A method and apparatus is described in which media data such as audio and video data is transmitted to appropriate reproduction means in dependence on the location of the user. For example, in the case of audio data such as music, several reproduction means comprising appropriate amplifiers, speakers, and the like can be positioned around a home, for example in different rooms. The user is equipped with a device which he keeps on his person, which can either be detected by the various reproduction units, or, in other embodiments itself detects the reproduction units, or detects its own location. The reproduction units are then controlled so as to operate appropriately in dependence on the location of the user, for example, when the user is in the same room as the reproduction unit. In some embodiments the location calculation can be relative between the reproduction units and the mobile unit carried by the user, or in other embodiments the location calculation can be absolute i.e. with reference to an external fixed location reference system. In any embodiments, however, the problem of media content being supplied to reproduction means which are located inappropriately is overcome.
Figure 23

S.23.2
RECEIVE POSITION FIX FROM MOBILE UNIT

S.23.4
MAP POSITION TO SINK LOCATIONS

S.23.6
DETERMINE CLOSEST SINK TO MOBILE UNIT

S.23.8
ALREADY STREAMING MEDIA TO EXISTING SINK?

S.23.10
STOP STREAMING MEDIA TO EXISTING SINK

S.23.12
STREAM MEDIA TO DETERMINED CLOSEST SINK

Figure 22

S.22.2
PERFORM POSITION FIX USING SPS

S.22.4
COMMUNICATE POSITION FIX TO MEDIA CONTROLLER USING WIRELESS Tx
Method and System for Providing Media Content to a Reproduction Apparatus

Technical Field

The present invention relates to a method and system for providing data, and in particular media data such as audio or visual data to a reproducing apparatus for reproduction. More particularly, the present invention relates to a method and apparatus for providing media data in a location dependent manner.

Background to the Invention and Prior Art

It is already well known in the art to provide media data reproduction means, such as audio receivers equipped with speakers, video displays such as televisions, or the like to be provided in several rooms of a home. Media data, such as audio or video data can be transmitted to the appropriate reproduction means by virtue of a wired, or, more recently, a wireless network. For example, the rise in popularity of wireless networks which operate in accordance with the IEEE 802.11x family of standards has meant that it has become readily possible for a home user to set up a wireless network in his own home, having a central media server, which can then serve media data in a streaming manner to peripheral reproduction devices, using the wireless network. Alternatively, instead of using a wireless network, it is also known to use a wired network.

Furthermore, in simpler embodiments, instead of establishing a local area network, whether it be wired or wireless, instead, and particularly for music, a user can simply locate speakers within different rooms, wired to a central switching box, which switches the output of an amplifier to the appropriate set of speakers for the room which is presently occupied. The user will typically manually operate the switch. In this way, music, for example, can be supplied to any room in a home as appropriate.

However, with the various arrangements of the prior art, once a system has been set up to stream media data to a particular reproduction device, such as audio to a set of speakers, then the system tends to remain fixed in this configuration until it is manually altered, for example, to switch the output to a different set of speakers in a different room. However, during day to day activities, and particularly activities such as
cleaning, cooking, and various other household activities, users often move between different rooms. In such a case, however, they can move from a room where music is being played to a room where music is not being played. To compensate for this, the music can be played in the room to which it is being streamed at a higher volume, such that it is heard in the second room, but this itself can bring about further problems, in terms of damage to hearing, and noise pollution for third parties.

The situation can be the same for video data, in that when a video signal is being supplied to a display in a first room, if the person leaves the first room then the signal will still be being reproduced by the display in that room, unless manual alteration of the system configuration is undertaken. Moreover, with a video output then the solution of “turning up the volume” does not work if a user is in a different room, as he will still not be able to see the screen.

Summary of the Invention

The present invention addresses the above problems by providing a method and apparatus in which media data such as audio and video data is transmitted to appropriate reproduction means in dependence on the location of the user. For example, in the case of audio data such as music, several reproduction means comprising appropriate amplifiers, speakers, and the like can be positioned around a home, for example in different rooms. The user is equipped with a device which he keeps on his person, which can either be detected by the various reproduction units, or, in other embodiments itself detects the reproduction units, or detects its own location. The reproduction units are then controlled so as to operate appropriately in dependence on the location of the user, for example when the user is in the same room as the reproduction unit. In some embodiments the location calculation can be relative between the reproduction units and the mobile unit carried by the user, or in other embodiments the location calculation can be absolute i.e. with reference to an external fixed location reference system. In any embodiments, however, the problem noted above of media content being supplied to reproduction means which are located inappropriately is overcome.

