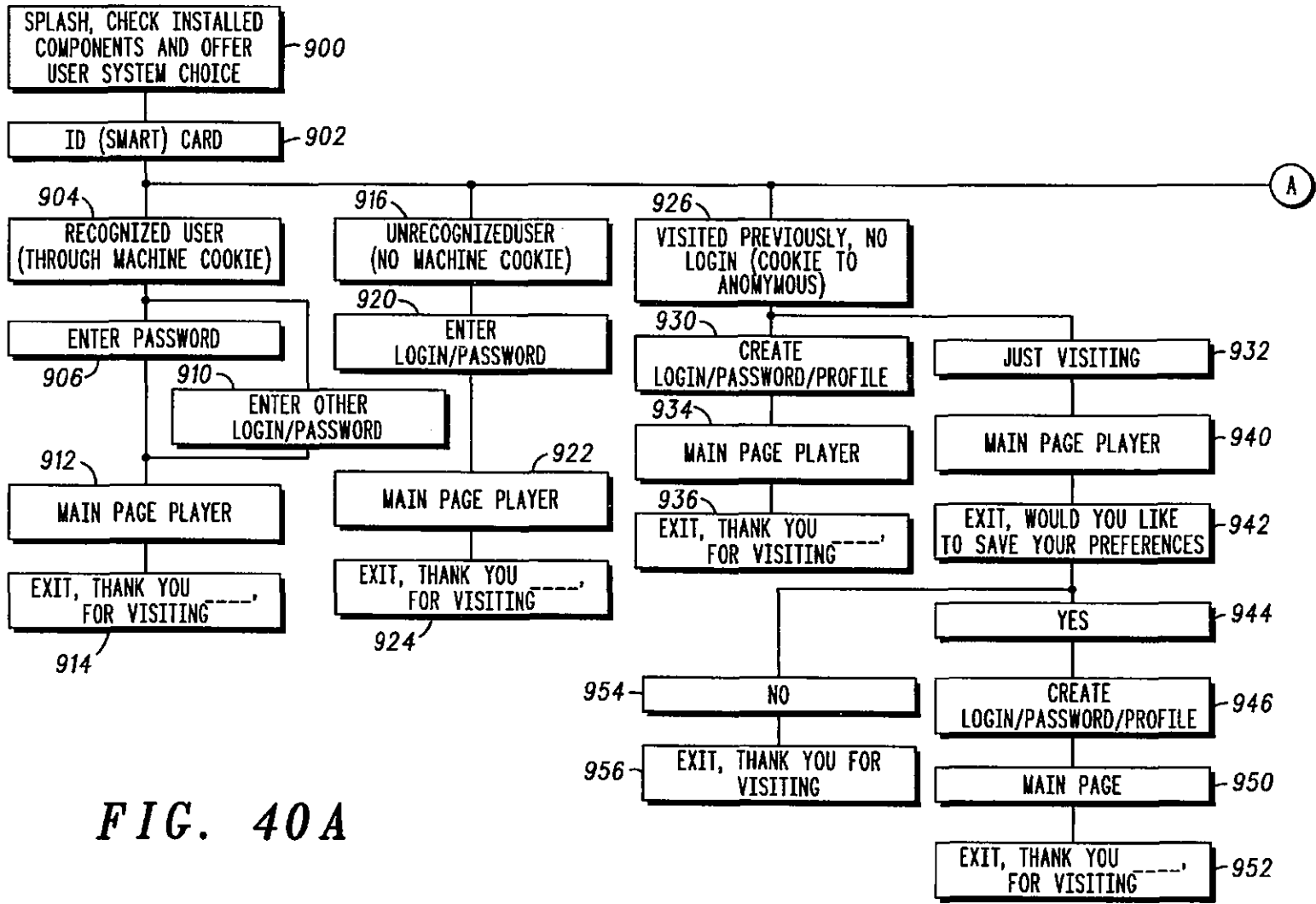


FIG. 40A

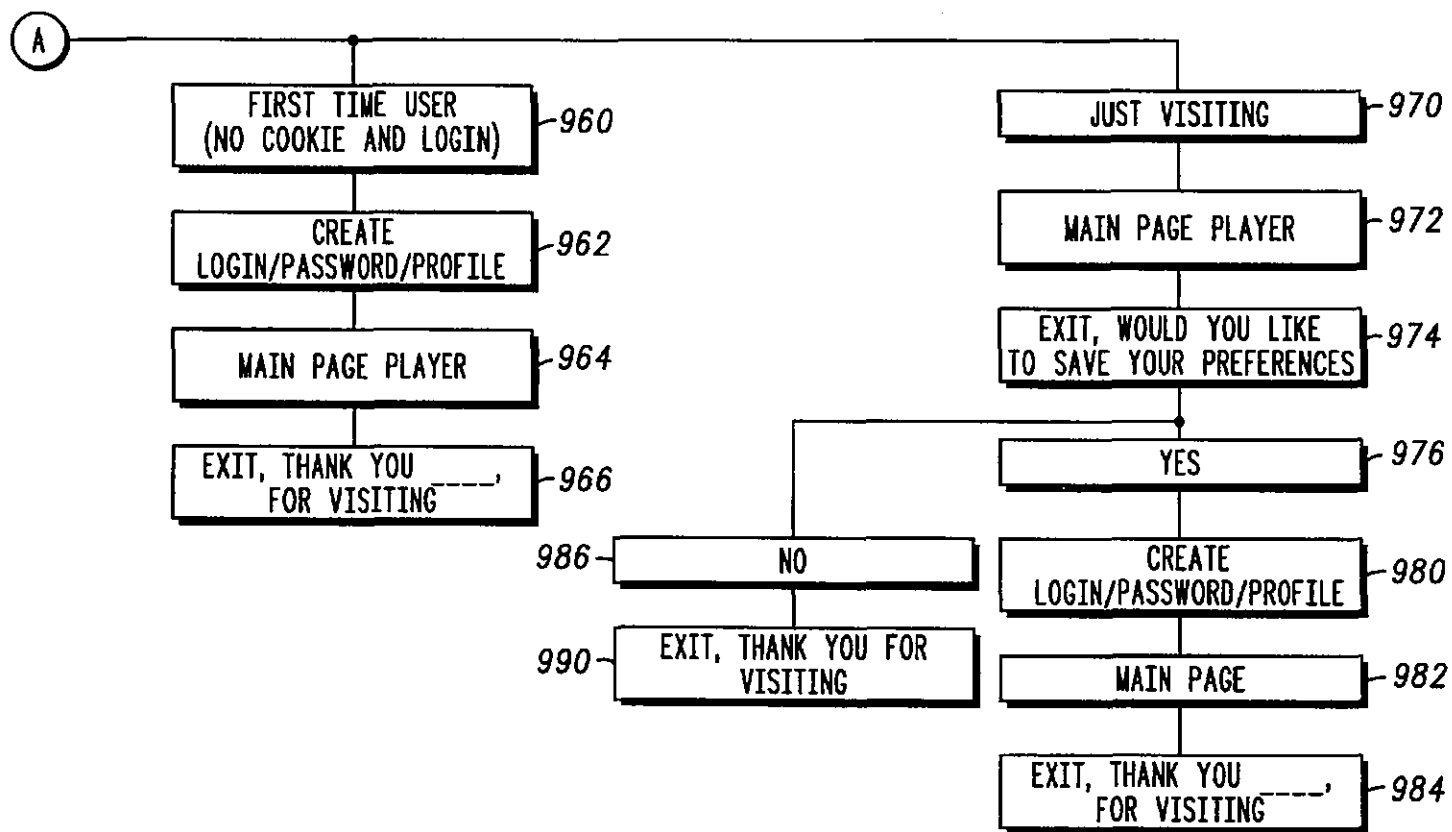
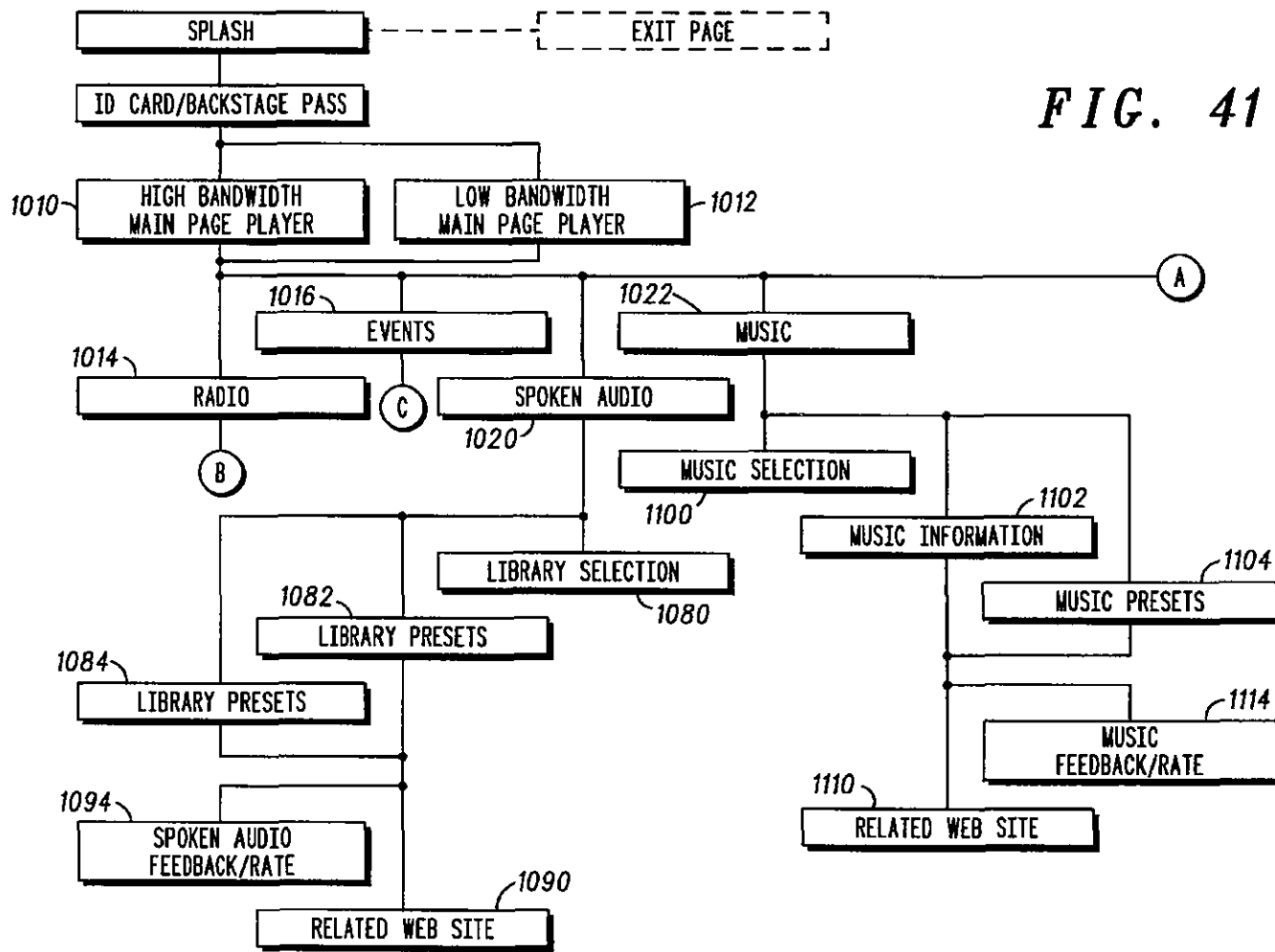


FIG. 40B

FIG. 41



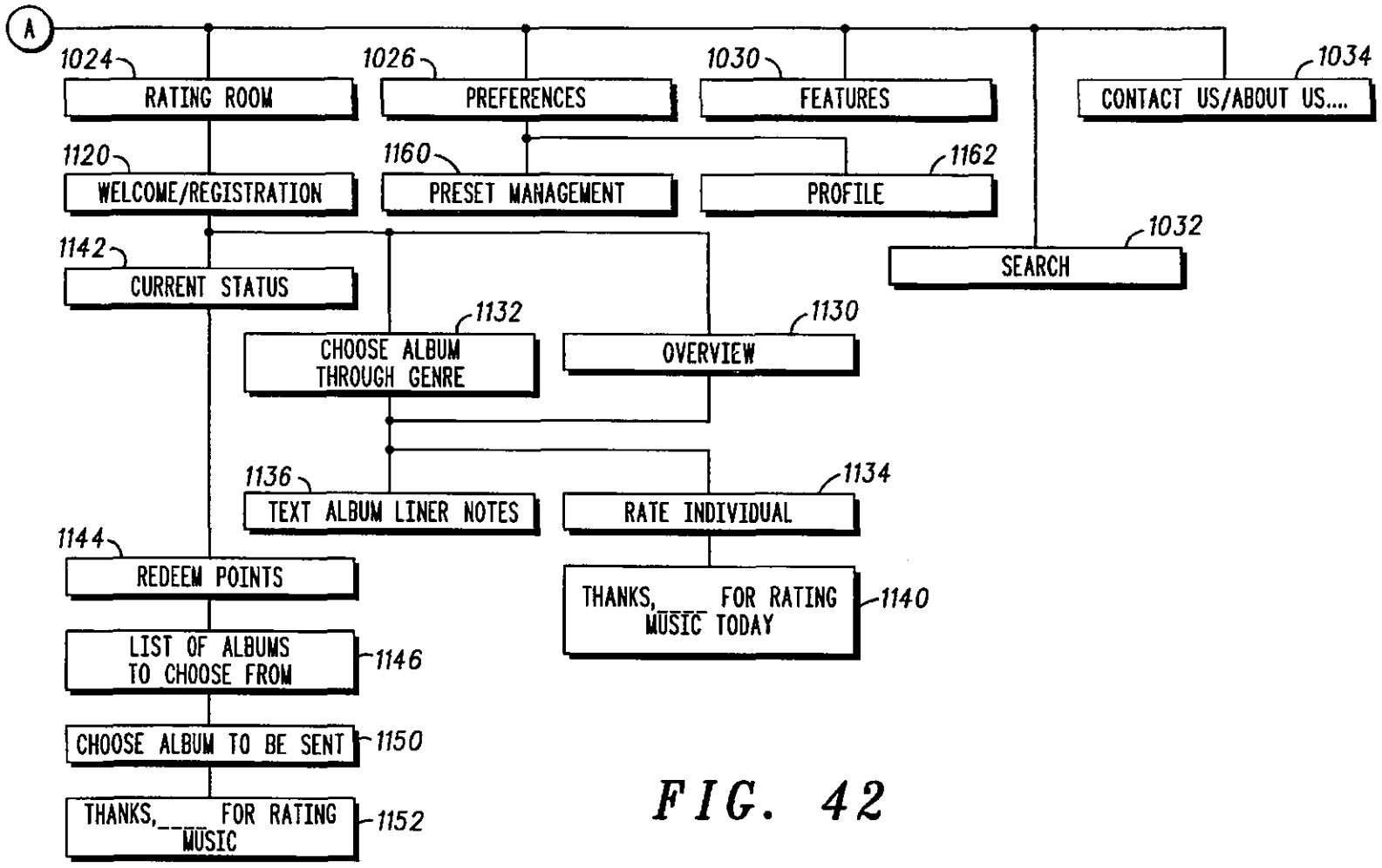


FIG. 42

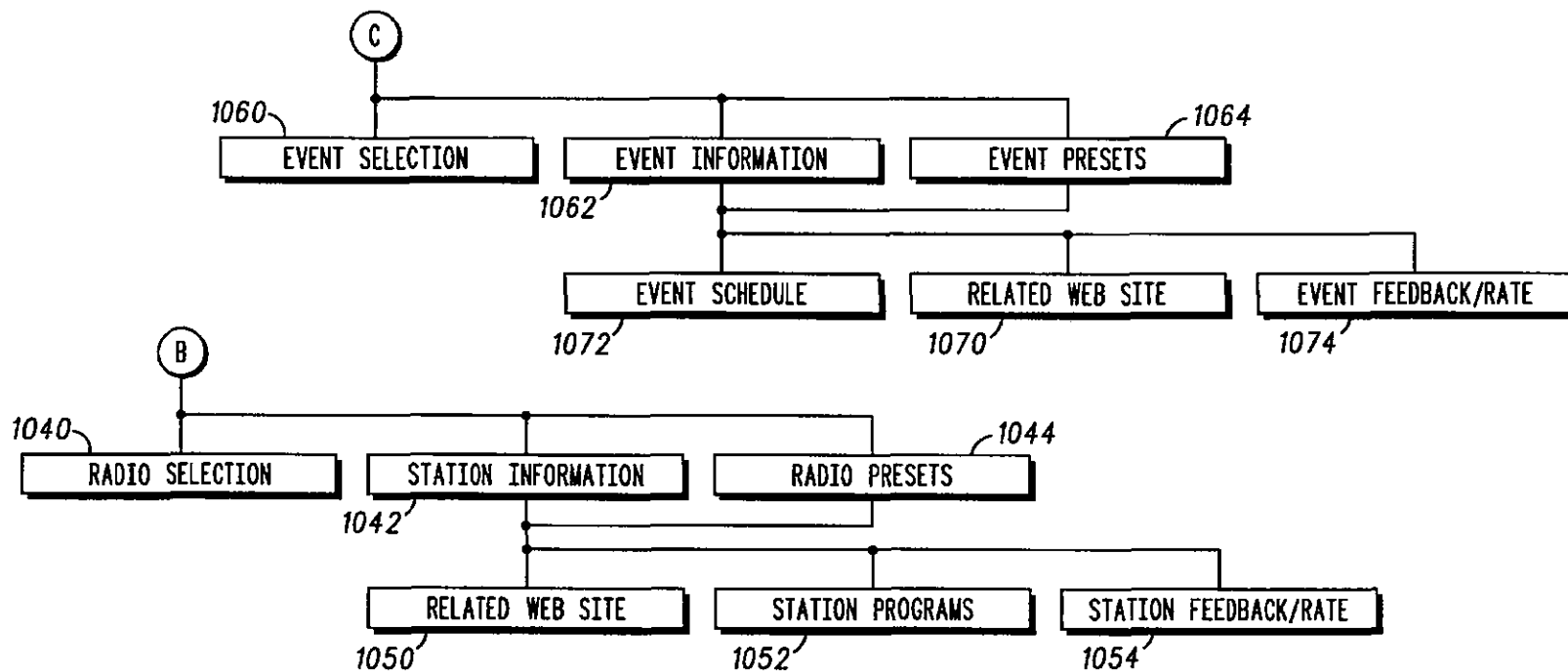


FIG. 43



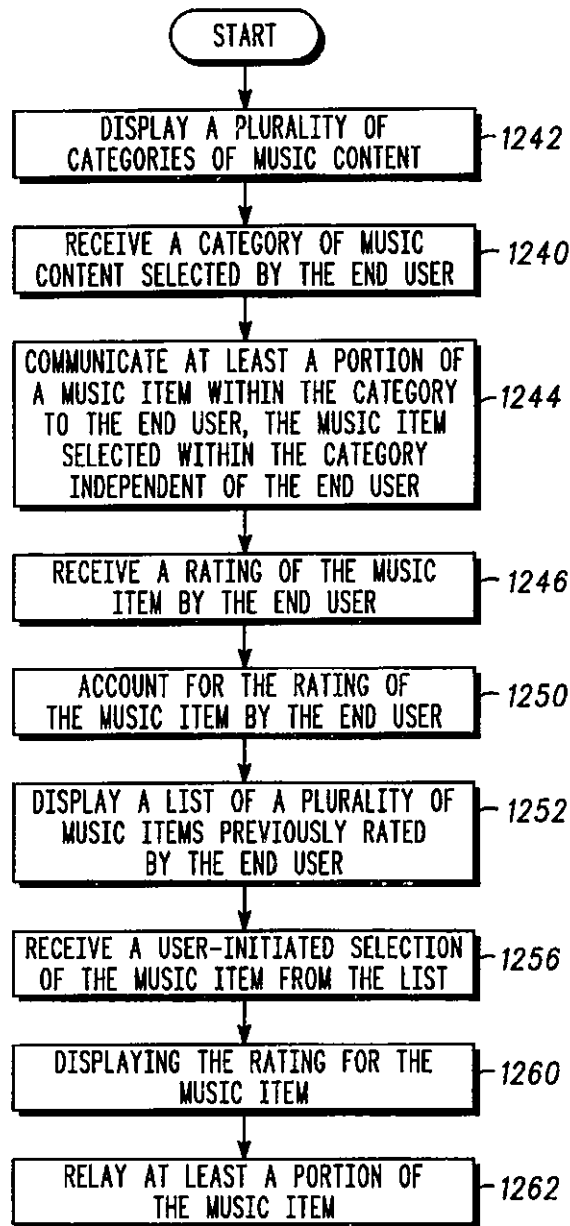


FIG. 45

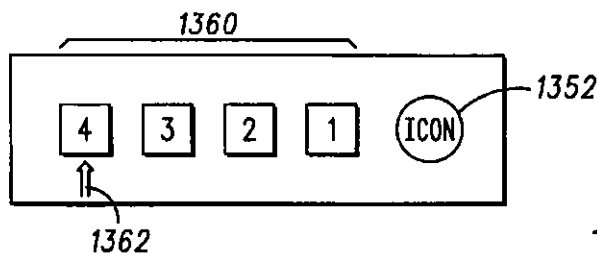


FIG. 51

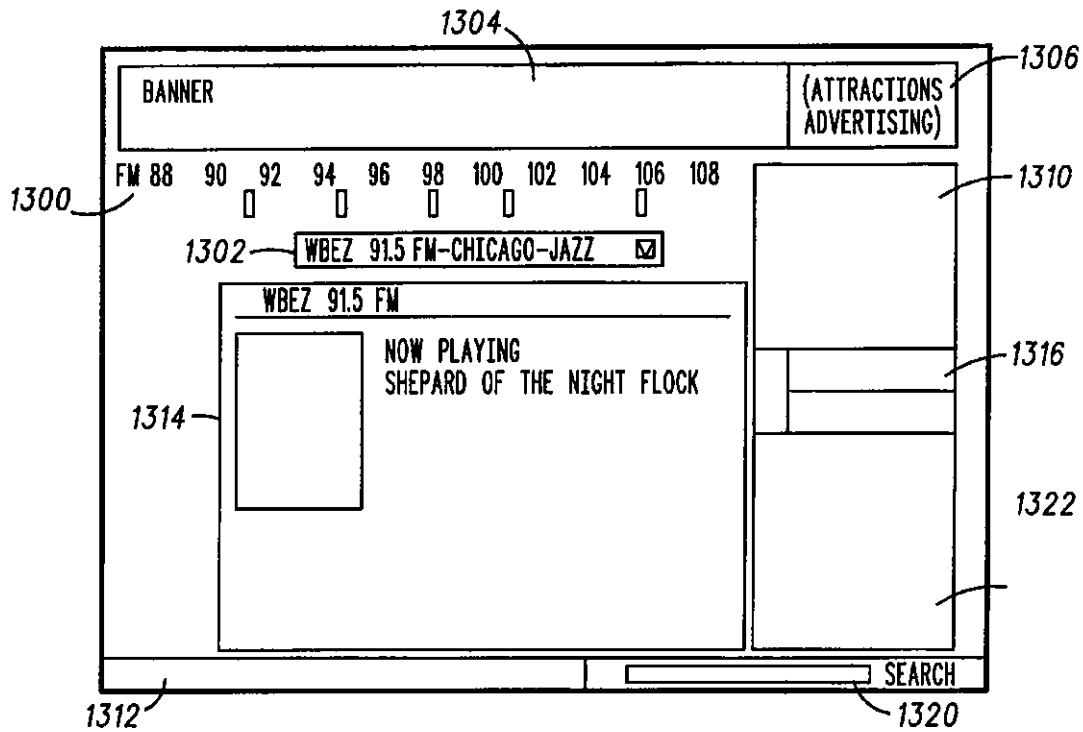


FIG. 47

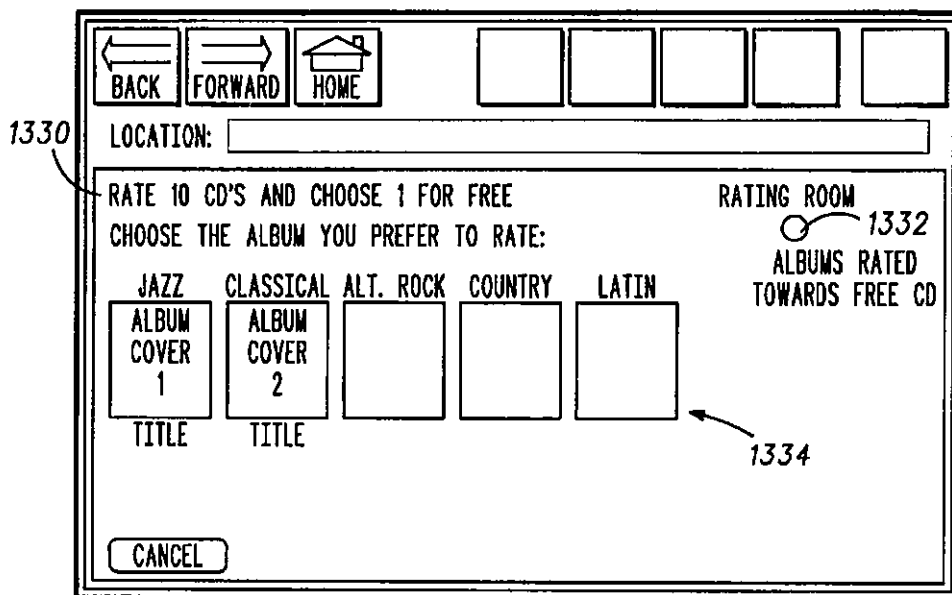


FIG. 48

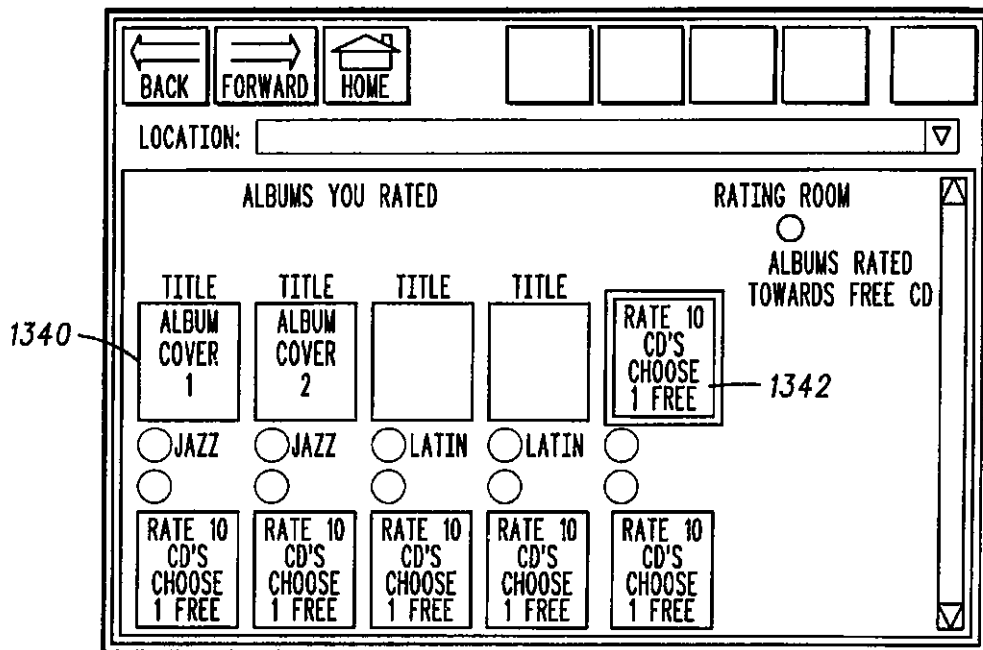


FIG. 49

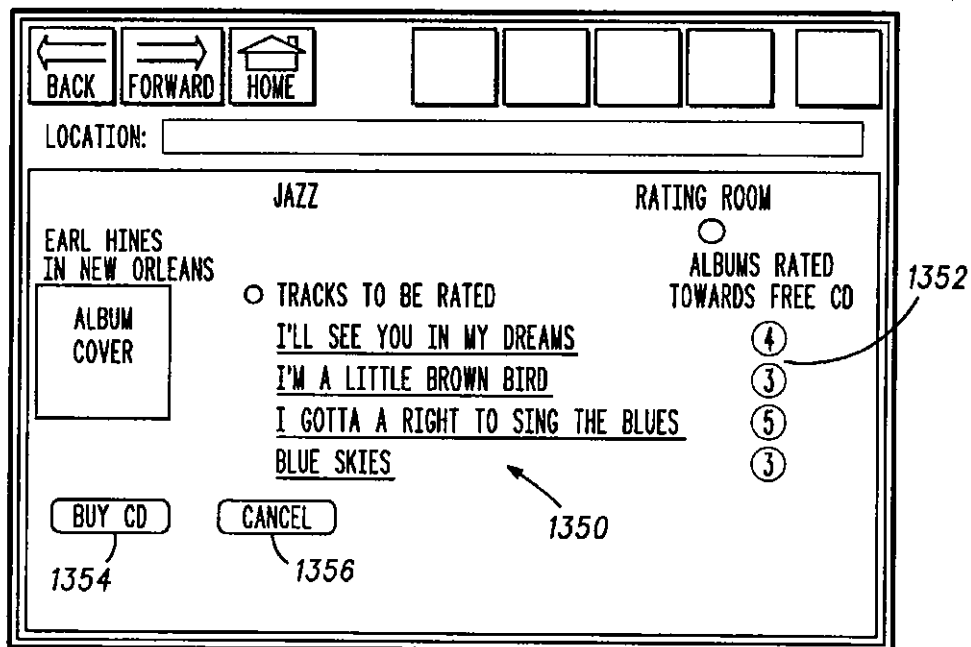


FIG. 50

BACK FORWARD HOME

LOCATION: \_\_\_\_\_

JAZZ RATING ROOM

ALBUMS RATED TOWARDS FREE CD

EARL HINES IN NEW ORLEANS

ALBUM COVER

TRACKS TO BE RATED

I'LL SEE YOU IN MY DREAMS (4)

I'M A LITTLE BROWN BIRD (3)

I GOTTA A RIGHT TO SING THE BLUES (5)

BLUE SKIES (3)

BUY CD CANCEL RATING COMPLETE SUBMIT RATINGS CANCEL

1370

FIG. 52

BACK FORWARD HOME

LOCATION: \_\_\_\_\_

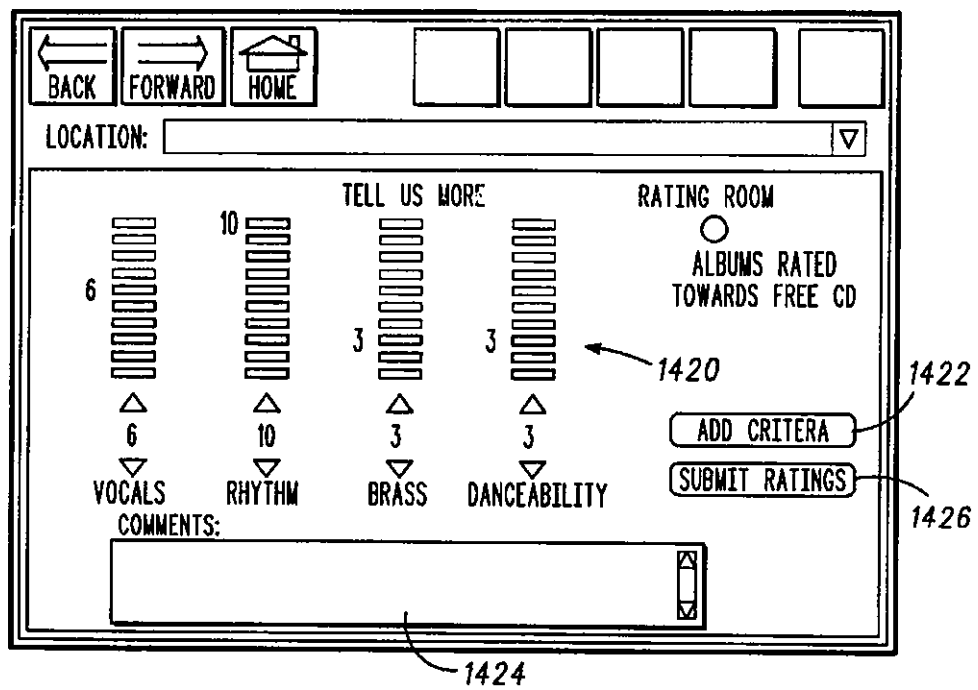
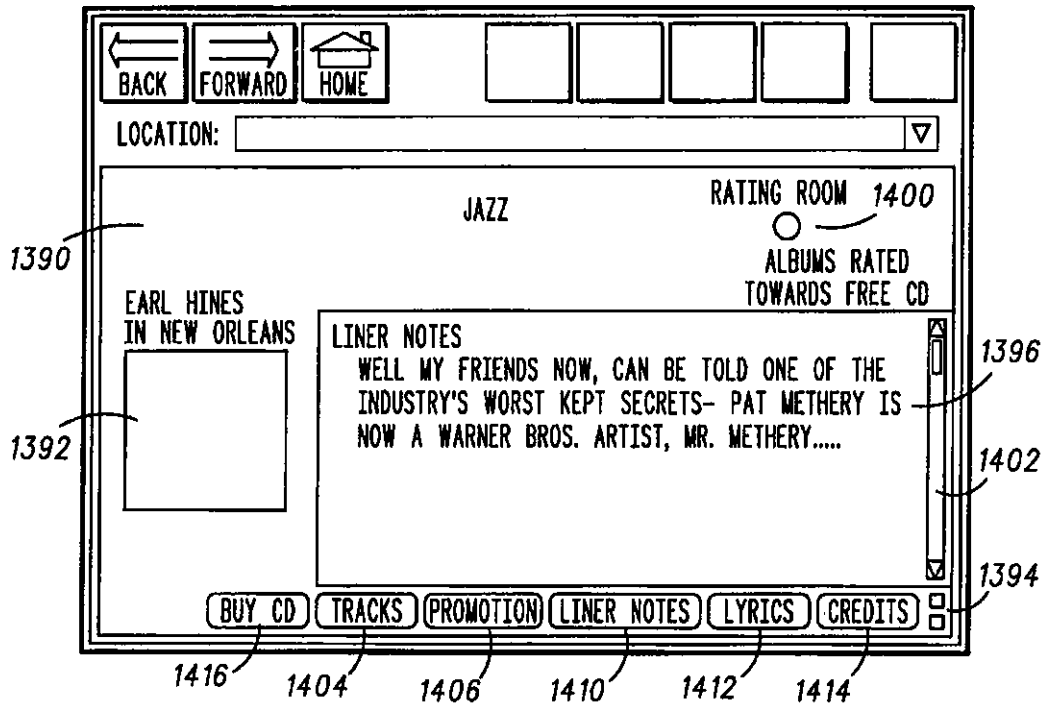
ALBUMS YOU RATED RATING ROOM

ALBUMS RATED TOWARDS FREE CD

TITLE	TITLE	TITLE	TITLE	TITLE
ALBUM COVER	ALBUM COVER	ALBUM COVER	ALBUM COVER	ALBUM COVER
1	2	3	4	5
① JAZZ	② JAZZ	③ LATIN	④ LATIN	⑤ JAZZ
⑥	⑦	⑧	⑨	⑩
RATE 10 CD'S CHOOSE 1 FREE	RATE 10 CD'S CHOOSE 1 FREE	RATE 10 CD'S CHOOSE 1 FREE	RATE 10 CD'S CHOOSE 1 FREE	RATE 10 CD'S CHOOSE 1 FREE

1380

FIG. 53



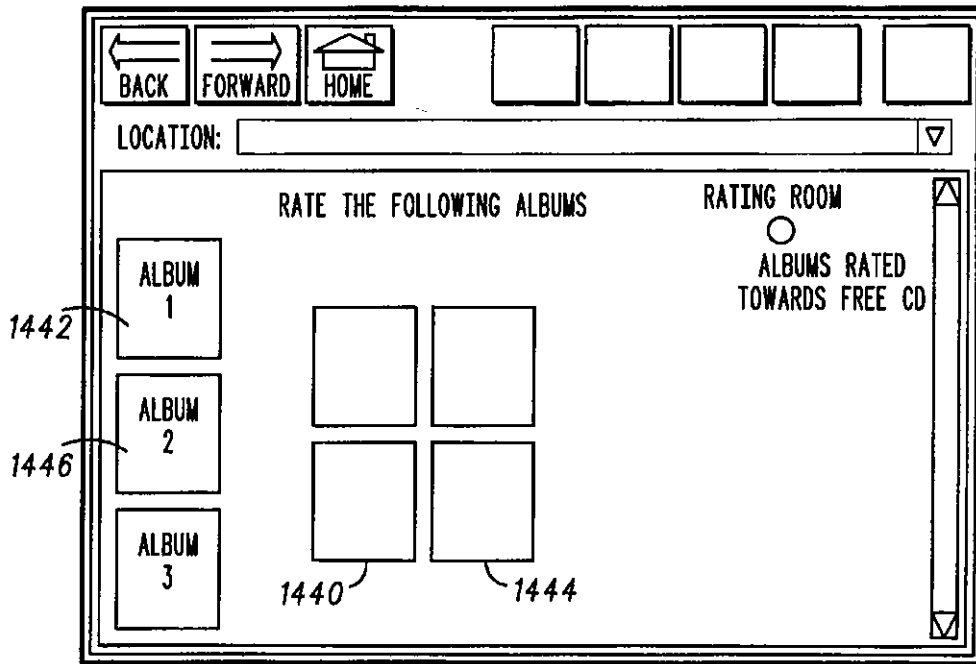


FIG. 56

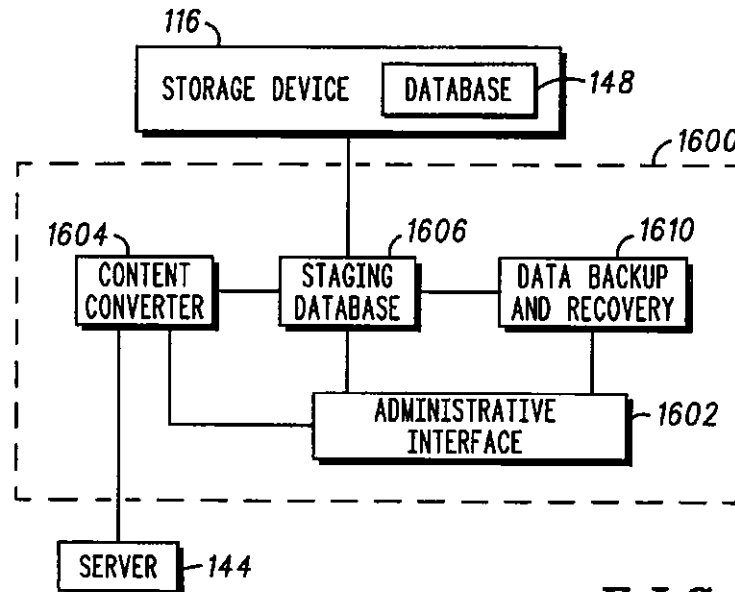


FIG. 58

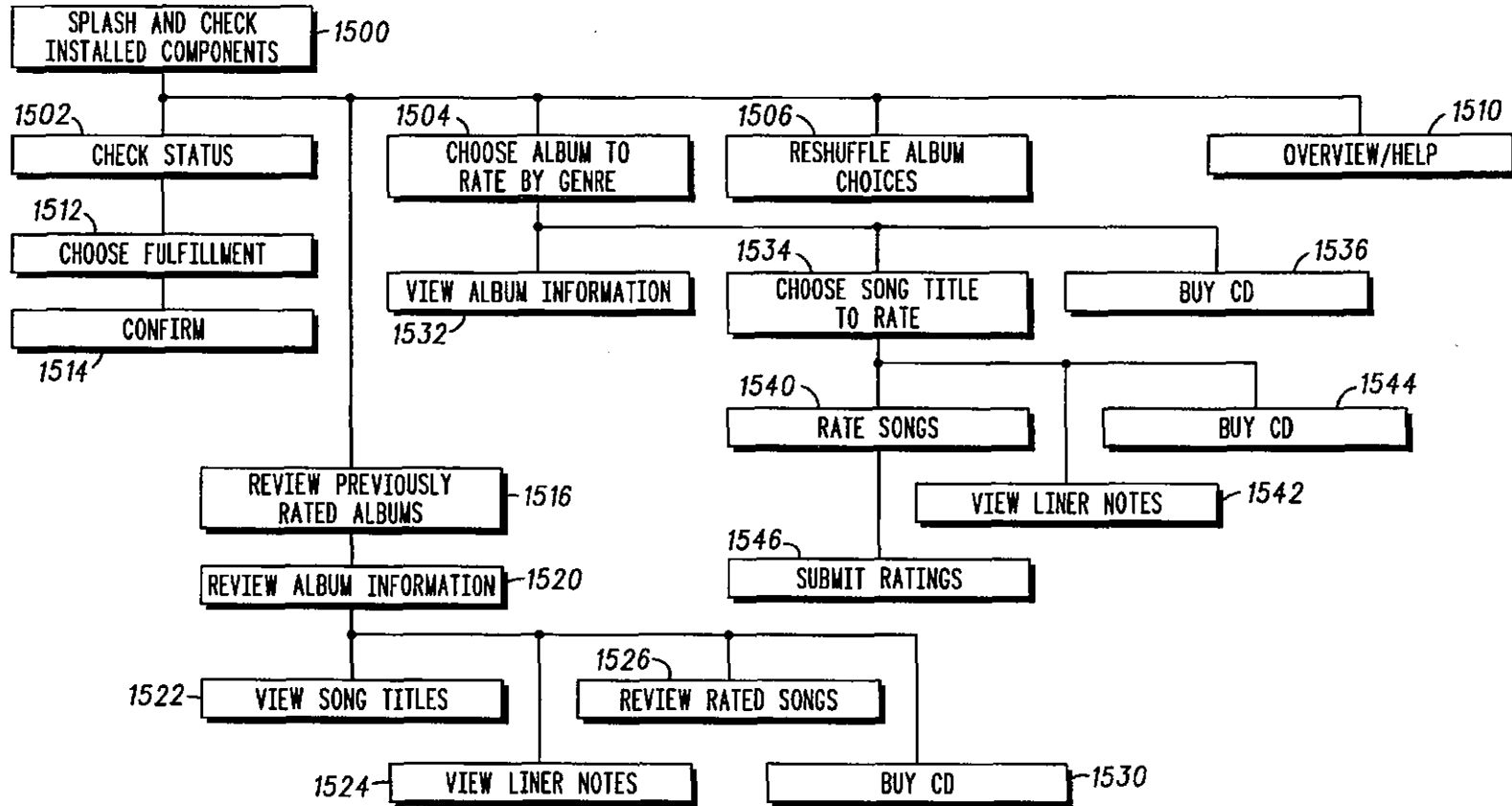
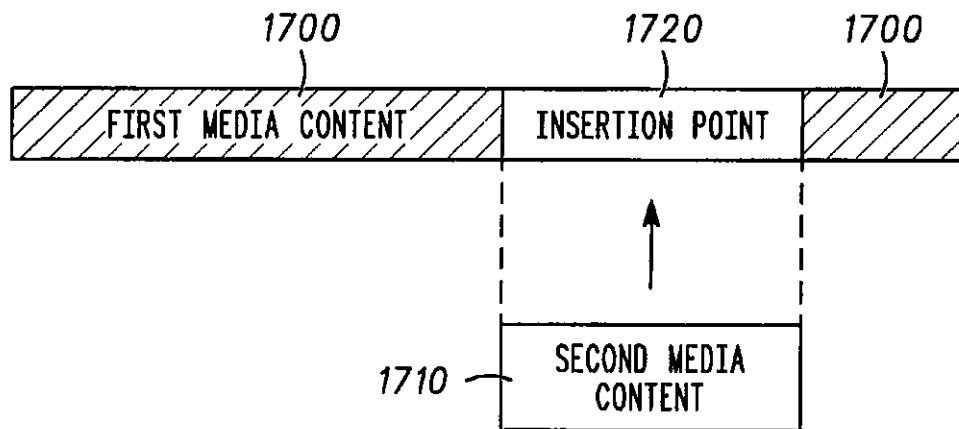


FIG. 57



**FIG. 59**



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## CONTENT PLAYER METHOD AND SERVER WITH USER PROFILE

### RELATED APPLICATION(S)

This is a continuation-in-part of U.S. patent application Ser. No. 08/976,971 filed on Nov. 25, 1997, now abandoned.