In view of the above, from a first aspect the present invention provides a system for reproducing media content, comprising: i) a mobile unit for carrying, in use, on a user’s
person; ii) one or more media sinks each comprising at least one media content reproducing apparatus for reproducing media content data provided thereto; iii) at least one media content source from which media content is provided; and iv) at least one controller, the controller being configured to determine the location of the mobile unit with respect to the location(s) of the one or more media sinks, and to select a media sink for reproducing media content in dependence on the respective locations; wherein the media source is controlled to provide media content data to the selected media sink for reproduction thereby.

From another aspect is provided a method of reproducing media content, comprising the steps: a) determining the location of a mobile unit which is carried, in use, on a user’s person with respect to the location(s) of one or more media sinks each comprising at least one media content reproducing apparatus for reproducing media content data provided thereto; b) selecting a media sink for reproducing media content in dependence on the respective locations of the mobile unit and the media sink(s); c) controlling a media source which outputs media content data to provide media content data to the selected media sink for reproduction thereby; and d) reproducing the media content data at the media sink.

Further aspects, as well as further features and advantages of the present invention which can be found in preferred embodiments thereof will be apparent from the appended claims.

**Brief Description of the Drawings**

Further features and advantages of the present invention will become apparent from the following description of embodiments thereof, presented by way of example only, and wherein like reference numerals refer to like parts, and wherein: -

Figure 1 is a block diagram of the elements involved in a first embodiment of the present invention;

Figure 2 is a block diagram of the elements involved in the first embodiment of the present invention;
Figure 3 is a flow diagram illustrating the steps performed by a mobile unit in the first embodiment of the present invention;

Figure 4 is a flow diagram illustrating the steps performed by a media sink in the first embodiment of the present invention;

Figure 5 is a flow diagram illustrating the steps performed in a second embodiment of the present invention;

Figure 6 is a flow diagram illustrating the steps performed in the second embodiment of the present invention;

Figure 7 is a block diagram illustrating the elements involved in a third embodiment of the present invention;

Figure 8 is a block diagram illustrating the elements involved in the third embodiment of the present invention;

Figure 9 is a flow diagram illustrating the steps performed by a mobile unit in the third embodiment of the present invention;

Figure 10 is a flow diagram illustrating the steps performed by a media sink in the third embodiment of the present invention;

Figure 11 is a flow diagram illustrating the steps performed by a media server in the third embodiment of the present invention;

Figure 12 is a block diagram illustrating the elements of a fourth embodiment of the present invention;

Figure 13 is a block diagram illustrating the elements involved in the fourth embodiment of the present invention;
Figure 14 is a flow diagram illustrating the steps performed by a media sink in the fourth embodiment of the present invention;

Figure 15 is a flow diagram illustrating the steps performed by a media server in the fourth embodiment of the present invention;

Figure 16 is a block diagram illustrating the elements involved in a fifth embodiment of the present invention;

Figure 17 is a block diagram illustrating the elements involved in the fifth embodiment of the present invention;

Figure 18 is a flow diagram illustrating the steps performed by a mobile unit in the fifth embodiment of the present invention;

Figure 19 is a flow diagram illustrating the steps performed by a media sink in the fifth embodiment of the present invention;

Figure 20 is a block diagram illustrating the elements involved in a sixth embodiment of the present invention;

Figure 21 is a block diagram illustrating the elements involved in the sixth embodiment of the present invention;

Figure 22 is a flow diagram illustrating the steps performed by a wireless unit in the sixth embodiment of the present invention; and

Figure 23 is a flow diagram illustrating the steps performed by a media server in the sixth embodiment of the present invention.

Overview of the Embodiments of the Invention
Before proceeding to describe specific third embodiments of the invention, a brief overview of the operation of those embodiments will be given, to aid understanding thereof.

Embodiments of the invention are based upon the principle that a reproduction unit or means, such as, for example for music a speaker or set of speakers with, optionally, associated drive circuitry such as an amplifier or the like, or, for example for video, a display such as an LCD TV, CRT TV, plasma screen, or the like is provided, which is capable of reproducing the media content provided to it. In the following embodiments, we refer to this reproduction unit as a “media sink”, insofar as it accepts media content such as audio and/or video data, and reproduces the content encoded within that data. Moreover, by “data”, we do not exclude analogue signals, which are intended to be incorporated by the term.

In addition to the media sinks, a mobile unit is also provided by embodiments, which is intended to be kept upon the person, and carried around by the user wherever he or she goes within the home. The mobile unit is important in allowing the location of the user to be determined.

The third main element of the embodiments of the invention is a media content source, from which media contents such as audio or video data can be supplied. The media source may, for example, be a store, such as a hard disk drive or the like on which media data is stored for later reproduction. Alternatively, the media source may be a source which continuously and dynamically generates or receives data, for example a television or radio receiver, or a player such as a DVD player, video player, AV player, or the like.

With these three elements, the operation of any embodiment can be summarised thus. The mobile unit is carried by the user, and is used to help determine the location of the user, and hence subsequently which media sink should be reproducing the media content. In dependence on the location of the user an appropriate media sink is activated, being preferably the sink in the room in which the user is presently located. On activation, the media source begins providing to the media sink media content, for
example in the form of audio or video data. The media sink then reproduces the media contents data as appropriate, dependent on its type.

Within embodiments of the invention the mobile unit can be used to determine the location of the user, and then the appropriate media sink is selected to which media contents data is provided by a media source. With this arrangement media contents data such as audio and video data can be provided to an appropriate media sink which is proximal to the user's present location.

In some embodiments the media source may be provided in the mobile unit itself, and the mobile unit communicates to a proximal media sink, for example transmitting the media contents data to the proximal media sink via a short range wireless connection, such as a Bluetooth connection or the like. In other embodiments the media source may be located in a central media server, which then provides media contents data to the appropriate media sink via a wired or wireless network or other connection.

Moreover, in some embodiments the location determination can be relative between the mobile unit and the media sinks. That is, only the relative position of the mobile unit with respect to the media sinks is known i.e. it can be determined that the mobile unit is near a particular media sink, and hence that media sink should be active. In preferred embodiments this relative determination can be performed using received signal strengths from a short range wireless system, such as Bluetooth, or the like.

In other embodiments an absolute location determination can be found for the mobile unit, with reference to an external location reference system. For example, in preferred embodiments, the mobile unit may use a satellite positioning system, such as the Global Positioning System (GPS), or, in the future, Galileo to determine its position absolutely with respect to an external reference system (i.e. the global grid reference system), and then this location can be compared to the known locations of the media sinks in the same reference system, to determine which media sink should be active. The media source then provides media contents data to the appropriate media sink, in dependence on the absolute location of the user.
With the above arrangements, therefore, location dependent media streaming can be achieved, in that media contents data can be streamed to the appropriate media sink, which is in the most appropriate location to reproduce the media contents for the user. Thus, for example, when listening to music as the user moves from room to room of their home, the music will “follow” the user from room to room, being successively reproduced by the speakers located in each room, while the user is present in the same room as the speakers.

Description of the Preferred Embodiments

A first embodiment of the present invention will now be described with respect to Figures 1 to 4.

Within the first embodiment of the invention, various media sinks are provided spatially distributed from each other, for example in different rooms of a house. The user carries a mobile unit, which is provided with a short range wireless transceiver for communicating with the media sinks. The media sinks are similarly provided with short range wireless transceivers. The mobile unit is further provided with a media source, for example a media store such as a hard disk drive or the like, on which is stored contents data. In other embodiments, the media source may be, for example, a TV or radio receiver. As the user moves around, carrying the mobile unit, the short range wireless transceivers of the mobile unit and the media sinks are used to determine when the mobile unit is in the proximity of a media sink, by virtue of a received signal strength indication (RSSI) of the short range radio signal. When a media sink is activated, because it is detected that the mobile unit is in the proximity thereof, then a data connection is established between the respective wireless transceivers of the media sink and the mobile unit, and media contents data is streamed over this link to the media sink, for reproduction thereat.

More particularly, as shown in Figure 1, a mobile unit 10 comprises a controller 12, which controls a short range wireless transceiver 14, provided with an aerial 18, for the transmission and reception of wireless signals. Further provided in the mobile unit 10 is a media store 16, such as a hard disk drive, or the like, on which is stored media contents data, such as, for example, audio and/or video data. The wireless transceiver
14 is capable of locating other wireless transceivers, and establishing a data connection therewith, for the transmission of media contents data thereto. The wireless transceiver 14 may, for example, be a Bluetooth transceiver, or the like.

A plurality of media sinks 20 and 20' are provided, spatially distributed, for example with one media sink in each room of a home. Each media sink 20 and 20' comprises a corresponding short range wireless transceiver 24, 24', as well as a controller 22, 22', and, for the reproduction of audio data, a pair of speakers 28. Additionally, some of the media sinks may also be configured to reproduce video data, and hence, as shown, the media sink 20' is further provided with a display screen 26. As mentioned, the respective wireless transceivers in the mobile unit 10 and the media sinks are able to locate each other by virtue of the transmission and reception of “inquiry” messages, and are further able to process metrics of received signals, so as to determine, for example, measures of received signal strength which can then be output as a received signal strength indicator (RSSI) to the respective controller. The respective controllers of the mobile unit 10 and the media sinks 20 and 20' control the wireless transceivers, as well as any media source, so as to select whether a media sink should be activated, and as to whether a data connection should be established between the mobile unit 10 and a media sink, for the transmission of media contents data from the mobile unit 10 to a particular media sink. Further details of the operation of the controllers, as well as the operation of the overall arrangement will be described further with respect to Figures 3 and 4.