### TECHNICAL FIELD

The present invention relates to methods and systems for distributing and playing content such as audio content.

### BACKGROUND OF THE INVENTION

An increasing number of audio content items are becoming accessible via the Internet. Many radio stations now simulcast their over-the-air broadcast via the Internet. Some television networks are also simulcasting their over-the-air or cable broadcasts via the Internet. In addition, archived items such as archived radio programs, speeches, and music are also available via the Internet.

An audio content item is communicated to an end user's computer using either streamed data or a data file. The end user's computer decodes the streamed data or the data file using audio player software. Examples of audio player software include RealPlayer from Real Networks and Netscape Media Player from Netscape. The audio player software directs the computer to play back the audio content item.

Services such as AudioNet (whose Internet domain name is registered to AudioNet, Inc. of Santa Clara, Calif., U.S.A., and administered by Yahoo! Inc. of Sunnyvale, Calif., U.S.A.) and Timecast (whose Internet domain name is registered to Progressive Networks, Inc. of Seattle, Wash., U.S.A.) provide directories for audio content items available via the Internet. Using these services, the end user can select an audio content item for playback using his/her computer. However, interaction between the audio player software and the service may be limited to that necessary to play back the audio content item.

User feedback to movies and music is also currently of interest. Movie Critic (whose Internet domain name is registered to Songline Studios, Macromedia, Inc., of San Francisco, Calif., U.S.A.) recommends movies of potential interest to an end user in return for the end user's rating of a movie he/she has seen. Billboard magazine and its associated Web site provide music rankings based on sales and air play.

Broadcast Architecture provides a service for testing audio playlists. A methodology employed by Broadcast Architecture comprises physically assembling one or more listeners to test a playlist, playing one or more songs to the listeners, and receiving rating signals from the listeners. The rating signals are generated by listeners turning up or down a dial depending on whether they like or dislike a song. The rating signals can be plotted in a time series to interpret the results.

### BRIEF DESCRIPTION OF THE DRAWINGS

The invention is pointed out with particularity in the appended claims. However, other features of the invention are described in the following detailed description in conjunction with the accompanying drawings in which:

FIG. 1 is a block diagram of an embodiment of a system for providing audio content via an electronic network;

FIG. 2 is a first display window in an embodiment of a graphical user interface;

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FIG. 3 is a display of a portion of the graphical user interface including selection attribute indicators;

FIG. 4 is an illustration of an embodiment of a streaming indicator;

FIG. 5 is an illustration of an embodiment of volume controls;

FIG. 6 is an illustration of an example of a portion of a display window upon receiving a user-initiated selection of a radio category control;

FIG. 7 is an illustration of an example of a graphical radio dial for selecting Internet or other electronic network broadcasts;

FIG. 8 is an example illustration of using a location attribute field;

FIG. 9 is an example of a second display region providing auxiliary information about a particular station;

FIG. 10 is an example of a programming guide in a second display region;

FIG. 11 is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of an events category control;

FIG. 12 is an example illustration of using a time attribute field;

FIG. 13 is an example illustration of using an event attribute field;

FIG. 14 is an illustration of an example of a notification prompt;

FIG. 15 illustrates an example of the second display region displaying auxiliary information about an event;

FIG. 16 is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of the library category control;

FIG. 17 shows an example of text in the fields associated with an approach to navigating to library material;

FIG. 18 shows an indicator of which chapter is current and the number of chapters that exist;

FIG. 19 illustrates an example of the second display region being used to provide auxiliary information about a title;

FIG. 20 is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of a music category control;

FIG. 21 shows an indicator of which track is current and the number of tracks that exist;

FIG. 22 illustrates an example of a search feature provided in the second display region;

FIG. 23 illustrates an example of search results displayed in the second display region;

FIG. 24 illustrates an example of a listening booth feature provided in the second display region;

FIG. 25 is an example of a second display for the listening booth feature;

FIG. 26 is an example of a third display for the listening booth feature;

FIG. 27 is an example display provided upon selecting the control;

FIG. 28 depicts an example of a portion of the interface displayed upon selecting an icon;

FIG. 29 illustrates an example of a card organizer display for a smart card feature;

FIG. 30 is an example portion of the interface displayed in response to a drag-and-drop operation;

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FIG. 31 shows a display of a defaults area initiated upon selecting a second graphical button;

FIG. 32 shows a display of a payment options area initiated upon selecting a third graphical button;

FIG. 33 is an example portion of the interface displayed in response to a drag-and-drop operation of a playlist smart card to the fourth portion;

FIG. 34 is an example portion of the interface displayed in response to a drag-and-drop operation of a promotions smart card to the fourth portion;

FIG. 35 is a screen shot of a first preferred embodiment of the graphical user interface in the radio content mode;

FIG. 36 is a screen shot showing a content selection interface in the first preferred embodiment;

FIG. 37 is a screen shot of a second preferred embodiment of the graphical user interface;

FIG. 38 is a screen shot of the second preferred embodiment in a radio player mode;

FIG. 39 is a screen shot of the second preferred embodiment in an events player mode;

FIGS. 40A and 40B are flow charts of an embodiment of a method of providing the graphical user interface;

FIGS. 41 to 43 are block diagrams summarizing a site map for an embodiment of the graphical user interface;

FIG. 44 is a flow chart summarizing steps performed in an embodiment of a method of playing first audio content using a computer;

FIG. 45 is a flow chart summarizing steps in an embodiment of a method of obtaining user feedback to music content;

FIG. 46 is a flow chart summarizing steps in an embodiment of a method of assisting operation of an audio content player;

FIG. 47 is a screen shot of a third embodiment of the graphical user interface;

FIG. 48 is an example of a first display in a preferred embodiment of a listening booth or rating room feature;

FIG. 49 is an example of a second display for reviewing rated items in an embodiment of a listening booth or rating room feature;

FIG. 50 is an example of a third display for rating an item in a preferred embodiment of a listening booth or rating room feature;

FIG. 51 is a view of an embodiment of the graphical rating tool;

FIG. 52 is an example of a modified third display, in an embodiment of a listening booth or rating room feature, once all of the tracks for an item have been rated;

FIG. 53 is an example of the second display, in an embodiment of a listening booth or rating room feature, updated based upon a submission of ratings for the item;

FIG. 54 is an example of a fourth display in an embodiment of a listening booth or rating room feature;

FIG. 55 is an example of a fifth display in an embodiment of a listening booth or rating room feature;

FIG. 56 is an example of a sixth display in an embodiment of a listening booth or rating room feature;

FIG. 57 is a block diagram summarizing a site map for an embodiment of the listening booth or rating room feature; and

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FIG. 58 is a block diagram of an embodiment of a content entry subsystem.

FIG. 59 is a block diagram representing an association between media contents of the present invention.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. 1 is a block diagram of an embodiment of a system for providing audio content via an electronic network 100. Preferably, the electronic network 100 includes the Internet, the World Wide Web, an intranet, an extranet, or an on-line service such as America Online or WebTV.

The system comprises a server 102 which communicates with a plurality of client apparatus 104 including a client apparatus 106 via the electronic network 100. The server 102 includes a computer 110 having a processor 112, a memory 114, and a storage device 116. The server 102 has a transceiver 120 such as a modem, a network adapter, or a wireless transceiver which interfaces with the electronic network 100.

The client apparatus 106 can have a variety of forms, including but not limited to, a general purpose computer, a network computer, a network television, an Internet television, and a wireless device. Regardless of its form, the client apparatus 106 typically includes a processor 122 in communication with at least one input device 124, a transceiver 126, a memory 130, at least one storage device 132, a display device 134, and an audible output device 136. Optionally, the client apparatus 106 includes a smart card reader 140.

The processor 122 can include a microprocessor, an application-specific integrated circuit, or another suitable integrated circuit. The memory 130 can include a read-only memory and/or a random access memory in communication with the processor 122. The transceiver 126 can include a modem, a network adapter, or a wireless transceiver to communicate signals via the electronic network 100. The at least one input device 124 can include a keyboard, a pointing device, and/or a touch screen for receiving user-initiated events, actions, and selections from an end user. The at least one storage device 132 can include a floppy disk drive, a PC card storage device, an optical drive, a Digital Video Disk (DVD) drive, a Compact Disk Read Only Memory (CD-ROM) drive, or a hard drive to store computer-readable data. The display device 134 can include a monitor such as a liquid crystal display or a cathode ray tube to display a graphical user interface. The audible output device 136 can include a sound card and/or one or more speakers to play audio content to the end user.

A content delivery component 141, including a player 142, resides on the server 102 to assist in selecting, retrieving, and playing the audio content. The player 142 includes a computer program or other form of software or firmware which directs the server 102 and the client apparatus 106 to provide a graphical user interface for selecting, retrieving, and playing back audio content. More particularly, the computer program is operative to process and respond to user-initiated events, actions, and selections made using the at least one input device 124, to select, retrieve, and playback the audio content using the audio output device 136. Preferably, the computer program includes one or more of Hyper Text Marking Language (HTML) code, an applet (e.g. a JAVA applet), and animation plug-in code (e.g. Shockwave code) to provide the graphical user interface. The player 142 is accessible via the electronic network 100 by a dedicated electronic address such as a URL (Uniform Resource Locator).

The player 142 accesses audio content either locally from the server 102 or remotely from a server 144, and communicates the audio content to the client apparatus 106 using streaming technology. The server 144 can include, for example, a server from which AudioNet content is accessible.

The player 142 is operable in two modes: a browse mode and a search mode. The search mode provides a user-invoked function for performing a key-word, text-based search for content. The browse mode supports a categorical search for content using a visual interface. The content is categorized into a plurality of categories of content to assist in browsing for content. Preferably, the categories include a radio category, an events category, a library category, and a music category.

The player 142 is responsive to either a smart card 146 or a virtual smart card stored at one or more of the client apparatus 106 and the server 102. The actual or virtual smart card can be used to separate access to content from the content itself. Further, the actual or physical smart card can act as a preference key to uniquely personalize a player for an individual in a consistent manner across all entry points or platforms. For a virtual smart card in this case, the client side provides a key to the server side of the preferences.

Optionally, the player 142 can provide a second visual interface having a smaller window that appears in the background. The smaller window provides a subset of the controls of the full graphical user interface. The subset of controls can include controls for selecting between programmed presets. For example, the smaller window can illustrate the presets.

The player 142 can cooperate with a browser program and/or a streaming audio plug-in program executed by the client apparatus 106. Examples of the browser program include, but are not limited to, Netscape Navigator and Microsoft Internet Explorer. Examples of the streaming audio plug-in program include, but are not limited to: RealAudio and RealPlayer from Real Networks, VxTreme and Netshow from Microsoft Corporation, VDOnet from VDO, TrueStream from Motorola, LiquidAudio, and other active streaming formats. Alternatively, the player 142 can include a stand-alone, application-based software program that is executed by the client apparatus 106. In this case, it is preferred that the software program be operable without requiring interaction with a browser program. The software program cooperates with a network access routine executed by the client apparatus 106.

It is noted that in general, the system can include a plurality of servers such as the server 102. Each of the servers is identified by a corresponding site identification code. Each of the servers can include a database 148 for managing and monitoring the operation of the system. In this case, each database 148 can include a set of global parameters stored in its storage device 116. One global parameter includes a listening time threshold parameter. If an end user listens to an audio item for a duration that attains or exceeds the listening time threshold, a listenership entry is recorded in the database 148; otherwise, no entry is recorded. Other global parameters include user permission parameters, and parameters for system level performance reports.

In general, some parameters are maintained for all of the databases. These parameters include those necessary to the operation and the performance of the system. Here, a parameter generated at one database site can be communicated to each of the other database sites. Each parameter change is entered with time and date stamps to reference its

value at a specified time and date. This information can be of use in generating system reports.

To provide additional features, the server 102 includes a customer profile component 150, a music testing component 152, an audience measuring component 154, a promotions component 156, an advertising component 160, a listener feedback component 162, and a transactions component 164. Each of these components includes a computer program module or other form of software or firmware to direct the server 102 to provide its associated feature.

The customer profile component 150 stores and manages a table of end user data. The end user data includes a record comprising one or more of a name, an address, a login, an electronic mail address, preferences, and demographics for each end user. Examples of end users include listeners and other consumers, broadcasters, and promoters (e.g. record labels). Optionally, the customer profile component 150 purges a record after a predetermined period of inactivity of its associated end user.

Each record in the table has a unique identification code, herein referred to as CustomerID, to identify its associated end user. The customer profile component 150 performs a check to ensure that only one CustomerID is created for each user. The CustomerID is used throughout the system to identify a particular end user. Each end user enters his/her unique login to access his/her preferences when using the player 142.

Several levels of customer profiles can exist. In a guest level, a generic CustomerID is created without requesting profile information. A message allowing a user to create a profile is presented whenever a customizing feature or a music testing capability is used. Listener feedback and advertising information is tracked for guests who do not create a profile. All such responses for guests are grouped together.

In a basic customer level, a CustomerID is created to provide the preferences capabilities of the system using a basic profile. A unique login name and password is included in the end user record. The login name and password is entered by the end user to access his/her profile. Specific demographic information may be requested from the end user before gaining basic customer status.

In a preferred customer level, a CustomerID is created with a more detailed profile than the basic customer level. In addition to the profile information in the basic customer level, the preferred customer level can require that an address of the end user be maintained in the end user record. In return, the end user is provided with exclusive features such as being enabled for promotions described herein.

The customer profile component 150 is provided to allow preferences to be available regardless of where the end user is accessing the system. For example, the end user can access the player 142 at either the client apparatus 106 or a client apparatus 104 using his/her preferences in the customer profile component 150.

The music testing component 152 provides a user interface (also referred to herein as a listening booth or a rating room feature) for a music testing service. The music testing service allows record labels and other promoters to test new music releases. The music testing component 152 manages the mechanics of the testing.

The audience measuring component 154 monitors and records data associated with a listening behavior of each end user when using the player 142. Based upon the data, one or more audience measurement reports are generated. The audience measurement reports may be of particular interest

to music directors of radio stations. The audience measuring component 154 can provide a "Arbitron-like" rating system for radio on the Internet that is familiar to terrestrial radio broadcasters.

The promotions component 156 tracks the performance of promotions offered to elicit responses using the music testing component 152. The promotions component 156 further manages the administration of the music testing component 152 in providing a delivery vehicle for promotional items such as rated albums.

The advertising component 160 manages audible and visible advertisements presented by the player 142. The audible advertisements can be inserted into the audio stream to replace audible advertisements played by a broadcaster (e.g. a radio station). The visible advertisements can be displayed in any of several areas of the display device 134.

The listener feedback component 162 receives and manages feedback messages from end users. The feedback messages can pertain to the system for providing audio content, the broadcasters (e.g. radio stations), the content (e.g. events), or advertising. Preferably, the feedback messages are entered using the player 142. The listener feedback component 162 identifies the content and/or the broadcaster presented to the end user at the time his/her feedback message was generated. Using this information, a suitable destination for routing the feedback message is determined. The listener feedback component 162 can include an electronic mail server to route the feedback messages. The listener feedback component 162 can further generate reports based upon the feedback.

The transactions component 164 is used to process transactions performed by end users and clients. Examples of transactions include end users purchasing content, and clients purchasing on-line reports. The transactions component 164 includes a database to record the transactions, and to process credit card information.

FIG. 2 is a first display window in an embodiment of the graphical user interface. As with the other herein-described display screens, display windows, and display regions, the first display window is displayed by the display device 134. The first display window provides a primary browsing window to offer basic features including basic content selection control and playback control to the end user.

The first display window includes categorical selection controls 200, preset selection indicators 202, preset selection controls 204, advance/review controls 206, playback controls 210, volume controls 212, selection attribute indicators 214, a streaming indicator 216, a first display region 218, an information control 220, a second display region 222, a search control 224, a user feedback control 226, a smart card control 230, a help mode control 232, a first logo 234, a second logo 236, an advertising window 240, and an attractions window 242.

Preferably, each of the aforementioned controls includes a hot spot region or a graphical button designated for receiving user-initiated selections and actions from the at least one input device 124. Examples of user-initiated actions include, but are not limited to, point-and-click operations with a pointing device such as a mouse, a trackball, or a touchpad, and touch actions using a touchscreen or a keyboard.

The categorical selection controls 200 are designated to receive user-initiated actions to choose a content category within which audio content can be selected. The categorical selection controls 200 include a radio category control 244, an events category control 245, a library category control

246, and a music category control 247. Each of the categorical selection controls 200 is displayed as a graphical tab.

The radio category includes content available from over-the-air broadcasts (including but not limited to AM and FM broadcasts) and Internet broadcast material encoded and distributed through the electronic network 100. The events category includes content from special occurrences, conventions, announcements, news, and sports events, for example, distributed by a scheduler or an event manager. The events category includes scheduled broadcasts of either live or archived material that is made available over the electronic network 100 at a scheduled time. The library category includes content from stored audio of books, archived speeches, spoken audio, and other content that appears without reference to a particular broadcast. The music category includes collections of music such as albums and other audio releases.

The radio category and the events category include content associated with a particular time, such as a live broadcast. The library category and the music category include content generally unreferenced to a particular time.

If, while material is active in a first content category, the end user proceeds to a second content category, the tab associated with the first content category is displayed with blinking text. In this case, the end user can proceed to the second content category using a point-and-click operation with the tab associated with the second content category or by use of the smart card. For example, if the radio category is active when the end user selects the music category tab, the radio category tab blinks until the end user returns to the radio category or until new material is streamed. When new material is chosen, the tab returns to its idle state.

To easily identify the active function, each of the four content categories are color coded. Preferably, the CMYK values of each content category is as follows: radio 0-49-96-0, events 23-96-100-9, library 79-7-100-0, and music 88-80-0-0.

If there is no selection of a content category, the text "INFO" is displayed in the information control 220. In this case, the text "INFO" is displayed in a color such as grey rather than a second color such as black when a content category is selected. Alternatively, the information control 220 can be selected to display a guide on how to make a selection in the current mode.

The playback controls 210 includes a play button 250 and a cancel button 252. The play button 250 is designated to receive a user-initiated action to initiate a playback of an audio selection. Text within the play button 250 is redisplayed in a reverse color upon receiving the user-initiated action. The reverse color indicates to the end user that the action has been received.

The default for the play button 250 is to automatically play titles and stations whenever available. If a title or a station cannot be played with chosen attributes, at least a portion of the play button 250 including the text "PLAY" is displayed in a first color such as grey. If a title or a station can be played with chosen attributes, the portion of the play button 250 including the text "PLAY" is redisplayed in a second color such as black. If an event has not yet occurred, the play button 250 displays the word "SCHEDULE".

During playback, the play button 250 is designated to receive a user-initiated action to pause the playback of the audio selection. Once paused, the play button 250 can receive a subsequent user-initiated action to continue the playback.

The cancel button 252 is designated to receive a user-initiated action to cancel an activity of the player. For

example, when selecting items using a selection table (which is subsequently described in detail), the cancel button 252 can be selected to exit from the selection table. As another example, when playing an audio selection, the cancel button 252 can be selected to stop the playback of the audio selection and to reset the player to keep the audio selection chosen.

The advertising window 240 provides advertising images. The advertising window 240 can further provide backward and forward navigation of advertisements.

FIG. 3 is a display of a portion of the graphical user interface including the selection attribute indicators 214. The selection attribute indicators 214 include a select button 260 and three attribute fields 262, 264, and 266. The select button 260 is designated to receive user-initiated actions to alternate between the three attribute fields 262, 264, and 266.

For radio content, the three attribute fields 262, 264, and 266 include a category attribute field, a band attribute field, and a location attribute field. For events, the three attribute fields 262, 264, and 266 include a category attribute field, a time attribute field, and an event attribute field. For library content, the three attribute fields 262, 264, and 266 include a category attribute field, an author attribute field, a title attribute field. For music content, the three attribute fields 262, 264, and 266 include a category attribute field, an artist attribute field, and a title attribute field.

A selection of the select button 260 directs the next attribute field to be displayed along with its associated options. For example, clicking the select button 260 while the band attribute field 264 is active causes the location attribute field 266 to become active, as illustrated.

A list of options 270 associated with an active attribute is displayed next to the three attribute fields 262, 264, and 266. The end user can scroll through the list using a scroll bar 272, an up scroll control 274, and/or a down scroll control 276. The end user can also navigate to an option by entering either a letter or a number of an item in the list of options 270.

When an intended option is highlighted (such as "Chicago" as illustrated), the end user can select the option by either: (i) double clicking on the option; (ii) clicking on the select button 260; (iii) selecting another attribute to choose; or (iv) clicking on the play button 250 if all the attributes are chosen. Once chosen, the intended option is displayed in its respective one of the three attribute fields 262, 264, and 266. If the cancel button 252 is selected at any time in this operation, no attribute is chosen and the player is reset to either a previous state or to an idle state.