More particularly, Figure 3 illustrates a flow diagram illustrating the steps performed by the mobile unit 10 within the first embodiment. Figure 4 illustrates a flow diagram of the corresponding steps performed by a media sink 20, 20', in the first embodiment.

Referring first to Figure 3, firstly, at step 3.2 the controller 10 controls the wireless transceiver 14 to transmit an inquiry message from antenna 80. As is known in the art, short range wireless protocols such as Bluetooth and the like provide for similarly equipped devices to locate each other by the transmission of inquiry signals, to which a response can then be made by a receiving device. In this way, similarly equipped devices can locate each other and share information over the wireless link.
If no response is received to an inquiry signal transmitted from the mobile unit, then the mobile unit keeps periodically transmitting an inquiry signal, until a response is received from a media sink.

As shown at step 4.2 the media sinks each monitor for and respond to a received inquiry signal from the mobile unit 10. That is, the controller 22 of each media sink controls the wireless transceiver 24 so as to be in a listening mode, listening for received inquiry signals, and to respond to any received inquiry signal with a response signal.

Returning to Figure 3, at step 3.4 once a response has been received to an inquiry signal by the wireless transceiver, the controller controls the wireless transceiver 14 to determine the received signal strength of each response signal which was received. That is, the wireless transceiver 14 in the mobile unit 10 may have received multiple response signals in response to an inquiry signal, meaning that the mobile unit can effectively “see” several media sinks. However, in a radio environment this is typical, as even short range wireless signals can sometimes travel through partition walls between rooms. However, the received signals will have differing signal strengths depending upon the medium they have travelled through, and the distance from the transmitter. Therefore, the wireless transceiver 14 in the mobile unit 10 will be able to determine different received signal strengths for each received response signal.

At step 3.6 the controller 12 determines whether a media connection has already been established using the wireless transceiver 14 with a media sink. If no such media connection has already been established, then the controller 12 selects the media sink which provided the strongest response signal, at step 3.8, on the assumption that the strongest signal represents the closest media sink. At step 3.10 the controller controls the wireless transceiver 14 to establish a media connection to the media sink with the strongest received signal strength, and once the connection has been established, at step 3.12 the controller controls the wireless transceiver 14 to stream media contents data from the media store 16 over the media connection provided by the short range wireless link.

Returning to step 3.6, if the controller 12 had determined at this step that a media connection was already established with another media sink then the controller would
have moved to step 3.14 in its operation, wherein it compares whether a response signal has been received from a media sink which has a stronger received signal strength than the signal being received from the media sink to which a media connection already exists. If this is not the case i.e. none of the response signals received are stronger than signals received from the already connected sink, then the procedure continues back to step 3.2, and the media connection is maintained with the existing connected sink, and media continues to be streamed over the connection for reproduction at that sink.

However, if it is determined at step 3.14 that a response has been received from a media sink which is stronger than a response received from the media sink to which a media connection has already been established, then at step 3.16 the existing media connection with the already connected sink is disconnected, and then the procedure proceeds to step 3.8, as previously described. In this way, the controller 12 in the mobile unit 10 can continually monitor, via the wireless transceiver 14, whether the mobile unit is still within the proximity of a media sink to which it is providing media contents data, or whether it should establish a connection to another media sink, for example, because the user has moved rooms, and is now within the proximity of a different media sink. Thus, the mobile unit 10 is able to continually determine whether media contents data is being provided to an appropriately located media sink, in dependence on the user’s location.

Returning to Figure 4, after having responded to an inquiry signal from the mobile unit, a media sink may receive a media connection request from the mobile unit’s wireless transceiver 14, at step 4.4. If such a media connection request is received, then at step 4.6 the controller 22, 22’ within the media sink 20, 20’ instructs its respective wireless transceiver 24 to establish a media connection with the mobile unit 10 contained in the media source. Once the media connection is established, at step 4.8 media contents data is received over the media connection, in a streaming manner, and the media sink then reproduces the streamed media contents data at step 4.10, in a manner appropriate to the data. For example, if the streamed data is audio data, then it is reproduced via the speakers 28. Alternatively, if the streamed data is video data, then, if available, it is reproduced via a suitable display screen 26. The media sink continues reproducing received data until the media connection between the mobile unit 10 and the particular media sink is disconnected, as may occur at step 4.12. In this case, the operation of the
media sink returns to step 4.2, where it continues to monitor for and respond to inquiry signals transmitted by the transceiver 14 in the mobile unit 10.