Optionally, attributes can be selected from a personalized set of options so that a list of likely choices is smaller than a full set of options, and is filled with items more likely of interest.

It is noted that, except where noted, the list of options for each attribute includes an "ALL" option. Content is unfiltered with respect to an attribute having the "ALL" option. If a user-initiated selection of the select button 260 is received without receiving a user-initiated selection of an option from the list of options 270, the attribute is automatically set to "ALL".

Referring back to FIG. 2, the preset selection indicators 202 and the preset selection controls 204 provide a graphical user interface for operating presets. The preset selection indicators 202 display a subset of the available presets. The preset selection controls 204 control which subset of the available presets is displayed. The preset selection controls 204 include an up arrow control and a down arrow control

to scroll up and down, respectively, in the available presets. As an arrow control is clicked, the available presets scroll such that preset buttons 290, rather than the text therein, visually appear to move.

Presets acts as filters to easily comb through available content for specific, frequently-used material. Presets may be used to store access to specific content or titles, or may be used to specify sets of titles. For example, a first preset can specify a set of all stations that broadcast jazz, and a second preset can specify all recordings of a particular artist. Presets are available as preferences to users of the same client apparatus, and are available across different client apparatus with the use of a smart card (either physical or virtual).

A different set of presets exists for each content category (radio, events, library, and music). If desired, each content category can have a predetermined number of presets (such as twenty, for example) associated therewith. In general, a preset made for a particular content category may not appear as a preset for another content category.

Alternatively, presets can be used across more than one content category, such as for all content categories. In this case, each preset can be assigned a priority within a content category. A border color for a preset selection indicates the content category to which it refers.

A preset can be stored by dragging the cursor from the selection attribute indicators 214 to a preset title bar 292 when a title is active. In this case, the set of attributes is stored in a next available preset. If no presets are available, the end user is prompted to overwrite a preset or to abandon the request to store the preset.

Another way to store a preset is to click and hold one of the preset selection indicators 202 for a duration that exceeds a predetermined threshold. In a preferred embodiment, the predetermined threshold is about one second. Thereafter, a window is displayed to query if the end user wants to store attributes to the selected one of the preset selection indicators 202, or to delete a preset associated with the selected one of the preset selection indicators 202. The attributes are stored in response to a first user-initiated action using the window. The preset is deleted in response to a second user-initiated action using the window.

A further way to add a preset is by a user-selection of an attraction from the attractions window 240. The attractions window 240 provides rotating attractions in the form of presets. The attractions can include advertisements for content. The end user can click on an attraction to add its associated preset to the presets.

Optionally, controls can be provided to rearrange stored presets, and to select either a set of attributes or a specific station or title to store as a preset. As another option, the presets can have functionality that supercedes any function change so that a specific preset is active throughout the entire system. These presets also can be rearranged by the end user.

Displayed within each of the preset selection indicators 202 are two lines of text with twelve characters per line. For a radio station preset, the text includes call letters and a frequency of the radio station. For an event preset, the text includes as much of an event title that can fit within its preset selection indicator. For a library preset and a music preset, the text includes the first twenty-four letters of the title. With use of the smart card (either physical or virtual), a user is provided an option to edit the titles.

FIG. 4 is an illustration of an embodiment of the streaming indicator 216. The streaming indicator 216 is displayed

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whenever an encoded stream is being decoded in accordance with a streaming technique. The streaming indicator 216 provides a bar graph display representing a percentage of the encoded stream being decoded. In essence, the streaming indicator 216 provides a streaming strength meter showing how close decoded audio is to original audio encoded in the stream.

Also, the streaming indicator 216 provides an indicator of player activity through a resulting flickering thereof. When transmission of data via the electronic network 100 is stalled, one segment 300 of a plurality of segments 302 is displayed in a first color, such as red. When the electronic network is not congested, two or more of the segments 302 are displayed in a second color, such as green.

The streaming indicator 216 also includes two textual indicators 304 and 306 to the right of the segments 302. The textual indicator 304 indicates whether the audio signal is separated into stereo channels. The textual indicator 306 indicates a transportation mode for receiving the encoded stream.

With an activated help mode (as subsequently described in detail), the streaming indicator 216 provides a control to receive a user-initiated action to display transmission statistics. For example, upon clicking the bar graph, the percentage of the encoded stream used to generate the bar graph is displayed in a numerical form. The numerical form of the percentage is repeatedly updated for a duration of about three seconds. Thereafter, the numerical form is replaced with the bar graph.

To provide an indication that a stream is beginning and that a buffer is being filled, each function includes a dial or scale. The dial or scale fills from opaque to solid from left to right to indicate how much of the buffer is filled. In this way, the left side of the dial begins filling when buffering begins, and reaches the right side of the dial when buffering has completed. At this time, play of the audio is commenced.

Also, while loading, a textual indication of system action can be displayed. Examples of system actions which can be displayed include, but are not limited to, a "calling server" action and a "loading file" action. If an error occurs when attempting to locate a streaming file, an error message is displayed at the location of the bar graph.

FIG. 5 is an illustration of an embodiment of the volume controls 212. The volume controls 212 include a plurality of like shapes having different sizes. Each of the shapes is dedicated to receive a user-initiated selection to playback the audio with a volume monotonically related to its size. As illustrated, the shapes can include circles having five different radii. In this case, each larger circle commands a louder volume. Muting the volume is commanded by clicking on the smallest circle. Advantageously, the end user can rapidly adjust the volume from soft to loud with having to go to progressively larger circles.

Referring back to FIG. 2, it is noted that the size of the first display window can be adjusted by the end user, if desired. Preferably, the first display window can be fully displayed within a browser window without requiring scrolling. It is also preferred that the player be capable of providing a collapsed mode view of the first display window. The collapsed mode view may expose only the presets, for example. The collapsed mode view is amenable for use as a desktop player.

Preferably, all of the aforementioned controls have a phrase or description associated therewith to provide assistance to the end user. A default in the player is to provide an activated help mode, wherein a phrase or description asso-

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ciated with a control is automatically displayed when a cursor is maintained at the control for a predetermined duration such as a second.

The help mode control 232 is designated to receive user-initiated actions to activate and deactivate the help mode. To deactivate the help mode, the end user selects the help mode control 232. When deactivated, the help mode control 232 is displayed without the question mark. To reactivate the help mode, the end user selects the help mode control 232 again. When activated, the help mode control 232 is displayed with the question mark.

FIG. 6 is an illustration of an example of a portion of the display window upon receiving a user-initiated selection of the radio category control 244. In the radio category, a graphical radio dial 330 is displayed. The graphical radio dial 330 resembles an analog dial for AM and FM broadcasts. A graphical pointer 332 indicates a current position on the graphical radio dial 330. Preferably, the graphical pointer 332 is shaped as a graphical needle.

Above and below the graphical pointer 332 are text boxes 334 and 336 containing information about a radio station at the current position. The information can include call letters 340, a frequency 342, a format 344, and a city of origin 346 associated with the radio station. As the graphical pointer 332 is moved from station to station, the information in the text boxes 334 and 336 is updated accordingly.

If a plurality of radio stations exist close to one another, a number of dashes 350 indicative of how many radio stations exist are displayed. A plurality of marks 352 (each having the form of a half-circle) are used to separate available radio stations. The number of the marks 352 can be limited to a limit such as fifteen, if desired.

If a plurality of radio stations exist at the same frequency, a number of the marks 352 indicative of how many radio stations exist at the frequency is displayed to extend down from the frequency location. For example, if two radio stations exist at a frequency, two half circles are displayed at that frequency. Scanning through these stations present each station sequentially in call-letter alphabetical order.

A radio station which does not transmit over the electronic network 100 may appear in a slot on the graphical radio dial 330 to indicate its existence. To indicate that the radio station does not currently broadcast over the electronic network 100, a message or other indicator is displayed.

Optionally, a city guide corresponding to a city for the radio station can be displayed. For example, if the graphical radio dial 330 provides a radio dial for San Francisco radio stations, an option (not illustrated) can be user-selected to initiate a display of the city guide for San Francisco.

FIG. 7 is an illustration of an example of the graphical radio dial 330 for selecting Internet or other electronic network broadcasts. In this case, the graphical radio dial 330 has indicia to alphabetically sort the Internet broadcasts by an identification text. For example, ESPNNet SportsZone content is located when the graphical pointer 332 is at "E", and C]NET content is located when the graphical pointer 332 is at "C". A text box 360 above the graphical pointer 332 displays the text identifying the audio content (such as "ESPN", for example). A text box 362 below the graphical pointer 332 displays the format and the country of origin of the audio content.

With reference to both FIG. 6 and FIG. 7, the graphical user interface provides multiple ways to navigate to a radio station or an Internet broadcast. One way includes using the selection attribute indicators 214 to select a plurality of stations having chosen attributes, followed by tuning the dial

to one of the stations. Attribute selection is performed in a manner described with reference to FIG. 3. In the radio category, selection of an "ALL" option produces all categories of stations that broadcast on FM from anywhere in the world.

The band attribute field 264 allows the end user to specify which band is to be displayed by the graphical radio dial 332. This is a required attribute to be performed in the first step. The bands include AM, FM, (representing stations that primarily broadcast by AM and FM, respectively) and Internet (representing broadcasts only available from the Internet). The default option is FM.

The category attribute field 262 allows the end user to limit the dial to at least one particular category or format. A plurality of categories or formats can be selected by holding down the shift key while selecting the options. In this way, the end user can repeatedly select options from the list without forcing the attribute selection to move to the next field. Text displayed within the category attribute field 262 includes the first chosen category followed by dots to indicate more than one category.

FIG. 8 is an example illustration of using the location attribute field 266. The location attribute field 266 allows the end user to limit the dial to stations having a specified location. Stations that broadcast on the Internet are dependent upon country only. A list of options 370 for the location attribute is segmented into three fields: city 372, state 374, and country 376. Displayed at the top of the list are headings 382, 384, and 386 which can be selected to initiate an alphabetical sort of the options 370 by city, state, and country, respectively. The current field by which the options 370 are sorted is indicated by underlining its associated heading (e.g. the heading 382 is illustrated as underlined to indicate that the options 370 are alphabetically sorted by city). If, for example, the end user wished to have the options 370 sorted by state, he/she could click on the heading 384.

For options not having an associated state, which can occur for some countries in the world, the field for the state 374 is left blank. These options are displayed at the top of the list of options 370.

A plurality of locations can be selected by holding down the shift key while selecting locations. In this way, the end user can repeatedly select locations from the list without forcing the attribute selection to move to the next field. Text displayed within the location attribute field 266 includes the first chosen location followed by dots to indicate more than one location.

A radio station is automatically played once a station or a set of stations are selected and displayed. A first station, which preferably is the left-most station on the graphical radio dial 330, or a commercial business can determine which station is to be played first if a set of stations is selected.

It is noted that any of the aforementioned attributes can be modified while a station is being played. When the modified attributes do not include the current station, the graphical radio dial 330 is redisplayed without the current station, and playback of the first station on the graphical radio dial 330 is initiated.

A second way to navigate to a radio station or an Internet broadcast using the graphical user interface includes the advance/review controls 206. A user-initiated selection of an advance control 390 advances from a currently active station to a station disposed rightward therefrom on the graphical radio dial 330. A user-initiated selection of a review control 392 changes from a currently active station to a station

disposed leftward therefrom on the graphical radio dial 330. A user-initiated selection of one of the marks 352 navigates to a station associated therewith. Regardless of the manner to which the radio station is navigated, streaming of the radio station is initiated upon its selection.

A third way to navigate to a radio station or an Internet broadcast is to use presets. As described with reference to FIG. 2, the presets are available to access frequently-used radio stations. If the preset attributes include more than one option per attribute, that attribute is used to populate the text of those sets. Each preset button may display up to two items of characteristics which define its associated radio station or group of radio stations.

A fourth way to navigate to a radio station or an Internet broadcast is to use a smart card (either physical or virtual). In addition to or as an alternative to storing preferences, a smart card can be used by a promoter to allow the end user easy or unrestricted access to particular content. When a smart card for a particular station is made active, the station or group of stations is presented within the graphical radio dial 330. If the attribute options include more than one item, that attribute reads the associated text. Any activity controlled by a smart card is represented by an oblique version of the font for displaying a function text label (i.e. the "radio" label in the radio content control 244, the "events" label in the events category control 245, the "library" label in the library category control 246, and the "music" label in the music category control 247). The smart card control 230 displays the title of the smart card.

FIG. 9 is an example of the second display region 222 providing auxiliary information about a particular station. The auxiliary information is displayed in response to receiving a user-initiated selection of the information control 220. The auxiliary information can include a title of a current song being played by the station, an artist associated with the song, an album containing the song, a label for the song, and an image of the album cover art. An option 402 is designated to receive a user-initiated event to display more auxiliary information about the song. An option 404 is designated to receive a user-initiated event to purchase the song or an album containing the song. An option 406 is designated to receive a user-initiated event to display a programming guide.

The auxiliary information can also include promotional advertising provided by the station, such as a logo 410 or another image, and one or more links to related sites on the electronic network. The logo 410 acts as a control to initiate a hyperlink to a destination in the electronic network 100, such as to a home page of the radio station. Another window is opened to present information from the destination.

FIG. 10 is an example of a programming guide in the second display region 222. The programming guide includes a planned schedule of the radio station in a list format. The list includes days of the week and times for the programming. Active content 420 is emphasized with bold typeface. Specific events listed in the programming guide can provide links to archived material. Clicking on or otherwise selecting a link brings the end user to the events category with the attributes populated for an event corresponding to the link. Optionally, the programming guide can accept inputs to display the schedule for other times throughout a day or week. Future events can be scheduled in this way.

When no station is active, the second display region 222 may be used to display an advertisement. The advertisement can be provided as a viewing object while streaming buffering occurs. When there is a period of inactivity for the

player, the second display region 222 can resume displaying advertising for a station or another business entity.

It is noted that the radio category can optionally provide additional functionality not specifically illustrated in the drawings. Examples of additional functionality include: (i) a call button in the main area of the interface to initiate an Internet telephone call between the client apparatus 106 and the radio station; (ii) options to support a chat room among listeners of a radio station; (iii) a presentation of player information in languages other than English; (iv) a "show map" option for choosing a location using a graphic representation having mapped zones to represent cities or regions of the country and world; (v) a feedback mechanism to rate the station as a whole, a playlist, a disk jockey, or a current song with a 1 to 10 pick list on a station information screen; and (vi) a comment line that allows the end user to submit text to the station with or without the aforementioned rating.

FIG. 11 is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of the events category control 245. In the events category, a graphical time scale 450 is displayed. A time marker 452 indicates, for an event, a current time position on the graphical time scale 450. The current time position is gauged relative to a time the event occurred. An indication 454 of a time standard or a time zone is displayed to the right of the graphical time scale 450.

An indication 456 is displayed if the event is live. If the event is archived, the indication 456 is replaced by the date that the event occurred.

A start time 460 and an end time 462 on the graphical time scale 450 may be specified in a preference. However, the default is to present the start time 460 and the end time 462 based on the actual occurrence of the event. Alternatively, a timeline indicating an amount of time that the end user has been listening to the event can be displayed. This timeline is preferred in cases where there is an inaccurate record of the original recording.

For live events having an uncertain length (c.g. a sporting event), an estimated timeline is initially displayed. Should the duration of the event go beyond the estimated timeline, an updated timeline is displayed with a start time set to the end time of the estimated timeline.

For an archived event, the time marker 452 can be advanced and reversed using the advance/review controls 206. For a live event, the advance/review controls 206 are not active. To indicate this to the end user, the advance/review controls 206 are displayed in a first color, such as grey, rather than a second color, such as black, for a live event.

The graphical user interface provides multiple ways to navigate to an event. One way includes using the selection attribute indicators 214 to select an event having chosen attributes. Attribute selection is performed in a manner described with reference to FIG. 3. In the events category, selection of an "ALL" option produces a list of all events.

The category attribute field 262 allows the end user to limit the events to at least one particular category or format. A plurality of categories or formats can be selected by holding down the shift key while selecting the options. In this way, the end user can repeatedly select options from the list without forcing the attribute selection to move to the next field. Text displayed within the category attribute field 262 includes the first chosen category followed by dots to indicate more than one category.

FIG. 12 is an example illustration of using the time attribute field 264. The time attribute field 264 allows the

end user to specify a date and a time period at which the event is either scheduled to occur or has occurred. Several options can be made available to specify specific dates. One option is to display a calendar 470 in the first display region 218 for selecting a day or a block of days. A day is selected by navigating the calendar 470 to the day, and clicking on the day. A block of days is selected by clicking on a first date while holding the shift key, and then clicking on the ending date.

FIG. 13 is an example illustration of using the event attribute field 266. Upon selecting the event attribute field 266, a list of events 480 defined by the category attribute field 262 and the time attribute field 264 is displayed. The list of events 480 has a first column to display the name of the event, and a second column to display the date and start time of the event. Displayed at the top of the list are headings 482 and 484 which can be selected to initiate an sort of the events 450 by event name (alphabetically) or by start time (numerically), respectively. The current field by which the events 480 are sorted is indicated by underlining its associated heading (c.g. the heading 482 is illustrated as underlined to indicate that the events 480 are alphabetically sorted by event name). By default, the events 480 are sorted by event name.

A second way to navigate to an event is to use a preset. As described with reference to FIG. 2, some presets are dedicated to access events. If a preset specifies a category attribute and a time attribute rather than an event, the event attribute list is made active upon selecting its preset button. Thereafter, the end user can select an event from the list. If a preset specifies an event, the event will begin to play upon selecting its preset button as soon as the file is available.

A third way to navigate to an event is to select an archived or a scheduled event from a radio station programming guide. In response to receiving a user-initiated selection of an event from the programming guide, the graphical user interface provides the events category. The event attribute field 266 is populated with the selected event. Playback of archived events is automatically initiated. For scheduled events, a prompt to receive a user-initiated selection of a notification method is provided.

FIG. 14 is an illustration of an example of a notification prompt. If an event has not occurred at the time of selection, but is scheduled to occur subsequent to the time of selection, a notification options window 490 is displayed rather than the graphical time line. Although not illustrated, the streaming indicator 216 indicates the status of the event (such as not yet occurred) in this case. Further, the play button 250 is modified to display the word "SCHEDULE" as a confirmation that the event is scheduled. If the end user has not provided scheduling preferences, a prompt to enter the preferences is displayed. The schedule and the preferences are stored to a preferences smart card (either physical or virtual).

The notification options window 490 provides three options. A first option is to send a message to the end user before the event occurs. For example, the message can be sent a predetermined number of minutes before the event. The message can include an electronic mail message sent to the client apparatus 106 or a paging message sent to a pager associated with the end user. A second option is to automatically activate the player, if the client apparatus 106 is activated, at the time of the event. A third option is to record the event for subsequent playback. In this case, the recorded event becomes a preset for later access. Text associated with the preset button is displayed in a bold typeface. If an event



is not yet available, an indication thereof can be provided. If an archive of the event is no longer available, the preset is automatically removed.

It is noted that a personal notification message can be sent to an end user without use of the aforementioned notification prompt. In this case, a notification message is sent to the end user for an event or a program which may be of interest based upon listening behavior or other activity of the end user. Hence, in general, the server 102 can provide personal notification for content that is broadcast at a scheduled time based upon either an expressed interest of the end user (e.g. through the aforementioned active marking for content using the notification prompt) or a passive interest of the end user (e.g. through monitoring of user activity).

A fourth way to navigate to an event is to use a smart card (either physical or virtual). The smart card can allow access to specific events as promotions, for example. When a promotional smart card is made active, the content specified in the card is used to populate attributes in the player. Any text populated by a smart card is represented by an oblique version of the font for displaying a function text label.

Smarts cards (either physical or virtual) also facilitate access to specific events as part of a playlist. In this case, the end user can specify and save a playlist of events to the smart card. The playlist is used to control the player. The playlist may jump to different selections, in which case the text of the selection is presented in an oblique font. It is noted that the playlist information stored can be separate from a physical or a virtual smart card. For example, the playlist information can be stored by the storage device 116 of the server 102 or by the storage device 132 of the client apparatus 106.

FIG. 15 illustrates an example of the second display region 222 displaying auxiliary information about an event. The auxiliary information is displayed in response to receiving a user-initiated selection of the information control 220, which includes the text "EVENT INFO" for events.

The auxiliary information is dependent upon the type of the event. Examples of default information include an original time of the event, a location, guests, and topics. For example, with a sporting event, the auxiliary information can include team logos 500 and 502, a current score for the sporting event, players, hosts, guests, and links to sites related to the event. Linking to one of the sites causes another window to be opened.

It is noted that the events category can optionally provide additional functionality not specifically illustrated in the drawings. Examples of additional functionality include: (i) substituting the event attribute field 266 with a different attribute field, such as a location attribute field, and providing a time line with marks representing the union of events; (ii) temporally arranging events on the timeline so that an event can be selected in a manner similar to the graphical radio dial (allowing the end user to rapidly alternate between two selections); (iii) inserting advertising in the form of markers at predetermined locations along the time scale (allowing the end user to go to another site when there is a pause in the event without losing track of where they are in the event); (iv) a feedback mechanism to rate the event as a whole, the subject of the event, a particular participant in the event, or the broadcast of the event with a 1 to 10 pick list on an event information screen; and (v) a comment line that allows the end user to submit textual feedback with or without the aforementioned rating.

FIG. 16 is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection

of the library category control 246. In the library category, a graphical time scale 520 is displayed. A time marker 522 indicates a current time position, for a library content selection, on the graphical time scale 520. The graphical time scale 520 represents a total time 524 for the selection. The time marker 522 can be moved manually using the pointing device or can be moved using the advance/review controls 206.

The graphical user interface provides multiple ways to navigate to content in the library category. A first way includes using the selection attribute indicators 214 to select content having chosen attributes. Attribute selection is performed in a manner described with reference to FIG. 3. In the library category, selection of an "ALL" option produces a list of all library content.

The category attribute field 262 allows the end user to limit the library content to at least one particular category or format of spoken audio. A custom attribute allows a plurality of categories or formats can be selected by holding down the shift key while selecting the options. In this way, the end user can repeatedly select options from the list without forcing the attribute selection to move to the next field. It is noted that categories can be specialized with options such as best sellers and reviews.

The author attribute field 264 allows the end user to specify an author of the content. Work that is absent of an author (such as non-book material) can have a lead person in the work listed as an author. Upon selecting the author attribute field 264, a list of authors having content limited to the category specified in the category attribute field 262 is displayed. The end user can select an author from the list.

Upon selecting the title attribute field 266, a list of titles that satisfy the parameters specified in the category attribute field 262 and the author attribute field 264 is displayed. The end user can select a title from the list.

FIG. 17 shows an example of text in the fields 262, 264, and 266 associated with the aforementioned approach to navigating to library material. When information in a field is longer than the width of the field, the full text of the information is available by maintaining a cursor on the field. In response to this user-initiated event, the width of the field is expanded to accommodate the full text.

A second way to navigate to library content is to use a preset. As described with reference to FIG. 2, some presets are dedicated to the library section. Upon selecting a preset button, attributes specified by its corresponding preset are used to populate the attribute fields 262, 264, and 266. If the preset defines a set of titles, the user can select one of the titles using the title attribute field 266.

A third way to navigate to library content is to use a smart card (either physical or virtual). The smart card is used to populate attributes in the player. Thereafter, the user is presented with the content cued and ready to play, or is presented with a list of titles to select from. The smart card can allow access to otherwise unavailable content that is made available through privileges stored in the smart card. During smart card operation, the Library function label is displayed using an oblique font.

Smarts cards also facilitate access to specific titles as part of a playlist. In this case, the end user can specify and save a playlist of titles to the smart card. The playlist is used to control the player. The playlist is amenable for transfer between the end user and another end user, and between a plurality of access points for the end user. When an item from a playlist is selected, its attributes populate the attribute fields 262, 264, and 266, and the item is cued for play.

Regardless of the method of navigating to a title, the graphical user interface can provide indicators and controls to provide access to specific chapters or sections of the material in a manner similar to tracks of a compact disk. A time indicator can be displayed at the top of the time scale relative to each particular segment or relative to the time from the beginning of the material. As illustrated in FIG. 18, an indicator 540 of which chapter is current and the number of chapters that exist is displayed at an end of the time line. Clicking on the indicator 540 presents a pick list of chapters.

Cueing to another part of the content can be performed using the advance/review controls 206 to advance through the time bar. When advanced beyond the length of a chapter, a subsequent chapter is provided. Holding down the advance/review controls 206 advances or returns to other chapters.

Alternatively, tags marking specific content on the time bar can be user-selected to advance to specific content. Further, a user-initiated selection of a point on the time line moves the time marker to the point.

Optionally, the time marker can have specially-encoded material associated therewith to allow for users to find specific segments. This is beneficial in educational applications. Another option is to provide titles of chapters rather than chapter numbers in the indicator 540. Links to reviewers or other comments can be embedded in the time scale to allow the end user to pause and reflect on the current material.

FIG. 19 illustrates an example of the second display region 222 being used to provide auxiliary information about a title. The auxiliary information is displayed in response to receiving a user-initiated selection of the information control 220, which includes the text "TITLE INFO" for library content. The auxiliary information can include specific information for the title, a summary of the title, a table of contents, credits, comments on the title, accompanying text, links to reviews of the title, links to related areas, an image 550 of the author(s), and an image 552 of the cover of a book, for example.

It is noted that the library category can optionally provide additional functionality not specifically illustrated in the drawings. Examples of additional functionality include: (i) a feedback mechanism to rate the title as a whole, the author, reading or translation of the title with a 1 to 10 pick list on a library information screen; and (ii) a comment line that allows the end user to submit textual feedback with or without the aforementioned rating.

FIG. 20 is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of the music category control 247. In the music category, a graphical time scale 600 is displayed much like the graphical time scale 520 for the library category. A time marker 602 indicates a current time position for a music selection, such as an album or a song, on the graphical time scale 600. The graphical time scale 600 represents a total time 604 for the music selection. The time marker 602 can be moved manually using a click-and-drag operation with a pointing device or can be moved using the advance/review controls 206.

The graphical user interface provides multiple ways to navigate to content in the music category. A first way includes using the selection attribute indicators 214 to select content having chosen attributes. Attribute selection is performed in a manner described with reference to FIG. 3. In the music category, selection of an "ALL" option produces a list of all music content.

The category attribute field 262 allows the end user to limit the library content to at least one particular category or

format. Traditional categories and formats of music (e.g. rock, jazz, pop, etc.) can be provided. A plurality of categories or formats can be selected by holding down the shift key while selecting the options. In this way, the end user can repeatedly select options from the list without forcing the attribute selection to move to the next field.

The artist attribute field 264 allows the end user to specify an artist of the content. Upon selecting the artist attribute field 264, a list of artists having content limited to the category specified in the category attribute field 262 is displayed. The end user can select an artist from the list.

Upon selecting the title attribute field 266, a list of titles that satisfy the parameters specified in the category attribute field 262 and the artist attribute field 264 is displayed. The end user can select a title from the list. The list of titles can include album titles and song titles.

When information in one of the fields 262, 264, and 266 is longer than the display width of the field, the full text of the information is available by maintaining a cursor on the field. In response to this user-initiated event, the width of the field is expanded to accommodate the full text.

A second way to navigate to music content is to use a preset. As described with reference to FIG. 2, some presets are dedicated to the music section. Upon selecting a preset button, attributes specified by its corresponding preset are used to populate the attribute fields 262, 264, and 266. If the preset defines a set of titles, the user can select one of the titles using the title attribute field 266.

A third way to navigate to music content is to use a smart card (either physical or virtual). The smart card is used to populate attributes in the player. Thereafter, the user is presented with the content cued and ready to play, or is presented with a list of titles to select from.

Smarts cards also facilitate access to specific titles as part of a playlist. In this case, the end user can specify and save a playlist of titles to the smart card. The playlist is used to control the player. The playlist is amenable for transfer between the end user and another end user, and between a plurality of access points for the end user. When an item from a playlist is selected, its attributes populate the attribute fields 262, 264, and 266, and the item is cued for play.

Regardless of the method of navigating to a title, the graphical user interface can provide indicators and controls to provide access to specific tracks, sections, or parts of the music. As illustrated in FIG. 21, an indicator 620 of which track is current and the number of tracks that exist is displayed at an end of the time line. Clicking on the indicator 620 presents a pick list of tracks.

Cueing to another part of the music content can be performed using the advance/review controls 206 to advance through the time bar. Holding down the advance/review controls 206 for more than a predetermined time duration (such as one second, for example) advances or returns to other tracks immediately. A user-initiated selection of a point on the time line moves the time marker to the point.

Optionally, the time marker 602 can have specially-encoded material associated therewith to allow for users to find specific songs or other segments. Another option is to provide titles of songs and/or credits rather than track numbers in the indicator 620. Controls can be provided to allow titles in an album to be rearranged for playback.

Referring back to FIG. 2, the second display region 222 can be used to provide auxiliary information about music content. The auxiliary information is displayed in response to receiving a user-initiated selection of the information

control 220, which includes the text "ALBUM INFO" for music content. The auxiliary information can include specific information for the current title such as album cover graphics, liner notes, tray back images, images of the artist(s), producer and writer credits, and distribution label information, for example.

It is noted that the music category can optionally provide additional functionality not specifically illustrated in the drawings. Examples of additional functionality include: (i) a feedback mechanism to rate aspects of the music such as the artist, the album, a song, and a producer, using a 1 to 10 pick list on a music information screen; (ii) a comment line that allows the end user to submit textual feedback with or without the aforementioned rating; and (iii) an ability to receive, decode, and display streamed music video in the second display region 222.

FIG. 22 illustrates an example of a search feature provided in the second display region 222. The search feature is activated in response to receiving a user-initiated selection of the search control 224. If the user-initiated selection is received while the search feature is active, herein-described search fields are reset.

The search feature receives a user-entered search string. The search string is displayed at a location 630. The search string includes one or more keywords which can have the form of a Boolean expression. A list of keywords can be combined using a "+" character. To limit the selection to one of the keywords, a "-" character precedes the keyword. Generally, the keywords are case insensitive.

Using the search string, a search of a database is performed in dependence upon user-selectable search criteria. The database can be provided by the server 102 and/or the server 144. The search criteria limits where to search in the database for the search string. The search criteria includes fields for the radio category, the events category, the library category, and the music category. Each search criterion can be activated and deactivated using a graphical check box associated therewith. An "x" character is displayed at the graphical check box to indicate that its associated search criterion is activated. As a default, all search criteria are activated.

A first button 632 is responsive to a user-initiated selection to provide further fields to be searched. The first button 632 can be subsequently selected to provide still further fields to be searched. Each additional field provided in response to the first button 632 is activated by default. The end user can deselect the activated fields if desired. A second button 634 is responsive to a user-initiated selection to provide fewer fields to be searched.

The search is performed in response to a user-initiated selection of a button 636. Results of the search are displayed in the second display region 222.

FIG. 23 illustrates an example of search results displayed in the second display region 222. The search results are sorted by category (in the order of radio, events, library, and music). Preferably, items are color-coded in dependence upon its category. Within each category are three attribute headings. Search results within each category can be sorted by an attribute by selecting its associated one of the attribute headings.

A first button 640 is responsive to a user-initiated selection to return to the previously set search fields (including the search string and the search criteria). The end user can modify the search fields to modify the search. A second button 642 is responsive to a user-initiated selection to reset the search fields to perform a new search.

FIG. 24 illustrates an example of a listening booth feature provided in the second display region 222. The listening booth feature is activated in response to receiving a user-initiated selection of the user feedback control 226. The listening booth feature can provide a venue for new music by relatively unknown talent. End users listen to the music, and provide user feedback to a service via the electronic network 100. In return, the service provides the end user with an incentive, such as a complimentary copy of the music, a coupon, T-shirt, or other promotional item. Each end user rates music based upon a user preference parameter, such as a most-listened category for the end user. In general, any audible material can be rated, including but not limited to albums, playlists from radio stations and experimental audible material.

The listening booth feature provides an option 650 to view directions therefor. In response to a user-initiated selection of the option 650, the directions are displayed in the second display region 222. The directions can include example screens to explain use of the listening booth feature.

Upon each return to the listening booth feature, a status of the end user is displayed. The end user is registered at the server 102 through an active preferences smart card. The status can include a number of albums rated by the end user, and/or a remaining number of albums to receive a complimentary album.

The status information includes information about the end user, which may be stored via the preferences smart card. If this information is not present, the user is prompted to make a preferences smart card active or to create a preferences smart card. The preferences smart card provides a method of tracking listening preferences of the end user in order to determine which albums to present in the listening booth feature.

FIG. 25 is an example of a second display for the listening booth feature. The second display is presented upon confirming the identity of the end user, such as by receiving a password in the first display.

The second display provides several categories of music content from which to select. These categories are determined through past listening behavior of the end user. An option 660 can be selected to provide additional, different categories. The option 660 can be repeatedly selected to repeatedly provide more categories.

A user-initiated selection of text or graphics associated with one of the categories is received to select a category. The text can include a radio station associated with the category the end user has a radio preset for the category. The graphics can include an album cover of a typical album in the category.

FIG. 26 is an example of a third display for the listening booth feature. The third display is presented upon a user-initiated selection of one of the categories in the second display.

The third display includes at least one image 670 associated with a music selection from the category. The at least one image 670 can include a slide show based on liner notes, a CD tray back image, or a random image, for example. The third display also includes textual information including an artist, an album, a producer, a label, and a copyright associated with the music selection.

The music selection is loaded into the attributes. Based on user preferences, the tracks can automatically begin playing when queued. The music selection can include samples of a few seconds from each track on an album, for example. During playback, the end user enters a rating using a control

674. The control includes 674 a marker 676 that is manipulated with respect to a numerical scale 680. The numerical scale 680 can run between two numerical limits, such as from 0 to 100.

Upon completion of playing the samples, the user-entered rating is recorded and the music selection is counted as being rated by the end user. If no rating has been entered, no rating is recorded. If the end user exits the listening booth feature during playback, the rating is not recorded. A rating can be canceled by a user-initiated selection of the cancel button 252.

As an alternative to a numerical rating, a graphical representation of rating can be employed. The graphical representation can be repeatedly gauged throughout the music selection. In this way, specific aspects and specific tracks of the music selection can be rated.

Referring back to FIG. 24, a control 690 can be selected by the end user to view previously reviewed albums. FIG. 27 is an example display provided upon selecting the control 690. The display includes a list 692 of each album reviewed by the end user. An album title 694, an artist 696, a copyright 700, a date 702, and an icon 704 are displayed for each album. The icon 704 can be selected to view images and credits, and to hear an audio clip of the samples for its associated album.

An example of a portion of the interface displayed upon selecting the icon is depicted in FIG. 28. As illustrated, the at least one image 670, the textual information 672, the marker 676, and the numerical scale 680 showing the rating are displayed as in FIG. 26. Additionally, a date 720 on which the album was rated is displayed. An option 722 is dedicated to receive a user-initiated event to initiate playback of the samples. An option 724 is dedicated to receive a user-initiated event to return to the previous screen.

Once the number of albums rated by the end user has attained a predetermined number, the end user can request a complimentary copy by selecting any one of the albums in the list. A dedicated button (not illustrated) can be selected to request that the complimentary copy be shipped to an address of the end user.

FIG. 29 illustrates an example of a card organizer display for a smart card feature. The smart card feature is activated in response to receiving a user-initiated selection of the smart card control 230. The card organizer display is displayed within the second display region 222.

There are four types of smart cards (either physical or virtual) that can be used in the system. The four types of smart cards include a preferences smart card, a promotions smart card, a playlist smart card, and a payment smart card.

A preferences smart card or a personality smart card stores identity, demographics, presets, defaults, payment options and preferences, and event schedules for an end user. The preferences smart card is read/write and password protected. Each preferences smart card can be unique for an associated end user of the client apparatus 106. Using a plurality of preferences smart cards, a plurality of individual preferences can be provided for a plurality of end users of the client apparatus 106.

A playlist smart card is a custom card for an individual. The playlist smart card is a collection and organization device for content available via the electronic network 100. The playlist smart card can be used to collect music, library content, events, or radio programming using personalized icons, event schedules, and playlists. Access to some content may be secured using the playlist smart card via a purchase. The playlist smart card can be traded, downloaded, sold,

and/or bartered between two individuals. Typically, the playlist smart card is dedicated to a single function.

A promotions smart card provides privileged access to predetermined events, such as special events. For example, the promotions smart card can bring the end user to a specified location via the electronic network 100 to listen to programmed content. The promotions smart card can be purchased or received free of charge. Typically, the promotions smart card is dedicated for accessing a single function. It is preferred that the promotions smart card be the equivalent of a read-only playlist smart card.

A payment smart card provides a means for paying for content. The payment smart card can store billing information for content purchases absent of credit card information. The ability to purchase or rent content may allow the end user to gain access to new releases or obscure content.

The card organizer display includes a first portion 730 dedicated for preferences smart cards, a second portion 732 dedicated for playlist smart cards, and a third portion 734 dedicated for promotions smart cards. Only three portions are displayed because the payment smart card provides part of the preferences for the end user.

Each of the first portion 730, the second portion 732, and the third portion 734 includes one or more card icons (a respective one being indicated by reference numeral 736). Each of the card icons is user-selectable to select an associated smart card for further action. Each card icon can be selected using a point-and-click operation, or by using one of up scroll controls 740 and one of down scroll controls 742.

Upon clicking on or otherwise selecting a card icon such as the card icon 736, a step of displaying a cover and/or a description of the associated smart card is performed. To view the contents of the smart card, the associated card icon 736 is dragged and dropped to a fourth portion 750 of the display. The fourth portion 750 includes a graphical representation of a card slot 752.

FIG. 30 is an example portion of the interface displayed in response to the aforementioned drag-and-drop operation. For purposes of illustration and example, a preferences smart card associated with the card icon 736 was dragged and dropped to the fourth portion 750. In response to this operation, a graphical card 760 is displayed within the card slot, a textual name 762 of the smart card is displayed in an oblique font within a graphical tab 764, and the contents of the smart card are displayed over the first portion 730, the second portion 732, and the third portion 734 in FIG. 29.

The textual name 762 in the graphical tab 764 indicates which smart card is active. A function of the player being controlled by the smart card is also displayed in an oblique font. The textual name 762 includes up to fifteen characters of the smart card name. The smart card name can include up to two lines of text to describe the smart card. If the smart card name has more than fifteen characters, the first fifteen characters are displayed, followed by a series of dots.

The preferences smart card has three areas that can be viewed and/or edited. The three areas include an identity area, a defaults area, and a payment options area. A first graphical button 770 is dedicated to receive a user-initiated action to access the identity area. A second graphical button 772 is dedicated to receive a user-initiated action to access the defaults area. A third graphical button 774 is dedicated to receive a user-initiated action to access the payment options area.

As illustrated, FIG. 30 shows a display of the identity area. The identity area includes a plurality of fields to store

identity information. The fields can include fields for login information, password information, name information, address information, city information, and an electronic mail address.

FIG. 31 shows a display of the defaults area initiated upon selecting the second graphical button 772. The defaults area includes information on how to handle specific actions, such as whether to automatically play a selected title from the radio content category, the events content category, the library content category, and the music content category.

FIG. 32 shows a display of the payment options area initiated upon selecting the third graphical button 774. The payment options area includes a shipping address and a billing address. The payment options area also provides an option 780 for the end user to type a credit card number in order to make a purchase. It is noted that the credit card number is not stored to the player.

With reference to each of FIGS. 29 to 32, an edit button 790 can be selected to edit any of the information associated with the smart card. A cancel button 792 can be selected to cancel the edit. A save button 794 can be selected to save the edited fields. A warning message can be provided to prompt the end user to save edited fields upon an attempt to exit. The end user can reject the warning to cancel all editing activity with the smart card.

FIG. 33 is an example portion of the interface displayed in response to a drag-and-drop operation of a playlist smart card to the fourth portion 750. A playlist 800 of a plurality of items is displayed in response to the drag-and-drop operation. The playlist 800 is specific to a predetermined content area. Items can be selected from the playlist 800 for automatic playback, or can be selected using the selector.

Items can be added and deleted from the playlist 800. To add an item, the material is selected using the browser, followed by a selection of the save button 794. Clicking on or otherwise selecting the save button 794 saves all qualifying radio stations, events, or titles to the playlist smart card. Although items can be added and deleted, contents of items within the playlist smart card are not user-editable.

FIG. 34 is an example portion of the interface displayed in response to a drag-and-drop operation of a promotions smart card to the fourth portion 750. The promotions smart card is similar to a playlist smart card. However, items within the promotions smart card cannot be added, deleted, or edited. Items can be selected from the promotions smart card for automatic playback, or can be selected using the selector.

With reference to FIGS. 30 to 34, a graphical button 810 can be selected to send smart card information in an electronic mail message. Virtual smart card information, stored as a file in the client apparatus 106, is transmitted as a file in the electronic mail message. The electronic mail message can be communicated to another of the plurality of client apparatus 104 via the electronic network 100. If there are unique privileges for the smart card, the smart card information can be deleted at the sending apparatus. Alternatively, communication of the smart card information can be inhibited if there are unique privileges.

A new smart card is created by selecting a graphical button 820 when no smart card is active. In response to receiving a selection of the graphical button 820, a list of options is displayed. The options include an option to create a preferences smart card, an option to create a playlist smart card, and an option to obtain a smart card from an incoming electronic mail message. For a smart card created from an incoming electronic mail message, the type of smart card is

dependent upon the type of smart card used to generate the electronic mail message.

By selecting the option to obtain the smart card from an electronic mail message, a directory of possible virtual cards is displayed. The end user can browse the directory to find and select a virtual smart card of interest.

Each of the smart card categories can have a limited number of smart cards. For example, each of the playlist category and the promotions category can be limited to ten smart cards, and the preferences category can be limited to five smart cards. If the limit has been attained, the graphical button 820 is displayed in a second color such as grey rather than black.

The contents of the active smart card can be deleted by selecting a graphical button 822. A message confirming that the contents are to be deleted (such as "are you sure") is displayed prior to deleting the contents.

A graphical button such as an icon 824 can be user-selected to de-select the active smart card in the card slot. The icon 824 includes a graphical eject button. In response to a user-selection of the icon 824, the graphical card 824 is removed from the fourth portion 824, and the formerly active smart card is returned to its position. A graphical button such as an icon 826 can be user-selected to return to the display of the card organizer. The icon 826 graphically resembles a file folder. It is noted that the active smart card remains active in response to selecting the icon 826.

As described with reference to FIG. 1, the player 142 can provide a second visual interface having a collapsed view. Preferably, in the collapsed view, the tabs for the lower portion of the window including the information control 220, the search control 224, the user feedback control 226, and the smart card control 230 remain visible. A user-initiated selection of any of the controls 220, 224, 226, and 230 directs the player to open the second display region 222, and to initiate a feature associated therewith.

FIG. 35 is a screen shot of a first embodiment of the graphical user interface in the radio content mode. The default radio station indicated by the graphical marker 332 on the graphical radio dial 330 begins playing upon its selection.