An example of the operation in accordance with the above can be seen when comparing Figures 1 and 2. In Figure 1 the mobile unit 10 is closer to media sink 20, and has established a data connection therewith, indicated by the large two way arrow. Media contents data can then be streamed by the wireless transceiver 14 in the mobile unit 10 over the media connection to the wireless transceiver 24 in the media sink 20, and then fed to the controller 22, for subsequent reproduction, for example by speakers 28. In Figure 2, the mobile unit 10 has changed position, and is now closer to media sink 20'. In this case, the media connection between the wireless transceiver 14 and the wireless transceiver 24 in media sink 20 is disconnected, and a new media connection is established between the respective wireless transceivers of the mobile unit 10 and the media sink 20'. Because the media sink 20' is also equipped with a display 26, then video data can also be reproduced, as shown, in addition to audio data. Moreover, it will be seen that the wireless controller 10 continues to output enquiries on a regular basis, to determine whether it is leaving the proximity of media sink 20'. Likewise, the other media sinks 20 continue to respond to the inquiry signals. However, only when a response signal from a media sink 20 becomes stronger than the received signal strength of signal transmitted from media sink 20', will the handover process take place, as described previously.

Within the first embodiment described previously, it is the mobile unit 10 which transmits the inquiry signals, so as to be able to allow the mobile unit 10 to locate wireless sinks. However, in a second embodiment, described next, instead of the mobile unit 10 transmitting inquiry signals, the media sinks each transmit inquiry signals, for receipt by the mobile 10. The advantage of this arrangement is that the media sinks will typically be mains powered and hence can repeatedly send out inquiry signals without depleting any power source, such as a battery or the like. In contrast, within the mobile unit, given that it no longer has to send out inquiry signals, the mobile unit can simply receive inquiry signals from the various media sinks, and then determine the received signal strengths of signals from each visible media sink, based on the inquiry signals. The controller 12 within the mobile unit 10 can then select the sink to which it wishes to connect in the same manner as before. Figures 5 and 6
illustrate the operation of the mobile unit 10 and the media sinks in accordance with this second embodiment, from which it will be seen that the operation of the elements of the second embodiment differs from those of the first embodiment only insofar as units transmit and receive inquiry signals. More particularly, in Figure 5, showing the operation of the mobile unit 10, at step 5.2 the mobile unit monitors, via the wireless transceiver 14 therein, media sink inquiry signals transmitted from the media sinks. Thereafter, however, the operation of the mobile unit 10 is identical to that previously described, with the difference, at step 3.4, that the received signal strength is determined based on the received inquiry signals.

At the media sinks, the operation is changed only by virtue of step 6.2 at the start, in that the media sinks repeatedly transmit inquiry signals over the short range radio link provided by their respective wireless transceivers, unless a media connection is established with the mobile unit 10. Otherwise, the operation is identical to that described previously in the first embodiment, and therefore further description will be omitted. As mentioned, however, the second embodiment has the advantage over the first embodiment that the mobile unit 10, which will typically be battery powered, does not have to continually transmit inquiry signals, to determine whether media sinks are nearby.

A third embodiment will now be described with respect to Figures 7 to 11. Within the third embodiment the location of the user is determined in a similar manner as to the first and second embodiments, i.e. a relative location determination is determined between a mobile unit carried by the user, and the various media sinks which are spatially arranged, for example in different rooms of a house. Moreover, the relative determination is performed in the same manner as before, i.e. by determining received signals strengths based on inquiry signals transmitted using a short range radio system, such as Bluetooth, or the like. However, different to the first and second embodiments, within the third embodiment instead of the mobile unit comprising a media source which is able to provide media contents data to the media sinks, a central media server is provided which contains a media source, such as a media store storing media contents data, or a media contents data receiver, such as a TV receiver, radio receiver, or the like. In other embodiments the media source may, for example, be a player such as a DVD
player or the like. The media source provides media contents data to the appropriate media sink in dependence on the proximity of the mobile unit 70 to the media sink.

More particularly, with reference to Figure 7 within the third embodiment a mobile unit 70 to be carried by the user comprises a controller 72 and a wireless transceiver 74, which transmits wireless signals over a short range wireless link via antenna 76. A plurality of media sinks 80 and 80' are provided, each of which comprise a controller 82, a wireless transceiver 84, and an antenna 86. Additionally provided is a media reproduction unit such as speakers 88, or, in the case of media sink 80', an additional display screen 85. Each of the media sinks is configured to communicate with a media server 90, comprising a media controller 94, and a media store 92. The media store 92 stores media contents data, such as audio and video files. Moreover, as mentioned, as an alternative or in addition to the media store, the media server 90 may comprise another media source such as a receiver, or player. The media sinks communicate with the media server 90 via communications links, which may be wired links, or wireless links. For example, an Ethernet wired link may provide communications between the media sinks and the media server, or, for example, an IEEE 802.11x wireless link may be used. Various other connection technologies may also be used to connect the media sinks to the media server 90.