As with the previously-described embodiments, the interface includes the categorical selection controls 244, 245, 246, and 247, the preset selection indicators 202, the preset selection controls 204, the advance/review controls 206, the playback controls 210, the volume controls 212, the selection attribute indicators 214, the streaming indicator 216, the first display region 218, the information control 220, the second display region 222, the search control 224, the user feedback control 226, the smart card control 230, the help mode control 232, the first logo 234, the second logo 236, the advertising window 240, and the attractions window 242. The user feedback control 226 provides access to chat features in this embodiment.

FIG. 36 is a screen shot showing a content selection interface in the first preferred embodiment. A window 850 opens upon clicking the select button 260 or any of the attributes that define the dial at the time.

FIG. 37 is a screen shot of a second preferred embodiment of the graphical user interface. The second preferred embodiment may be programmed in a markup language such as HTML, in comparison to the first preferred embodiment which may include plug-in-specific code to provide animation (such as Shockwave code).

A radio dial 870 spatially displays the band and location of all available stations that match selected criteria. A station

pick list 872 allows for a user selection of all stations from the radio dial 870. A banner 874 displays banner advertisements that rotate in accordance with a predetermined schedule. A region 876 displays logos and attractions that rotate in accordance with a predetermined schedule. A selection area 880 provides categorical selection controls and player function controls. A region 882 displays streamed and clickable text that can include attractions and advertisements. An information space 884 displays supplementary information about the current content, including schedules, links to other destinations and feedback. A control panel 886 indicates and controls play, pause, volume, and streaming status. A region 890 is dedicated for entering a keyword to perform a search for content using a single click. A region 892 is dedicated for display and management of presets with one set of presets per end user.

FIG. 38 is a screen shot of the second embodiment in a radio player mode. Upon receiving a user-initiated selection of a selection attribute (band, category, or location) in the selection area 880, a pick list 894 of available options is populated from a database. To speed in the process of selecting material, the interface is absent of a submit button. Therefore, as soon as the end user releases a mouse button over an item in the pick list 894, the item is selected.

FIG. 39 is a screen shot of the second embodiment in an events player mode. Radio buttons 896 indicate a current position within an event or another time-based selection relative to an entire length of time. Selecting events, spoken audio, and music is facilitated in the selection area 880. Upon selecting a content category (either live events, spoken audio, or music collection), the end user is prompted to select two attributes to narrow or filter the content to list of manageable length.

It is noted that embodiments of the graphical user interface can change in a region-dependent manner (e.g. dependent upon the location of the client apparatus 106). For example, the FM broadcast spectrum (which differs for different regions in the world) can depend upon the location of the client apparatus 106. Further, textual information can be displayed in one of a plurality of languages in dependence upon the location of the client apparatus 106.

It is also noted that alternative controls can be provided to control settings and parameters of the herein-described embodiments of graphical user interfaces. These graphical controls include, but are not limited to, graphical buttons, checkboxes, radio buttons, scroll bars, slider bars, pop-up menus, and dialog boxes. Further, alternative indicators can be provided to display information in embodiments of the graphical user interfaces.

Other options that can be included in embodiments of the present invention are as follows.

A physical login card can be sent to a new end user after each login creation. The physical login card can allow for advertisements that transcend the content (e.g. regularly scheduled programming or collections).

Prior to initiating playback or providing a login screen, a tip-of-the-day can be provided to promote features of the graphical user interface.

An event-of-the-day or a feature-of-the-day can be broadcast for display at the second display region 222. In response to a click operation or another user-initiated action, other information can be displayed in the second display region 222.

A station-of-the-day can be broadcast for display in a manner similar to the aforementioned feature-of-the-day. A list of featured stations based on sets rather than individual stations can be provided (e.g. a famous individual's favorite stations).

A music critic feature allows end users to comment on music and other content to create a collaborative filtering product.

A special preset such as a mystery preset of the day can be provided in the set of presets. This preset can be the first preset in the set, for example.

Presets can have expiration dates. For example, an events preset may expire after a predetermined expiration date.

An advertising slot machine can be provided. The advertising slot machine can be provided by a JAVA applet that rotates attractions as a slot machine in the advertising window 240. The attractions can be rotated randomly. If three like advertisements align, the end user can win a prize.

A separate attractions window can be provided. In this case, the end user can click on an image associated with content to retrieve information for the content. An option to play or not to play the content is provided to the end user. The end user can make his/her decision to play or not to play based upon the information.

Alternative content can be transmitted in cases such as a blackout period or when there is a technical difficulty.

FIGS. 40A and 40B are flow charts of an embodiment of a method of providing the graphical user interface. As indicated by block 900, steps of verifying that necessary components are installed at the client apparatus 106 and offering system choices to an end user are performed. As indicated by block 902, a step of determining if a smart card (physical or virtual) identifying the end user is present at the client apparatus 106.

If the end user is a recognized user (block 904), then a step of entering a password (block 906) or a step of entering a login and a password (block 910) is performed. Thereafter, a main page of the graphical user interface is provided (block 912). Upon completion of the player, an exit message is communicated (block 914) to the client apparatus.

If the end user is an unrecognized user (block 916), then a step of entering a login and a password (block 920) is performed. Thereafter, a main page of the graphical user interface is provided (block 922). Upon completion of the player, an exit message is communicated (block 924) to the client apparatus.

If the end user has previously visited without logging in (block 926), then either a step of creating a login and a password (block 930) or a step of selecting a visiting mode (block 932) is performed. If a login and a password are created (block 930), a main page of the graphical user interface is provided (block 934). Upon completion of the player, an exit message is communicated (block 936) to the client apparatus.

If the visiting mode was selected (block 932), a main page of the graphical user interface is provided (block 940). Upon completion of the player, a first exit message is communicated (block 942) to the client apparatus. The first exit message provides options to save or not to save preferences generated during a session of the player. If an option to save the preferences is selected (block 944), steps of creating a login/password profile (block 946) and returning to the main page (block 950) are performed. Thereafter, upon completion of the player, a second exit message is communicated to the client apparatus (block 952). If an option to not save the preferences is selected (block 954), a second exit message is communicated to the client apparatus (block 956).

If the end user is a first time user (block 960), then a step of creating a login and a password (block 962) and a step of providing a main page of the graphical user interface (block

964) are performed. Upon completion of the player, an exit message is communicated (block 966) to the client apparatus 106.

If the end user is a first time user who selects a visiting mode (block 970), a main page of the graphical user interface is provided (block 972). Upon completion of the player, a first exit message is communicated (block 974) to the client apparatus. The first exit message provides options to save or not to save preferences generated during a session of the player. If an option to save the preferences is selected (block 976), steps of creating a login/password profile (block 980) and returning to the main page (block 982) are performed. Thereafter, upon completion of the player, a second exit message is communicated to the client apparatus (block 984). If an option to not save the preferences is selected (block 986), a second exit message is communicated to the client apparatus (block 990).

If an invalid login and/or password is received in any of the above-described steps of receiving a login and a password, a message is communicated to the client apparatus 106. The message can include a message such as "Invalid Login/Password" and/or "Please Try Again". Thereafter, a step of receiving another login and password can be performed.

If a blank text entry field is received, a message is communicated to the client apparatus 106. The message can include a message such as "Please fill in all text fields". Thereafter, a step of receiving subsequent textual data can be performed.

The step of creating a login provides a dialog to query for demographic and listening preference information from the end user. The end user enters information in response to the queries. Typically, the information is entered during an initial use of the player, such as upon an initial arrival at a Web site associated with the player. The initial arrival at the Web site can be initiated by the end user clicking on a banner advertisement or another hyperlink from another Web site.

The information is retrieved for each subsequent visit or use to uniquely identify the end user, and to tailor the graphical user interface and/or the playback performed thereby to the end user. Further, the information allows listening habits, such as radio stations and music tastes, to be tracked.

FIGS. 41 to 43 are block diagrams summarizing a site map for an embodiment of the graphical user interface. The site map illustrates potential user-selectable flow paths between different features of the graphical user interface.

The end user can select between a high bandwidth interface (block 1010) and a low bandwidth interface (block 1012) for the audio player. For example, the high bandwidth interface may include code specific for an animation plug-in, such as Shockwave, whereas the low bandwidth interface may include only HTML code. Thereafter, a main page of the interface is provided in accordance with the user-selected bandwidth.

From the main page, the end user can navigate to a radio content feature (block 1014), an events content feature (block 1016), a library content feature (block 1020), a music content feature (block 1022), a rating room (or listening booth) feature (block 1024), a preferences feature (block 1026), a features feature (block 1030), a search feature (block 1032), and a contact feature (block 1034).

Using the radio content feature (block 1014), a radio station can be selected (block 1040), station information can be obtained (block 1042), and a radio preset can be selected (block 1044). Thereafter, a link to related Web site can be

provided (block 1050), a list of station programs can be provided (block 1052), and station feedback can be received (block 1054).

Using the event content feature (block 1016), an event can be selected (block 1060), event information can be obtained (block 1062), and an event preset can be selected (block 1064). Thereafter, a link to related Web site can be provided (block 1070), an event schedule can be provided (block 1072), and event feedback can be received (block 1074).

Using the library content feature (block 1020), library content can be selected (block 1080), library content information can be obtained (block 1082), and a library content preset can be selected (block 1084). Thereafter, a link to related Web site can be provided (block 1090) and content feedback can be received (block 1094).

Using the music content feature (block 1022), music content can be selected (block 1100), music content information can be obtained (block 1102), and a music content preset can be selected (block 1104). Thereafter, a link to related Web site can be provided (block 1110) and content feedback can be received (block 1114).

Using the rating room feature (block 1024), a welcome message and a registration process is provided (block 1120). Once the end user is registered, an overview of the rating room feature can be displayed (block 1130), an album can be selected in dependence upon a user-selected genre (block 1132), the album can be rated by the end user (block 1134), the information associated with the album can be displayed (block 1136), and an exit message can be displayed (block 1140) upon exiting the rating room feature. Further, a status of the end user's cumulative rating points can be displayed (block 1142), points can be redeemed (block 1144), a list of albums to receive in return for the points can be displayed (block 1146), an album from the list can be selected (block 1150), and an exit message can be displayed (block 1152).

Using the preferences feature (block 1026), presets can be managed (block 1160), and a profile can be displayed and edited (block 1162).

FIG. 44 is a flow chart summarizing steps performed in an embodiment of a method of playing first audio content using a computer. As indicated by block 1200, a step of displaying a graphical radio dial indicating the first audio content is performed. As described earlier, the graphical radio dial can include an alphabetical scale and a graphical pointer. In this case, the graphical pointer can be positioned with respect to the alphabetic scale based upon text identifying the first audio content. Alternatively, the graphical radio dial can indicate an over-the-air frequency associated with the first audio content. In this case, the graphical radio dial can include a numerical scale and a graphical pointer, wherein the graphical pointer is positioned with respect to the numerical scale based upon the over-the-air frequency.

Optionally, the method includes a step of receiving a user-initiated selection of the first audio content from a plurality of audio content using the graphical radio dial (as indicated by block 1202). The step of receiving the user-initiated selection can include receiving a user-initiated action to navigate to the first audio content from second audio content adjacently indicated by the graphical radio dial.

As described earlier, the graphical radio dial can include a plurality of marks associated with a plurality of audio content having at least one attribute. For broadcasts, the at least one attribute includes at least two of a category attribute, a band attribute, and a location attribute. The band attribute can indicate one of an AM band, an FM band, and

an Internet band for broadcasts. Optionally, a step (block 1204) of receiving a user-initiated selection of a preset associated with the at least one attribute is performed.

The plurality of marks includes a first mark associated with the first audio content. In this case, the step of receiving the user-initiated selection of the first audio content can comprise steps of receiving the at least one attribute, determining the plurality of audio content based upon the at least one attribute, and receiving a user-initiated selection of the first mark.

As indicated by block 1206, a step of receiving data via an electronic network is performed. The data encodes the first audio content. If the data includes streamed data received via the Internet, the method further comprises the step of decoding the streamed data, as indicated by block 1210. As indicated by block 1212, a step of playing the first audio content is performed.

FIG. 45 is a flow chart summarizing steps in an embodiment of a method of obtaining user feedback to music content. As indicated by block 1240, a step of receiving a category of music content selected by an end user is performed. Optionally, a step of displaying a plurality of categories of music content is performed (block 1242) prior to the step indicated by block 1240. In this case, the category of music content is selected by the end user from the plurality of categories. As another option, a step of determining the plurality of categories based upon a listening behavior of the end user is performed. A further option is to have the plurality of categories be dependent upon at least one preference of the end user.

As indicated by block 1244, a step of communicating at least a portion of a music item within the category to the end user is performed. The music item is selected within the category independent of the end user. If the music item includes an album including a plurality of songs, the step of communicating at least a portion of the music item can include communicating limited duration samples of the plurality of songs.

As indicated by block 1246, a step of receiving a rating of the music item by the end user is performed. As indicated by block 1250, a step of accounting for the rating of the music item by the end user is performed. The step of accounting for the rating of the music item can include maintaining a count of music items rated by the end user. In this case, the method can further comprise the step of determining if the count attains a threshold. This step is performed to determine if the end user has qualified for a complimentary copy of music.

Optionally, a step of displaying a list of a plurality of music items previously rated by the end user is performed (block 1254). The list can include the music item whose rating was received in block 1246. Steps of receiving a user-initiated selection of the music item from the list (block 1256), displaying the rating for the music item (block 1260), and replaying at least a portion of the music item (block 1262) may be performed also.

FIG. 46 is a flow chart summarizing steps in an embodiment of a method of assisting operation of an audio content player. As indicated by block 1270, the method includes a step of displaying a plurality of icons including at least one icon associated with user information and at least one icon associated with playlist information. Optionally, the plurality of icons includes at least one icon associated with privileged access to audio content.

As indicated by block 1272, a step of receiving a user-initiated selection of a first icon from the plurality of icons is performed. The first icon can be associated with at least

one of an actual smart card and a virtual smart card. The step of receiving the user-initiated selection can include receiving a user-initiated drag action of the first icon to a portion of a display. In this case, steps of displaying a graphical card slot at the portion of the display (block 1274) and displaying a graphical card within the graphical card slot in response to the user-initiated drag action (block 1276) can be performed.

As indicated by block 1280, the method includes a step of operating the audio content player in dependence upon first information associated with the first icon. If the first icon is associated with privileged access to audio content, the step of operating the audio content player can include providing privileged access to audio content. If the first icon is associated with playlist information, the step of operating the audio content player can include playing at least a portion of a playlist.

Optionally, the method further comprises the step of modifying the first information associated with the first icon (step 1282). In this case, the audio content player is operated in dependence upon modified first information in block 1280. If the first icon is associated with user information, the step of modifying the first information can include modifying user identity information, modifying a default for automatic playback, or modifying a payment option. If the first icon is associated with playlist information, the step of modifying the first information can include adding an item to a playlist or deleting an item from a playlist.

It is noted that the herein-described methods can be performed by a computer (which may be included with the client apparatus 106 and/or the server 102). Further, the computer can be directed to perform the herein-described methods by computer-readable data stored by a computer-readable storage medium.

FIG. 47 is a screen shot of a third embodiment of the graphical user interface. A radio dial 1300 spatially displays the band and location of all available stations that match selected criteria. A station pick list 1302 allows for a user selection of any of the stations from the radio dial 1300. A banner advertising region 1304 displays banner advertisements that rotate in accordance with a predetermined schedule. An attractions region 1306 displays logos and attractions that rotate in accordance with a predetermined schedule. A selection area 1310 provides categorical selection controls and player function controls. A region 1312 displays streamed and clickable text that can include attractions and advertisements.

An information space 1314 displays supplementary information about the current content, including schedules, links to other destinations and feedback. In general, any visual content can be combined with the audio content for display in the information space 1314. Preferably, the information space 1314 provides a title of the audio content being played (e.g. the title "Shepherd of the Night Flock" of a song being played by the radio station WBEZ), a title and an image of an album containing the audio content (e.g. the album title "Blue Nance"), a name of an artist associated with the audio content (e.g. the name of the performer of the song: "The Junior Mance Trio"), and a name and a logo of an entity associated with the audio content (e.g. a copyright notice for Chiaroscuro Records which is the label for the song, and its logo).

A user-initiated selection of the title of either the album or the image of the album can initiate a display of information associated with the album (e.g. liner notes, performance credits, and other information) and/or a playback of audio samples from the album. A user-initiated selection of the



name of the artist can initiate a display of information associated with the artist. A user-initiated selection of either the name of the entity or the entity logo can initiate a display of information associated with the entity (e.g. information of other albums and audio content provided by the entity). Each of the aforementioned information can be provided either by the server 102 or by hyperlinking to other destinations of the electronic network 100 (e.g. Web pages for the album, artist, and entity).

It is also preferred that the information space 1314 includes an option to buy the audio content being played (e.g. the option "buy now"), an option to display a program guide for the radio station playing the audio content (e.g. the option "program guide" to display information for WBEZ), and an option to provide user feedback (e.g. the option "user feedback").

A control panel 1316 indicates and controls play, pause, volume, and streaming status. A region 1320 is dedicated for entering a keyword to perform a search for content using a single click.

A region 1322 is dedicated for display and management of presets with one set of presets per end user. The region 1322 provides an option to create a new login, i.e. to create a new end user preferences and profile. The region 1322 further provides an option to load preferences associated with an end user.

FIG. 48 is an example of a first display in an embodiment of a listening booth or rating room feature. The rating room feature can be activated in response to receiving a user-initiated selection of the user feedback control 226 or another link thereto. The link can include information indicating an amount of audio items (e.g. music items) to rate and an amount of rating time which are to be satisfied to receive complimentary music. For example, textual information such as "you have 15 days left to rate 6 more CD's in order to choose one free" can be associated with the link.

Preferably, the link is provided in a main graphical page provided by the player. In this case, if the end user sets his/her browser program to an electronic address associated with the player, the main page is displayed upon initiation of the browser program. Additionally, as the main page downloads to the end user, the personal profile of the end user created at an initial login is retrieved. The personal profile uniquely identifies the end user as he/she navigates through the player.

The display includes an option 1330 to display rules and regulations for receiving a complimentary item, such as a complimentary music item. The option 1330 can include, for example, textual information indicating a portion of the rules and regulations such as "Rate 10 CDs and Choose 1 Free".

The display includes an option 1332 to review which audio items have been previously rated by the end user. The option 1332 can include textual information indicating a number of music items previously rated by the end user. For example, the textual information can include "4 albums rated towards free CD". Alternatively, the option 1332 can include textual information indicating a remaining number of items to rate before receiving a complimentary item such as a complimentary music item.

The display includes a plurality of options 1334 for categories or genres of music content. For example, the categories can include jazz, classical, alternative rock, country and latin. It is noted that other categories of music content may be displayed in addition to or as alternatives to the aforementioned categories. The categories can be depen-

dent upon the personal profile or preferences of the end user collected when the user profile is created. Alternatively, the categories can be dependent upon the end user's listening behavior using the player. In this case, the categories are selected to best represent the current listening habits of the end user.

An artist name, a title, and a cover art image of an item, such as an album, are displayed for each category. Preferably, the end user does not influence which item is displayed for the category.

FIG. 49 is an example of a second display for reviewing rated items in a preferred embodiment of a listening booth or rating room feature. The second display is provided in response to receiving a user-initiated selection of the option 1332 to review which items have been previously rated by the end user. The second display includes a plurality of item regions. The number of item regions corresponds to a total number of items which must be rated in order to receive a complimentary item. For example, ten item regions corresponding to ten total audio items to rate to receive a complimentary item are illustrated in FIG. 49.

Information associated with each previously-rated item is displayed in a corresponding item region (a representative one indicated by reference numeral 1340). The information can include an artist, a title, an image such as an album cover, and a category for the item. For example, four of the ten item regions have information displayed to identify four previously-rated items for the end user. Each item region corresponding to a previously-rated item includes a user-selectable portion. In response to receiving a user-initiated selection of the portion (such as the album cover), additional information associated with the item is displayed. The additional information can include a complete media file including a complete track list with rating scores for the songs rated, promotional information, liner notes, lyrics, and credits.

Remaining ones of the item regions (a representative one indicated by reference numeral 1342) can be user selected to return to the main selection page (such as in FIG. 48). Rather than item information, the remaining ones of the item regions can have textual information indicating a portion of the rules and regulations such as "rate 10 CDs choose 1 free". For example, six item regions corresponding to six more music items to be rated before receiving the complimentary item are absent of item information in FIG. 49.

FIG. 50 is an example of a third display for rating an item in an embodiment of a listening booth or rating room feature. The third display is provided in response to receiving a user-initiated selection of one of the options associated with categories of music content. For purposes of illustration and example, a user-initiated selection of the option associated with the jazz category in FIG. 48 is considered.

The third display includes information associated with the item to be rated. The information includes the artist (e.g. Earl Hines), the title (e.g. *In New Orleans*), the cover art image, and a label (e.g. Chiaroscuro) for the item. The cover art image is displayed over a larger display region than the cover art image in FIG. 48.

The third display includes a list of a plurality of tracks from the item to be rated. For example, the list can include four tracks (i.e. songs) from the *In New Orleans* album. The end user is required to rate each of the tracks in order to obtain credit for rating the album. It is noted that the album may include additional tracks which need not be rated by the end user.

Each track is identified by textual information such as a title 1350 in the list. Also associated with each track is an

icon 1352 indicating whether the track has been previously rated by the end user. The icon 1352 includes a question mark to indicate that the track is unrated by the end user. If the track has been previously rated, an indication of the rating is displayed in the icon 1352.

The end user selects either a title from the list or its associated icon to commence a rating process for an associated track. In response to receiving a user-initiated selection of a title or an icon, at least a portion of the associated track is communicated to the client apparatus 106. Although an entire portion of the associated track can be communicated, it is preferred that a limited-duration sample of the associated track be communicated. For example, the limited-duration sample can be comprised of a 30-second clip of the associated track.

Preferably, the portion of the associated track is communicated to the client apparatus 106 using streaming technology. The client apparatus 106, in turn, plays back the portion of the associated track for the end user.