Within the third embodiment as mentioned the principle of detecting inquiry signals passed between the mobile unit 70 and the media sinks is used, to determine whether the mobile unit 70 carried by the user is in the proximity of any particular media sink. When a media sink detects the mobile unit 70 in its proximity, then it requests the media server 90 to begin streaming media contents data to the particular sink, which then reproduces the received media contents data. Further details of this operation will be described with respect to Figures 9, 10, and 11 next.

Figure 9 illustrates the operation of the mobile unit 70. In this embodiment the operation of the mobile unit is extremely simple, as the only purpose of the short range wireless link provided by the wireless transceiver 74 in the mobile unit 70 is to monitor for media sink inquiries, performed at step 9.2, and then respond to a media sink inquiry when such an inquiry is received, at step 9.4. Because it is the media sinks that send the inquiry messages, the media sinks determine whether the mobile unit is within their
proximity, and hence whether they should commence operating. The operation of the media sinks is shown in Figure 10.

More particularly, at step 10.2 each media sink transmits inquiry messages using its respective wireless transceiver 84, 84’. When a mobile unit comes within range of the wireless transceiver of a media sink, it receives the transmitted inquiry signals, and responds thereto, as previously described. Therefore, each media sink continues repeatedly sending out inquiry signals until a response is received from the mobile unit, thus indicating that the mobile unit is in the proximity of the particular media sink. In this respect, the transmission strengths of the inquiry signals transmitted from the media sinks can be altered, so as to provide a zone of operation in which a media sink will operate. That is, when a media sink transmits an inquiry signal with a strong signal, then the media sink’s zone of operation will be larger. Conversely, when a media sink transmits an inquiry signal with a weak transmission strength then the mobile unit 70 will need to be closer to the media sink in order to adequately receive and demodulate the signal before it can then reply to the inquiry signal. In this case, the zone of operation of the media sink will be less.

When a media sink receives a response message from a mobile unit at step 10.4, then at step 10.6 the controller 82 of the media sink determines whether the media sink is already reproducing streamed media i.e. whether it is receiving media contents data from a media server 90. If this is the case, then the operation of the media sink proceeds to step 10.10, where it continues to receive the media contents data being streamed from the media controller 94 of the media server 90. At step 10.12 the streamed media is reproduced, and step 10.12 repeats continuously whilst stream media is being received, until streamed media is no longer received, wherein the media sink operation returns to step 10.2.

If at step 10.6 the media sink controller determines that a media sink is not already reproducing streamed media, i.e. the wireless transceiver 84 in the media sink has just received a first response message to its messages, then at step 10.8 the controller 82 signals the media controller 94 in the media server that the mobile unit 70 is in the vicinity of the media sink, and that the media server 90 should begin streaming media contents data to that sink.
Thus, media sinks can detect when the mobile unit 70 carried by the user is in the proximity of themselves, and in response request the media server 90 to begin streaming media contents data thereto. Media contents data is then streamed to the media sink which last requested it, until a different media sink requests media contents data, in which case the media server then switches the streaming to the newly requesting media sink. This is shown in Figure 11.

More particularly, at step 11.2 the media server 90 receives a signal from a media sink that the mobile unit 70 is in the vicinity of that media sink. The media controller 94 then checks whether it is already streaming media contents data to another media sink, and if this is the case, at step 11.6 it stops streaming media to that existing sink, and then at step 11.8 starts streaming media contents data to the media sink from which the last media contents data request was received. Additionally, if at step 11.4 the media controller determined that it was not streaming media contents data to any media sink, then the operation would proceed direct to step 11.8.

Figures 7 and 8 together give an example of the above operation. In Figure 7 the mobile unit 70 is nearest to the left hand media sink 80, and as a result the media server 90 is streaming media contents data to the left hand media sink 80, which is then reproducing that data, for example using speakers 88.

In Figure 8 the controller 70 has moved, and is now in the proximity of media sink 80'. In this case, the media server 90 then begins streaming data to the media sink 80', as shown by the arrow. Because the media sink 80' is also equipped with display 85, then it is also able to show video data, as shown.

Thus, within the third embodiment received signals from a short range radio link are used to determine whether a mobile unit carried by a user is within the proximity of a media sink, to determine whether that media sink should be activated. The media contents data itself is, however, provided from another media source, such as provided from media server 90.
A fourth embodiment of the invention will be described with respect to Figures 12 to 15. Within the fourth embodiment media contents data is provided to media sinks from a central media source, but the location detection technology differs from the previously described embodiments, in that it is dependent upon RF tag technology, as is well known in the art.