A graphical rating tool is displayed either during playback or upon completing playback of the portion of the associated track. The graphical rating tool is used to receive at least one rating for the track. The graphical rating tool can be displayed either in place of the icon 1352 or proximate to the icon 1352.

The third display includes an option 1354 to buy the item. In response to receiving a user-initiated selection of the option 1354, the item is tagged for purchase. Further, the item can be placed in a virtual shopping cart that stores all items tagged for purchase. Thereafter, a check-out option is provided to finalize the purchase of tagged items. A check-out reminder can be automatically initiated if the end user exits from the player while items are tagged for purchase. The check-out reminder can include a visual message or an audible message displayed by the client apparatus 106.

The third display includes an option 1356 to cancel a rating of the current item. In response to receiving a user-initiated selection of the option 1356, the user interface returns to the main selection page (such as in FIG. 48) where the end user can select another item to rate.

FIG. 51 is a view of an embodiment of the graphical rating tool. The graphical rating tool includes a plurality of rating options 1360. Preferably, each of the rating options 1360 has the form of a hot region associated with a rating. For example, the rating options can include five hot regions for receiving ratings from one to five.

During playback of the track, the end user varies a position of a cursor 1362 over the rating options to indicate his/her dislike or like of the track. For example, the end user may position the cursor 1362 over the hot region for a one-rating during portions of the track he/she dislikes, and may position the cursor 1362 over the hot region for a five-rating during portions of the track he/she likes. Preferably, a display graphic within the hot region is modified in response to the cursor 1362 being positioned thereon. For example, the display graphic can appear to illuminate (e.g. to light up) in response to the cursor 1362 being positioned on the hot region.

A plurality of ratings generated over time are recorded by the client apparatus 104 and/or the server 102. The time sequence of the plurality of ratings can be formed by repeatedly sampling the rating for either equal or unequal time intervals.

When the end user has formulated an overall rating or a score for the item as a whole, he/she points to and clicks on a particular rating option. An indication of the overall rating

is recorded and displayed. Preferably, the overall rating is displayed within the icon 1352 associated with the track. The title 1350 and the icon 1352 for rated tracks are displayed in a second color which differs from a first color used to display titles and icons for unrated tracks.

FIG. 52 is an example of a modified third display, in an embodiment of a listening booth or rating room feature, once all of the tracks for an item have been rated. The modified third display includes indications of the overall ratings for the tracks. The third display is modified to include an option 1370 to submit the ratings. Before submitting the rating scores, the end user is provided an opportunity to re-rate any of the tracks by selecting (e.g. pointing to and clicking on) either its associated title or its rating score icon.

FIG. 53 is an example of the second display, in an embodiment of a listening booth or rating room feature, updated based upon a submission of ratings for the item. Information associated with the item is displayed in a corresponding item region 1380. The information can include an artist, a title, an image such as an album cover, and a category for the item. Hence, five of the ten item regions have information displayed to identify five previously-rated items. As described with reference to FIG. 49, remaining ones of the item regions can be user selected to return to the main selection page. However, the category or genre of music associated with the item is removed from the main selection page. The category or genre can be removed until a predetermined number of users have provided ratings therefor. For example, the category or genre can be removed until ratings have been received from at least hundred other end users or more.

Also as described with reference to FIG. 49, a user-initiated selection of the image, such as the album cover, initiates a display of additional information associated with the item. An example of the display of additional information is depicted in FIG. 54.

FIG. 54 is an example of a fourth display in an embodiment of a listening booth or rating room feature. The fourth display is displayed in response to receiving a user-initiated input such as a selection of an album cover image.

The fourth display includes a banner region 1390, a cover art region 1392, a controls region 1394, and an information region 1396. The banner region 1390 includes a service icon, textual information indicating the category or genre of the item (e.g. "Jazz"), and an option 1400 to return back to the category selection page. The option 1400 can include textual information indicating a number of music items previously rated by the end user. For example, the textual information can include "5 albums rated towards free CD". Alternatively, the option 1400 can include textual information indicating a remaining number of items to rate before receiving a complimentary item such as a complimentary music item.

The cover art region 1392 includes information identifying the item. The information includes the artist (e.g. Earl Hines), the title (e.g. *In New Orleans*), the cover art image, and the label (e.g. Chiaroscuro) for the item. In response to a user-initiated selection of a portion of the cover art region 1392 (such as the album cover), a larger, higher-resolution image of the cover art is displayed. This allows the end user to print a hard copy of the cover art for the item.

The information region 1396 is used to display information associated with the item. The information can include a track list with rating scores for rated songs, promotional information, liner notes, lyrics and credits. Preferably, all of the aforementioned information is included in a single media file for the item. This allows the end user to print all of the information at once.

The portion of the information displayed in the information region 1396 is controlled by either a scroll bar 1402 or by controls in the control region 1394. The control region 1394 includes a first control 1404 to initiate a display of the track list, a second control 1406 to initiate a display of promotional information, a third control 1410 to initiate a display of the liner notes, a fourth control 1412 to initiate a display of the lyrics, and a fifth control 1414 to initiate a display of the credits. Each of the aforementioned controls in the control region 1394 is used to jump to a targeted portion of the single media file. The control region 1394 further includes a sixth control 1410 to initiate a purchase of the item (e.g. the option "Buy CD").

Optionally, the album rating page described with reference to FIG. 50 can include an option to provide additional feedback for the item. The option can have the form of a button or control including text such as "tell us more". In response to a user-initiated selection of the option, a detailed rating criteria interface is provided. An example of this interface is depicted in FIG. 55.

Further, the category or genre selection interface described with reference to FIG. 48 can include an option to provide a comparative rating for a plurality of items. The option can have the form of a button or a control. In response to a user-initiated selection of the option, a comparative ranking interface is provided. An example of this interface is depicted in FIG. 56. The comparative ranking interface is advantageous in providing record labels additional feedback for albums such as albums that were successful during their initial rating and albums which receive a marketing push.

FIG. 55 is an example of a fifth display in an embodiment of a listening booth or rating room feature. The fifth display includes a plurality of rating criteria. The rating criteria can be encoded by information associated with the track or song. In this way, each track or song can have its own set of rating criteria. Preferably, an entity such as a record label indicates which rating criteria are to be provided for one of its songs. The entity can select the rating criteria from a checklist of all potential rating criteria.

For purposes of illustration and example, the fifth display provides a graphical interface 1420 to receive and display a vocals rating, a rhythm rating, a brass rating, and a danceability rating from the end user. Each rating is entered using an associated up control and/or an associated down control. Each rating can be numerical, such as integers from one to ten. Each rating is displayed both textually and by a graphical bar chart display.

The fifth display further provides an option 1422 to include additional criteria. In response to a user-initiated selection of the option 1422, a list of all potential rating criteria can be displayed. The end user can select a rating criterion from the list and can enter a rating therefor.

The fifth display further provides an interface 1424 for entering user comments. The interface 1424 can include a text box to allow the end user to enter comments in the form of a textual message.

To submit the additional feedback, the end user selects an option 1426 provided by the fifth display. The option 1426 can include a graphical button having text such as "submit ratings". In response to receiving the user-initiated selection of the option 1426, the additional feedback is recorded by the server 102.

FIG. 56 is an example of a sixth display in an embodiment of a listening booth or rating room feature. The sixth display provides a graphical interface to receive a comparative ranking of a plurality of items. The plurality of items are

typically selected by an entity such as a record label, and not by the end user. The plurality of items may or may not be within a genre or a category of music.

The sixth display includes a plurality of images, such as a plurality of album cover images, associated with the plurality of items. Each image is user-selectable, such as by a point-and-click operation, to initiate playback of audio samples for its associated item. If available, ratings and comments previously submitted by the end user are also displayed in response to the aforementioned user selection.

The sixth display further includes a plurality of display locations for comparatively ranking the plurality of items. Each of the plurality of display locations is responsive to a drag-and-drop operation of one of the plurality of images. For example, an end user can click on a first image 1440, drag the first image 1440 to a first display location 1442, and drop the first image 1440 at the first display location 1442 to indicate that the item associated with the first image 1440 is his/her favorite from the plurality of items. Similarly, the end user can click on a second image 1444, drag the second image 1444 to a second display location 1446, and drop the second image 1444 at the second display location 1446 to indicate that the item associated with the second image 1444 is his/her next favorite from the plurality of items. Once the end user has entered a comparative ranking of the items, the comparative ranking is submitted to the server 102.

Based upon any of the user-generated rating information and comments described herein, the music testing component 152 in FIG. 1 generates and provides reports including the actual data and/or summaries thereof. Each report can be specific to one or more songs associated with an entity such as a record company. The report is communicated to the entity to provide rating information and comments for its music items. The report can be stratified by demographics such as gender, age, occupation, and geographical region of the end users. Each report can be automatically generated either at periodic or predetermined times, or after a predetermined number of end users have rated an item, or upon receiving a request. For example, a report for an item can be automatically generated and communicated to the entity via the electronic network 100 after one hundred end users have rated the item. As another example, a report for an item can be communicated to an entity in response to a request received from the entity via the electronic network 100.

In a particular embodiment, the music testing component 152 and the promotions component 156 function as follows. To initiate music testing, a client supplies an album to be tested (either on CD or another medium), indicates which four tracks are to be tested, identifies a 30-second clip from each track, and provides additional testing information. If desired, this initiation process can be performed on-line via the electronic network 100.

Typically, the client is associated with a promoter of the album such as a record label for the album. Preferably, the client also supplies additional copies of the album for end users who redeem their credits to obtain the album. The additional copies of the album can be supplied by a fulfillment house indicated by the client. The number of additional copies is based upon a required batch size.

The 30-second clips are digitally encoded for streaming, and made available to the server 102. An entry for the music test is made in a database (herein referred to as MusicTestingBatch). The entry (herein referred to as Batch) includes a Universal Product Code (UPC) for the album, a scheduled start date for testing, either a scheduled end date for testing or a scheduled number of testing days, a required

number of responses (batch size), a genre of the album, and descriptive information such as liner notes, credits, and lyrics. The entry is assigned a unique identification code (herein referred to as BatchID). The database includes a client identification code (herein referred to as ClientID) used for billing and report generation purposes. Optionally, data indicating a total number of songs submitted by the client is updated based upon the entry.

Each entry in MusicTestingBatch is assigned a queue position for its genre. To readily identify which album an end user will rate, a batch queue cache stores an active queue position identifier and an associated BatchID for each genre.

The database includes data (herein referred to as BatchResponse) that identifies all of the end users (by their CustomerIDs) that have rated a particular album (using its BatchID). Using this data, a check is performed to ensure that the end user has not previously completed rating of the album identified by the batch queue cache. Alternatively, the check can be performed using data stored in the user profile. In this case, the user profile includes an AlbumID for each album rated by the end user.

If the end user has previously completed rating the album, the queue position is incremented to a subsequent position. The queue position is repeatedly incremented until a previously-unrated album is identified. If all albums in the genre were rated by the end user, a message suggesting that the end user choose another genre is communicated to and displayed by the client apparatus 106.

Once the end user has listened to and scored all of the song samples within the batch, the music testing component 152 registers the response and increments the queue position. To register the response, the music testing component 152 stores the scores in a MusicTestingResponse table and a MusicTestingScore table by CustomerID and BatchID. The MusicTestingScore table tracks user ratings by correlating BatchID, SongID, and CustomerID. Optionally, the AlbumID is stored in the user profile to prevent the album from being rated more than once by the end user. If the end user has not scored all of the samples, no information is stored for the end user.

It is noted that separate MusicTestingResponse and MusicTestingScore tables may not be necessary since the difference between these two tables is that MusicTestingScore has an additional entry per song.

In addition to an entry being made in the MusicTestingResponse table, the customer profile of the end user can be modified based upon the test. If the end user is enabled to receive promotions (e.g. by having a preferred customer profile), the music testing component 152 credits his/her account upon completing the rating. If the end user is unable to receive promotions (e.g. by having a lesser status such as basic customer or guest), no credit is provided to the end user's account. Optionally, each credit has an expiration date after which the credit is purged.

Preferably, a promotions-enabled customer profile maintains a number of testing credits (herein referred to as NumMusicTestingCredits) and a promotion enable date (herein referred to as PromotionEnableDate). The presence of a PromotionEnableDate greater than the current date indicates that the end user has already received a promotional item, and will not receive credit for the test. If the PromotionEnableDate is not present (e.g. if the end user has not received a promotional item) or if the PromotionEnableDate is less than the current date, then the end user is eligible to receive credit for the test. In this case, the number of testing credits is incremented upon performing the test.

Additionally in this case, an entry is made in a promotions database (herein referred to as PromotionResponseAlbumsPresented). The entry includes the BatchID, the CustomerID, and a false value is assigned to a flag (herein referred to as PromoUsedFlag). The entry indicates that the end user has tested the item and that the item can be used for a promotion.

If the accumulated number of testing credits for the end user attains a threshold, a promotional item such as a CD is offered to the end user. The end user is allowed to select the promotional item from a plurality of promotional items having a false PromoUsedFlag in the promotions database. It is noted that each promotional item can have a limited duration of availability based upon its scheduled end date.

The promotions component 156 receives a response (accept or reject) from the end user. If the end user accepts an item, the following steps are performed. A flag (herein referred to as SelectedFlag) associated with the item is set to true in the promotions database. Information in the customer profile needed to distribute the item to the end user (e.g. a name and a shipping address or an electronic mail address) is forwarded to the fulfillment house. Using the information, the fulfillment house can deliver a physical copy of the item or can deliver an electronic copy of the item via the electronic network 100. The number of testing credits is reset to zero. The PromotionEnableDate is set to a date equal to a predetermined time duration beyond the current date. As a result, the end user can continue rating items after the accumulated number of credits has attained the threshold, however, credit accumulation for the end user is inhibited for the predetermined time duration. The PromoUsedFlag is set to true for all entries associated with the CustomerID of the end user in PromotionResponseAlbumsPresented. This step assures that the same albums are not presented to the end user in a subsequent promotion.

If the end user rejects receiving an item (e.g. by not selecting an item from a list of available items), the following steps are performed. The number of testing credits is reset to zero. The PromoUsedFlag is set to true for all entries associated with the CustomerID of the end user in PromotionResponseAlbumsPresented. As a result, the end user has forfeited his/her credits, and may not select from these items in a subsequent promotion. However, the PromotionEnableDate is maintained so that the end user's ability to acquire credits is not affected.

After a promotion transaction is completed (either by accepting or rejecting the item), records associated therewith are migrated from the promotions database into an archive database.

Optionally, a notification message can be occasionally sent to the end user via the electronic network 100 to the end user of his/her credit status.

Once a batch has attained the required number of responses, the end date for testing is set to the current date, and a batch complete flag is set to a logical true. It is noted that the number of responses can be allowed to slightly exceed the required number of responses in this case. During nightly processing, the batch response data is summarized and packaged into a report. The report provides demographic data on the respondents and provides a measure to compare results across albums within a genre for a specific client. The client can be a record label that submitted the test request or a radio station seeking well-rated music.

The report can include: the BatchID; a report date and time; the scheduled start and end times; the actual start and end times; the MusicID for the album, the title of the album;

the first and last name of the primary artist for the album; the SongID, title, artist, and publisher of each tested song from the album; a count of the number of testing responses for the album; a hit index providing a count of responses which rate each song as least/highest; an average music testing score for each song and for the batch; a bar graph showing a percentage of responses at each score; and listener demographics. The report can also indicate a number of promotions that were accepted and a number that were declined, a promotion completion time, and a comparison of respondent ratings of redeemed albums versus non-redeemed albums.

Either the report or a notification thereof can be delivered to the client via the electronic network 100. For example, the music testing component 152 can initiate that an electronic mail message be sent to the client after one hundred persons have rated songs from an album. The client, in turn, navigates to a Web site having the report in a marking language format such as HTML. The client can review the report using a browser program. The music testing component 152 generates a bill for providing the testing service for the client.

As an alternative to generating a report after receiving a predetermined number of ratings, the report can be generated after a predetermined time duration. Once the predetermined time duration has elapsed, the music testing component 143 generates a report summarizing as much information that was gathered. If a client wants to receive ratings within a shortened time period, the queue can be adjusted to make the album more likely to be presented to an end user than other albums in its genre or category. If desired, the queue can be adjusted to present the album to all end users which select its genre or category.

It is noted that as an alternative to testing a batch of songs from a single album, a batch can comprise songs from a plurality of albums. In this case, it is preferred that the songs in a batch have some relationship with one another. It is also preferred that each song being tested be included in only one batch.

Preferably, the music genre or category is associated with an entire album. For compilations and other multiple-format albums, a multi-genre category can be provided.

The music testing component 152 frequently checks tables in the database to ensure that null pointers do not exist. For example, a tested album may still reside in the database after its associated audio files have been removed and/or archived.

FIG. 57 is a block diagram summarizing a site map for an embodiment of the listening booth or rating room feature. The site map identifies functions available to the end user at specific points throughout the graphical interface. Upon entering the rating room feature, a main interface page is provided (block 1500) wherein a step of checking for installed components is performed. The main interface page provides a feature to check the status of the end user (block 1502), a feature to choose an album to rate by genre (block 1504), an optional feature to reshuffle album choices (block 1506), and a feature to display an overview and help information (block 1510).

From the feature to check the status of the end user (block 1502), the end user can choose to fulfill an option to receive a complimentary music item in return for rating a number of items in a time duration (block 1512). A confirmation message for this option is provided in block 1514.

Further from the feature to check the status of the end user (block 1502), the end user can review previously-rated albums (block 1516). In this path, a feature to view album

information is provided (block 1520). From this feature, features to view song titles (block 1522), to view liner notes (block 1524), to review rated songs (block 1526), and to buy a CD (block 1530) are provided.

The feature to choose an album to rate by genre (block 1504) provides a feature to view album information (block 1532), a feature to choose a song title to rate (block 1534), and a feature to buy a CD (block 1536). The feature to choose the song title to rate (block 1534) provides a feature to rate a song (block 1540), a feature to view liner notes (block 1542), and a feature to buy a CD (block 1544). The feature to rate the song (block 1540) provides a feature to submit a ratings for the album (block 1546).

FIG. 58 is a block diagram of an embodiment of a content entry subsystem 1600. The content entry subsystem 1600 is described with reference to elements of FIG. 1.

The content entry subsystem 1600 is used to acquire, convert, and/or update content stored by the storage device 116. In general, content is acquired, converted, or updated by either: (i) importing the content from an external source such as the server 144; or (ii) entering the content using an administrative interface 1602. The content entry subsystem 1600 addresses these two approaches of maintaining and populating the storage device 116 with content.

The content entry subsystem 1600 includes a content converter 1604 to convert the content from a first format associated with the server 144 to a second format associated with the server 102. The content converter 604 can include one or more rules, and/or one or more filters to convert data from the server 144 to data which conforms to system requirements for the server 102. Similarly, the administrative interface 1602 performs a step of verifying that manually-entered data conforms to the system requirements.

Preferably, the content entry subsystem 1600 periodically imports content data from the server 144. For example, the content entry subsystem 1600 can be programmed to import content data from the server 144 on a nightly basis. The content data can have the form of a table retrieved from a Web page provided by the server 144. The Web page is updated periodically (e.g. nightly) for this purpose. The content entry subsystem 1600 retrieves a content data file through HTTP, and stores a copy of the file with delimited field separators. If the Web page is password protected, the content entry subsystem can automatically provide a password to gain access thereto.

Once retrieved, the content data is converted or otherwise scrubbed to the second format. The content data in the second format is stored by a staging database 1606. Preferably, the staging database 1606 substantially replicates the information stored in the server 144.

The content entry subsystem 1600 assists in updating the database 148 using the converted data in the staging database 1606. In general, the content entry subsystem 1600 updates the database 148 based upon the most recent changes in the staging database 1606. The content entry subsystem 1600 compares the converted data to existing, active data in the database 148. Rules are generated to convert the newest data to the active data. Caution is exercised to prevent changes that involve row deletes and key updates. The rules and exceptions can be dynamically generated to interpret changes in the server 144.

The difference between the converted data and the active data is formatted to become an entry (update/add/delete) for the staging database 1606. The data is made active upon satisfying an integrity check.

Daily changes to the database 1606 are logged. The changes can be summarized in a nightly administrative

report generated by the content entry subsystem 1600. A daily report of the data import process can be communicated by electronic mail or other means to system administrators. The logs of updates can be formed using transaction logs from a database software package such as SQL.

After one or more databases, including the database 148, are updated by the staging database 1606, the data in the staging database 1606 is backed-up by a data backup and recovery system 1610, and purged. The data backup and recovery process 1610 makes available the most recent copy of the staging database 1606.

Manually-entered data received by the administrative interface 1602 can include media location and other information used throughout the system. The media location can be in the form of an electronic address, such as a URL or a Uniform Resource Name (URN), for accessing the content via the electronic network 100. Some information attributes may be considered optional. The content entry subsystem 1600 accepts a new entry without requiring the optional information attributes. The content entry subsystem 1600 verifies the information attributes. An encoded music file associated with the media location is made available upon verification.

Two examples of data formats from the server 144 include a broadcast format and a content format. TABLE I shows radio station data extracted from the broadcast format to generate data in the second format. TABLE II shows music data extracted from the broadcast format to generate data in the second format. TABLES III to VII show song data extracted from the Liquid Audio format to generate data in the second format.

The station ID parameter is a code to uniquely identify each radio station. Preferably, the station ID is not relied upon for identifying the station. The Call Letters parameter provides the call letters identifying the radio station. The Frequency parameter provides the over-the-air broadcast frequency of the radio station. The Format parameter identifies the format or category of content broadcast by the radio station. The City, State, and Country parameters identify the city, state, and country of origin, respectively, of the radio station. The Description parameter provides a description, a monicker, or another identifier of the radio station.

The Station Logo Address parameter includes an electronic address of a logo or another image associated with the radio station. Preferably, the logo is stored locally at the server 102 to improve player performance. The Station WWW Address parameter provides an electronic address such as a URL identifying a Web site for the radio station. The Schedule Address parameter provides an electronic address for a site having a programming schedule for the radio station.

The Audio Stream Pointer Address (LQ) provides an electronic address of a lower-quality audio stream of content broadcast by the radio station. The Audio Stream Address (LQ) provides a file name and electronic address to verify the correct lower-quality audio stream for the station. The Audio Stream Bit Rate (LQ) parameter indicates the bit rate of the lower-quality audio stream.

The Audio Stream Pointer Address (HQ) provides an electronic address of a higher-quality audio stream of content broadcast by the radio station. The Audio Stream Address (HQ) provides a file name and electronic address to verify the correct higher-quality audio stream for the station. The Audio Stream Bit Rate (HQ) parameter indicates the bit rate of the higher-quality audio stream.

The Blackout Period parameter indicates times and/or dates for which content from the radio station is blacked-out or otherwise inhibited from being received via the electronic network 100.

The Album ID parameter includes a code to uniquely identify a music item such as an album. Preferably, the AudioNet Album ID is not relied upon to identify the album. The Album Title parameter includes a title of an album or another music item. The Format parameter identifies the format of the music item. The Artist Sort Name parameter provides a name, used for sorting purposes, of an artist associated with the music item. The Artist Name parameter provides a name of the artist to be used for descriptive purposes.

The Album Art Address parameter provides an electronic address of a cover art image associated with the music item. Preferably, the cover art image is stored locally by the server 102 to improve player performance. The Artist WWW Address parameter provides an electronic address, such as a URL, of a Web site for the artist. The Album Description parameter provides descriptive information for the music item. The Audio Stream Meta File Address parameter provides an electronic address, such as a MetaURL, for providing an audio stream of the music item. The Audio Stream Address parameter provides a file name (such as a .ra or .asf file name) and an electronic address identifying the audio stream of the music item. The Audio Bit Rate parameter indicates the bit rate or encoding bandwidth of the audio stream.

The Label Name parameter identifies a publishing entity for the music item, such as a record company or label. The Label Address parameter includes an electronic address, such as a URL, for a Web site of the record company or label.

TABLES III to VII show song data extracted from the content format to generate data in the second format. The data includes song information, artist information, recording information, rights information, watermark information, and miscellaneous information.

TABLE III

Parameter
Artist(s)
Song Title
Album Title
Composer (Music)
Composer (Lyrics)
Arranger
Publisher
Genre
Language

TABLE III illustrates song information parameters extracted from data having the content format. An Artist parameter identifies the artist or artists who performed the song. Separate parameters may be defined for the "headline" artist, as well as session artists, orchestras, conductors, choruses, etc. A Song Title parameter provides a title of a song or like music item. An Album Title parameter provides a title of an album containing the song. A Composer parameter identifies at least one composer of the song. An additional parameter may identify the writer of the songs lyrics. An Arranger parameter identifies at least one arranger of the song. The Publisher parameter identifies the publisher of the song. A Genre parameter indicates the genre or category of the song. The Language parameter indicates a language of the lyrics of the song. An ISRC ID parameter includes a 12-digit alphanumeric serial code comprised of a two-letter country code, a three-character author code, a two-digit year code, and a five-digit song identifier.

TABLE V illustrates recording information parameters extracted from data having the content format. A Format

parameter indicates an audio or a video format of the song. A Recording Type parameter indicates a recording type of the song. A Publication Date parameter indicates a publication date for the song. A Country of Origin parameter identifies a country of origin for the song. A Playing Time

parameter indicates a playing time of the song. A Recording Studio parameter identifies one or more recording studios used to record the song. A Mix Down Studio parameter identifies one or more studios used to mix down the song. A Mastering Studio parameter identifies one

or more studios used to master the song. A Producer parameter identifies one or more producers of the song. An Engineer parameter identifies one or more recording engineers for the song. A Mastering Engineer parameter identifies one or more mastering engineers for the song. A Remixer parameter identifies any remixers of the song. An ISRC ID parameter includes a 12-digit alphanumeric serial code comprised of a two-letter country code, a three-character author code, a two-digit year code, and a five-digit song identifier.

TABLE V

PARAMETER
Format
Recording Type
Publication Date
Country of Origin
Playing Time
Recording Studio(s)
Mix Down Studio(s)
Mastering Studio(s)
Producer(s)
Engineer(s)
Mastering Engineer(s)
Remixer(s)
ISRC Code

TABLE VI illustrates rights information parameters extracted from data having the content format. A UPC Code parameter includes a 20-digit UPC code identifying the album. Preferably, the UPC is the convention to identify all music titles in a music library from radio station broadcast synchronization signals. A cross-referencing database can be used to translate between a cart code from a radio station to a UPC.

TABLE VI

PARAMETER
UPC Code
Copyright
Sound Recording Copyright
Performance Rights Agency
Mechanical Rights Agency
Record Label
Distributors
Date Encoded
Encoded By

A Copyright parameter provides copyright information for the song. A Sound Recording Copyright parameter provides sound recording copyright information for the song. A Performance Rights Agency identifies a performance rights agency for the song. A Mechanical Rights Agency identifies a mechanical rights agency for the song. A Record Label parameter identifies the record label for the song. A Distributors parameter identifies one or more distributors of the song.

A Date Encoded parameter indicates a date at which the song was encoded. An Encoded By parameter identifies a party that encoded the song.

TABLE VII illustrates watermark information parameters and miscellaneous parameters extracted from data having the content format. A Standard Watermark parameter provides a standard digital watermark for identifying a source of the song. A User-Defined Watermark parameter provides a user-defined digital watermark for the song. A Notes parameter includes notes associated with the song.

TABLE VII

PARAMETER
Standard Watermark
User-defined Watermark
Notes

Referring back to FIG. 1, the audience measuring component 154 monitors and reports listenership information for items played using the player 142. Preferably, listening activity data is recorded for each instance of an end user playing an audio content item for a duration that attains or exceeds a predetermined listening time threshold. If the duration is less than the predetermined listening time threshold, the listening behavior is not considered significant, and the listening activity data is not recorded. Preferably, the predetermined listening time threshold is a global system parameter used for all audio content items.

Any of the herein-described audio content items, including but not limited to radio category items, events category items, library category items, and music category items, can be monitored in this way. The data can include an indication of the audio content item, an indication of which end user is playing back the item, a demographic of the end user, a time at which the audio content item is played, and a location of the end user.

Based upon any of the listenership information, the audience measurement component generates and provides reports including actual data and/or summaries thereof. These reports can include measurements that are familiar to advertisers, such as Average Quarter Hour, Cumc, and time spent listening, which are familiar to radio advertisers. Each of these measurements can be derived from data tracked by the system. Each report can be specific to one or more radio stations associated with an entity such as a broadcasting company, or to one or more songs associated with an entity such as a record company, for example. The report is communicated to the entity to provide audience listenership information. The report can be communicated via the electronic network 100. The report can be stratified by demographics such as gender, age, occupation, and geographical region of the end users. Each report can be automatically generated either at periodic or predetermined times or upon receiving a request therefor.

A particular embodiment of the audience measuring component 154 is as follows. When an end user initially enters the site providing the player 142, an entry is made to a listener log database. The listener log database to which the entry is made depends upon which type of audio content item the end user is receiving. Preferably, the listener log database is selected from a radio log database, a music log database, an events log database, and a library log database. The entry includes an identifier of the end user (e.g. the CustomerID of the end user) and an identifier of the content (e.g. a radio station identifier, an event identifier, an album identifier, and/or a song identifier).

As the end user continues to listen to the content item for a predetermined time threshold, a subsequent entry is made into the appropriate listener log database. This process is repeated so that a new entry is made after every period having the predetermined time threshold. If the content item has changed, the end time is recorded, and the new entry identifies the new content item. The new content is monitored in the same way as the previous content item. In this way, when the end user leaves the site, only the final seconds of listening (up to a maximum of the predetermined time threshold) are not tracked. Preferably, a clock (not illustrated) associated with the server 102 is used to reference all time-based data for the audience measuring component 154.

The audience measuring component 154 periodically generates reports based upon the listener log databases. Each report can be generated daily, weekly, monthly, quarterly, or annually and communicated to a client (e.g. a radio station) via either paper or the electronic network 100 using electronic mail, the World Wide Web, or HTML. Each report can be dynamically created rather than stored. Preferably, the report indicates time of day listening habits and numbers of listeners. Demographic data of listeners can also be provided.

The report can include any combination of: (i) a measurement interval or period (e.g. daily, monthly, quarterly, or yearly); (ii) a measurement interval date range; (iii) call letters and band of the radio station; (iv) a count of unique listeners; (v) a count of all listeners; (vi) an average listening time per connection; (vii) an average listening time per unique listener; (viii) a graph interval (e.g. in minutes); (ix) an average simultaneous users; (x) an average quarterly hour listener metric; and (xi) a cumulative listener metric (cumc).

The listener log databases can be maintained by archiving the data, and purging the databases on a daily basis. Preferably, the archived data includes a record of the start time and end time for each end user based upon a plurality of entries in the listener log databases.

Still with reference to FIG. 1, a detailed description of the advertising component 160 is provided. The advertising component 160 maintains a database of advertising records. Each advertising record can include an advertisement type, an electronic address, such as a URL, for an audible or visible advertisement, client information identifying the advertiser, and information designating a target audience (e.g. based on customer display information, music, and radio station genre). Preferably, there are four types of advertisements: a banner advertisement, an attraction advertisement, a feature advertisement, and an audio advertisement.

A plurality of banner advertisements from the database are queued for display with the player 142. The banner advertisements are successively displayed based on an automated process performed by the advertising component 160. For example, a subsequent banner advertisement in the queue can be displayed every 150 seconds in the banner advertising region 1304 described with reference to FIG. 47.

A plurality of attractions advertisements from the database are queued for display with the player 142. The attractions advertisements are successively displayed based on an automated process performed by the advertising component 160. For example, the attractions advertisements can be displayed in the attractions region 1306 or the region 1312 described with reference to FIG. 47. Preferably, attractions advertisements are contextually associated with audio content played using the player 142. For example, an attractions advertisement can promote an upcoming concert or an album signing related to audio content being played using the player 142. In this way, the advertising component 160 can provide content-specific advertisements.

A plurality of feature advertisements from the database are selected based upon broadcast signals. The feature advertisements can include static information such as a radio station logo presented continuously while the player 142 is playing content from an associated radio station. The feature advertisements can include dynamic information such as an image of each album being played. Further, the feature advertisements can include a visible advertisement tailored to appear during a broadcast commercial. The feature advertisements can be displayed in the information space 1314 described with reference to FIG. 47, for example.

The audio advertisements replace advertisements within the broadcast prior to communication to the client apparatus 106. In this way, alternative Internet-based broadcasts and regional-based broadcasts can be generated.

The advertising component 160 can determine an associated subset of the advertisements targeted to each end user. Further, the advertising component 160 can determine the sequence in which the subset of advertisements are to be presented. Advertisements can be selected for an end user based on any of the following: online and off-line purchasing, demographics, psychographics, geographies, sonographics (e.g. listening preferences), and listener behavior. In this way, the advertising component 160 can provide user-specific advertisements.

The advertising component 160 tracks viewership and listenership of each of the advertisements in the database. Data is recorded indicative of which end users have seen or heard an advertisement in an active window for at least a predetermined time duration, and times at which the advertisement was seen or heard. The data can further track which end users click through or otherwise select each advertisement to get additional information, and track the contemporaneous activity of the end users.

The advertising component 160 generates reports based upon the tracking data. The reports correlate end user demographics with metrics of the viewing and listening data. Client advertising billing reports can also be generated based upon the tracking data.

It is noted that some of the advertising images and audio files can be cached to the storage device 132 of the client apparatus 106 to improve system performance. Audio files can be pre-queued and pre-buffered for streaming at the client apparatus 106. Either in-band signaling or out-of-band signaling can be used to trigger the images and audio files. An example of in-band signaling includes a tone encoded within an audio data stream to identify and trigger content insertion. An example of out-of-band signaling includes data streamed with the audio data stream.

It is also noted that to improve system performance, the server 102 can provide the client apparatus 106 with content, in addition to the active content, based on a nearest subset of content selections on the graphical radio dial, presets, or favorites based on the end user's listening behavior. The additional content can be pre-buffered by the client apparatus 106.

Referring to FIG. 59 in conjunction with FIG. 1, the herein-described components of the server 102 can interact with the player 133 (and optionally player 142) to provide personalized content to each of a plurality of end users of client apparatuses 104 and 106. Personalized content can be provided to a first user by: (i) communicating from the server 144 first audio content 1700 associated with a broadcast to a first user location 106, together with control data with information relating to the content, the broadcaster, the user or other attributes such as location of the user, examples of which are set out below; (ii) selecting (at the server 102) second content 1710 based upon a first user profile (preferably located at the server 102); and (iii) communicating a first signal to the first user location.



The first signal to the first user location comes from a server such as server 102 or 144, and the player (player 142 and player 133 in combination) causes switching of content from a first server 102 to a second server 144 or from the server 144 to another server (not shown), from which the inserted advertisement or other material is derived.

The switching of content can take place at the player 133 or at the player 142. In the former case, upon detection of the relevant code, the player 133 can cause the additional content to be inserted from either a local storage device 132 or from the additional content server (not shown in FIG. 1).

Upon registration of the client with the server 102 the server will preload a queue of advertisements or other content items into the storage device or will preload addresses or URLs for those content items into the storage device 132. Thereafter, as the client 106 receives content from the server 144 and as it identifies an insertion point 1720 from the associated data, instead of presenting any content that it receives from server 144 at that insertion point, the client will present one of the preloaded advertisements or other content items from its storage device 132.

These advertisements can be of appropriate length in the case of audio advertisements such that an insertion point 1720 that indicates an opportunity for (for example) a twenty or thirty second sound advertisement can cause such an advertisement to be retrieved from the storage device 132. Alternatively, these insertion points 1720 can indicate addresses or URLs which cause the client 106 to turn to another server (not shown) to find a content item to be inserted at that point, and that other server will decide what that content should be.

Another example of an insertion item could be a complete song from a local artist, and the insertion point 1720 indicates that this should be the item inserted, whereupon the client refers to the local server and the server delivers whatever is the selected local song for the selected local artist.

Instead of using insertion points 1720 identifiable in the data stream from the primary content server 144, the server 102 can provide the client 106 with a schedule of insertion times and the client 106 can maintain a real time clock and at the designated insertion times it will turn to its next insertion item for insertion into the content being received from server 144. It is preferred, in the case of streaming audio, that data is interleaved into the audio indicating such information as to the artist or song currently being played. This interleaved data can be used by the client 106 as the trigger for causing a replacement of the data being received from server 144. For example an entire song could be replaced. Alternatively, that data could have a separate logical connection rather than being interleaved into the audio.

Of particular interest are cases in which the first audio content 1700 and the first signal are communicated via an electronic network including at least one of the Internet, an intranet, and an extranet. The first signal synchronizes playback of the second content with respect to playback of the first audio content 1700.

The second content 1710 can include a first at least one image selected in dependence upon the first user profile 150. In this case, the first signal is to synchronize display of the first at least one image to playback of the first audio content 1700. The first at least one image can be selected further in dependence upon content within the first audio content 1700. Of particular interest are cases in which the first image is a content-specific image and/or a broadcaster-specific image.

Personalized visual content can be provided to a second user 104 by communicating the first audio content 1700

associated with the broadcast (from server 144) to a second user location 104, selecting a second at least one image based upon second user profile stored in customer profile 150, and communicating a second signal to the second user location (e.g. from server 102 or from another server not shown). The second signal synchronizes display of the second at least one image to playback of the first audio content 1700. The second at least one image can differ from the first at least one image.

The second content 1710 can include second audio content selected in dependence upon the first user profile. In this case, the first signal is to synchronize playback of the second audio content with respect to playback of the first audio content 1700. The second audio content can be synchronized for insertion within the first audio content 1700. Of particular interest are cases in which the second content 1710 includes at least one of advertising content and programming content.

Personalized audible content can be provided to the second user by communicating the first audio content 1700 associated with the broadcast to the second user location, selecting third audio content based upon the second user profile, and communicating a second signal to the second user location to synchronize playback of the third audio content with respect to playback of the first audio content 1700. To personalize the content, the third audio content can differ from the second audio content. The third audio content can be synchronized for insertion within the first audio content 1700.

Each user profile is updated by monitoring information associated with user-specific, apparatus-independent use of a plurality of audio content player apparatus via the electronic network. For example, the user profile for a user can be based upon his/her use at both the client apparatus 106 and the client apparatus 104. Each user profile can include transaction information, demographic information, psychographic information, geographic information, sonographic information, and listening behavior information for its associated user.

Thus, there has been described herein several embodiments including preferred embodiments of audio content player methods, systems, and articles of manufacture.

Embodiments of the present invention can provide an Internet-based digital audio service that combines an easy-to-use, customizable audio player interface with a wide variety of audio content. Users are able to access audio-on-demand through an archive of music and spoken word titles, and are able to tune to live radio broadcasts from around the world. Further, content information is integrated with content distribution. In this way, an end user can obtain information about content to which he/she is listening. Additionally, the end user is provided a means for purchasing the content, such as music content, to which he/she is listening.

User preferences and behavior are tracked to generate information of interest for each user. This information can relate to his/her music taste, geographical location, and/or other personalized criteria. The information can also be used by radio stations and record labels to determine which music is worth playing.

Embodiments of the player advantageously support browsing of audio content on the Internet using two metaphors: (i) a radio station metaphor and (ii) a record store listening booth metaphor.

Additional features include: concurrent display of visual information based on material broadcast by a radio station; paging of the end user for scheduled events; an interactive schedule for radio programming; listing available stations for a day; and a map to show a location of origin of a radio station.

It is noted that as an alternative or in addition to providing audio content, the herein-described methods and systems can be used to provide video content.

It will be apparent to those skilled in the art that the disclosed embodiments may be modified in numerous ways and may assume many forms other than the preferred form specifically set out and described above.

Accordingly, it is intended that the appended claims cover all such modifications which fall within the true spirit and scope of the invention.

What is claimed is:

1. A method of operation for a server that interacts with a plurality of client apparatuses to provide personalized content to each client apparatus, the method comprising the steps of:

communicating a first media content and control data associated with the first media content from the server to a particular client apparatus of the plurality of client apparatuses, wherein the control data indicates at least one insertion point of the first media content;

retrieving a user profile associated with the particular client apparatus;

selecting a second media content based on the user profile; and

communicating the second media content and a control signal associated with the second media content from the server to the particular client apparatus, wherein the control signal instructs the particular client apparatus to insert the second media content at the at least one insertion point of the first media content.

2. The method of claim 1, wherein the broadcast is communicated via wireless communication to at least one wireless receiver and via wireline communication to the particular client apparatus.

3. The method of claim 2, wherein the at least one wireless receiver and the particular client apparatus receive the first media content, but only the particular client apparatus may receive the second media content.

4. The method of claim 1, further comprising the step of retrieving the user profile from a second server separate from the server.

5. The method of claim 1, further comprising the step of retrieving the second media content from a second server separate from the server.

6. The method of claim 1, further comprising the step of storing at least one of the second media content and an address of the second media content in a queue of the particular client apparatus.

7. The method of claim 6, further comprising the steps of: detecting the at least one insertion point based on the control signal; and

in response to detecting the at least one insertion point, presenting the second media content at the at the particular client apparatus instead of any content of the first media content at the at least one insertion point.

8. The method of claim 1, wherein the first media content includes at least one of an audio content, an image content, and a video content.

9. The method of claim 1, wherein the first media content, the control data, and the control signal are communicated to the particular client apparatus via an electronic network including at least one of an Internet, an intranet, and an extranet.

10. The method of claim 1, wherein the control signal synchronizes playback of the second media content with playback of the first media content.

11. The method of claim 1, wherein the second media content includes at least one image selected based on the user profile.

12. The method of claim 1, wherein the second media content includes at least one image selected based on the first media content.

13. The method of claim 12, wherein the at least one image is one of either a content-specific image and a broadcaster-specific image.

14. The method of claim 1, wherein the second media content includes at least one of an advertising content and a programming content.

15. The method of claim 1, further comprising the step of generating the user profile before the step of accessing the broadcast intended for communication to the plurality of client apparatuses.

16. The method of claim 1, wherein the user profile is updated by monitoring operational activity of the particular client apparatus.

17. The method of claim 1, wherein the user profile is updated by monitoring operational activity of a particular group of client apparatuses.

18. The method of claim 1, wherein the user profile includes at least two of: transaction information, demographic information, psychographic information, geographic information, sonographic information, and listening behavior information.

19. The method of claim 1, wherein:

the step of communicating the first media content and the control data to a particular client apparatus includes the step of communicating the first media content and the control data to a second client apparatus;

the step of retrieving a user profile associated with the particular client apparatus includes the step of retrieving a second user profile associated with the second client apparatus;

the step of selecting a second media content based on the user profile includes the step of selecting a third media content based on the second user profile, wherein the third media content is different from the second media content; and

the step of communicating the second media content and a control signal associated with the second media content to the particular client apparatus includes the step of communicating the third media content and a second control signal associated with the third media content to the second client apparatus, wherein the second control signal instructs the second client apparatus to insert the third media content at the at least one insertion point of the first media content.

20. A method of operation for a server that interacts with a plurality of client apparatuses to provide personalized content to each client apparatus, the method comprising the steps of:

communicating a first media content and control data associated with the first media content from the server to a particular client apparatus of the plurality of client apparatuses, wherein the control data indicates a schedule of insertion times;

retrieving a user profile associated with the particular client apparatus;

selecting a second media content based on the user profile; and

communicating the second media content from the server to the particular client apparatus, wherein the particular client apparatus maintains a time clock to determine when to insert the second media content into the first media content based on the control data.