More particularly, RF tag technology is used in many retail stores to protect items on sale and comprises RF circuits which, when placed in a suitable RF detection field are able to generate a signal which can then be detected by an RF tag detector. RFID systems provide a refinement of this idea by providing RF circuits which are able to provide ID information in response to an energising RF field. Additionally, active RF tags are also known, which contain small power sources to enable the RF tag to actively broadcast a signal, thus giving greater reliability, and increased range. Additionally, semi-passive RF tags are known, which contain a power source to power the circuit but use reflective RF energy to transmit a signal. Completely passive RF tags are also available, which use the energy of the detection field for their operation.

Within the fourth embodiment the user is provided with an RF tag 100 which may be an RF ID tag unique to that user. Each of the media sinks 1, 10, 110' is provided with an RF tag detector 112, which emits an RF detection field via antenna 116, 116'. The RF tag detector 112 operates under the command of a controller 114. Each media sink is also provided with a media reproduction means, such as speakers 118, or, in the case of media sink 110', a display screen 115. The respective controllers of the media sinks communicate with a media server 120, which is provided with a media controller 122, and a media store 124, such as a hard disk drive or the like, and which stores media contents data. Additionally or alternatively provided within the media server 120 may be a different media source, such as, for example, a receiver such as a TV or radio receiver, or a media player, such as a DVD player.

In operation, within the fourth embodiment the user carries the RF tag 100 on his or her person, and the RF tag detectors 112 in the media sinks emit a detection field out to their operating range, to detect when the RF tag 100 enters the detection field. When the RF tag 100 is detected in the detection field of a media sink, then the controller 114 of that media sink sends a message to the media server 120, requesting that the media
server serve the media sink with media contents data. Further details of this operation can be seen in Figures 14 and 15.

More particularly, Figure 14 illustrates the operation 1 of the media sinks 110, 110’. In particular, at step 14.2 the RF tag detectors of the media sinks each monitor for the RF tag, to see if the RF tag appears within the respective detection field. If the RF tag 100 appears within the detection field of a media sink, then at step 14.4 the media sink detects the RF tag. The controller of the media sink then determines at step 14.6 whether the media sink is already reproducing streamed data, and if this is the case then it continues to receive streamed media contents data from the media controller 122 of the media server 120, at step 14.10, the stream media is then reproduced at step 14.12. In contrast, if at step 14.6 it is determined that no streamed media is being reproduced presently, then the controller 114 in the media sink signals the media controller 122 of the media server 120 that the RF tag detector of the sink has detected the RF tag within its detection field, and that the media server should commence streaming media contents data to the media sink. This is performed at step 14.8.

The operation of the media server 120 is shown in Figure 15. As will be seen, the steps performed in Figure 15 are identical to the steps performed by the media server of the third embodiment just described, and hence the operation need not be further described here. The fourth embodiment therefore differs from the third embodiment in terms of the detection technology used, being in this case RF tag technology, rather than short range wireless technology. In some respects, RF tag technology is more reliable, and detection fields of RF tag detectors can be tuned to quite specific areas by appropriate tuning of the RF tag detector detection fields. Inadvertent detection of the RF tag within the detection field can thus be avoided, and the location dependency of the streaming of the media contents data rendered more accurate.

The use of RF tag detection technology also provides a further advantage. Because the RF tag can contain a unique RF ID, then multiple users could each be issued with their own RF tag, each with their own RF ID. The RF tag detectors can then detect the RF ID, and feed the ID back to the media server 120. Each user may have controlled the media server to serve different media contents data, and by keeping track of which RF tag has been detected by which media sink, the media server can serve the appropriate
media contents data for each user to the appropriate media sink. Thus, multiple users can use the system at the same time, having their own respective media content following them from media sink to media sink.

Figures 12 and 13 give an example of the operation of the fourth embodiment, wherein the RF tag has moved between media sinks, and the reproduction of the media contents data has followed the RF tag from a first media sink to a second media sink.

The previously described embodiments make use of location determination technology which gives a relative location between the mobile item carried by the user, such as mobile unit 70, or RF tag 100, and the media sink. This is because the previous location determination technologies depend upon the mobile unit simply coming within a certain range of a media sink, and a media sink then being activated. However, in the remaining embodiments to be discussed an absolute location determination technique is employed, wherein the absolute location of the mobile unit carried by the user is determined with reference to an external spatial reference system. Additionally, the locations of the media sinks are also known with reference to the same external reference system. A comparison of the absolute locations can then be made to determine which media sinks should be operating at any particular time.

To provide an absolute location determination, within the remaining embodiments to be described the mobile unit is provided with a receiver capable of receiving timing signals from a satellite positioning system, such as the GPS system, or, in the future, the Galileo system. The satellite positioning system receiver then translates the received timing signals into a determined location, which can then be compared with the known locations of media sinks, and an appropriate media sink then chosen in dependence on the location. For example, simply the closest media sink may be chosen. Alternatively, for particular areas in which the mobile unit may find itself, a media sink may be selected even though it is not necessarily the closest media sink. Thus, for example, the area of a room may be stored, such that if the mobile unit finds itself anywhere in that room, then the media sink in that room is activated, even though, in terms of absolute distances, the mobile unit may be closer to another media sink in a different room, through a dividing wall.
A fifth embodiment of the invention which makes use of a satellite positioning system will be described next with respect to Figures 16 to 19. More particularly, in Figure 16 a mobile unit 130 carried by a user comprises a controller 132, a satellite positioning receiver 134, provided with an antenna 135 for receiving satellite positioning system signals, and a short range wireless transceiver 136, such as a Bluetooth transceiver, or the like. The short range wireless transceiver 136 is provided with an appropriate antenna 133 for transmitting and receiving short range wireless signals. In this embodiment, media contents data is stored in the mobile unit 130 itself, and provided to media sinks over a media data using the short range wireless link. Therefore, the mobile unit 130 contains a media source, in this case in the form of media store 137, which may be a hard disk drive or the like, on which is stored media contents data. Additionally provided is a sink location store 138, which contains media sink location data relating to the absolute location of media sinks, together with, optionally, area data concerning in which area a mobile unit may find itself in order to activate a particular media sink. Therefore, for each media sink its location is stored, as well as, optionally, activation area information.

In this embodiment the media sinks themselves can be relatively simple, comprising a controller 144, and a wireless transceiver 142 for communicating using the short range wireless communications link. The wireless transceiver 142 has an appropriate antenna 145. Appropriate media reproduction means, such as speakers 146, or display 148 are also provided.

The operation of the fifth embodiment is shown in Figures 18 and 19. In summary, the mobile unit 130 containing the SPS receiver determines its location, and provides the location to the controller 132. The controller 132 compares the determined location from the SPS receiver with the stored media sink locations in the sink location store 138, and, optionally, against the media sink activation areas which may be stored in the sink location store. The controller 132, depending on its mode of operation, then determines either the closest media sink, or determines whether the mobile unit is within the activation area of a media sink. An appropriate media sink is then selected, being either the closest media sink, or the media sink within which the mobile unit finds itself within that media sink’s area of operation. The controller 132 then controls the wireless transceiver 136 to establish a media data connection with the selected media sink, and
once the media data connection is established, the controller 132 controls the wireless transceiver 136 to stream media contents data over the media data connection from the media store 137. At the receiving sink the media contents data is then reproduced.

Therefore, as shown in Figure 18 at step 18.2 the mobile unit performs a position fix using the satellite positioning system receiver. At step 18.4 the controller 132 maps the determined position to the sink location stored in the sink location store 138. At step 18.6 a determination is made as to whether a media data connection is already established, and if this is the case then at step 18.14 a determination is made as to whether there is a closer sink than the presently connected sink. Of course, if in the mode of operation media sink activation areas are used, this step may not be performed. If there is a closer sink than the presently connected sink, then the media connection with the presently connected media sink is disconnected at step 18.6, and then the closest sink is selected at step 18.8. The short range wireless link is then used to establish a media data connection to the closest sink at step 18.10, and thereafter media contents data is streamed over the connection to the selected media sink.

At the media sink the operation is very straightforward, in that each media sink need only wait for a media connection request, and then reproduce whatever media is streamed to it over such a media connection. All of the intelligence within the system is therefore within the mobile unit 130, and each media sink accedes to media data connection requests, and then reproduces any media contents data which is streamed thereto over an established media data connection. Therefore, at step 19.2 a media sink would receive a media connection request from the mobile unit 130, and at step 19.4 establish the media data connection with the mobile unit. At step 19.6 streamed media contents data is received from the media source in the mobile unit 130, and this is then reproduced at step 19.8. The reproduction of the streaming media then continues, until the media connection is disconnected by the mobile unit 130.

Figure 17 illustrates the mode of operation where the mobile unit is in “area activation” mode, wherein it relies on activation area information for each media sink. Therefore, whilst, as shown in Figure 16, the media sink 140 which is closest to the mobile unit 130 is activated, whereas in Figure 17 the mobile unit 130 is closer to media sink 140’, and yet still the same media sink as shown in Figure 16 is shown as activated. This may
be because this is still the most appropriate media sink to be activated, even though in
terms of absolute proximity the media sink 140’ is closer. For example, there may be a
dividing wall between the location of mobile unit 130 and media sink 140’, as shown.

A sixth embodiment will now be described with respect to Figures 20 to 23. The sixth
embodiment can be thought of as a combination of the fifth embodiment just described
which makes use of the satellite positioning system to determine location, but, instead
of having the media source within the mobile unit itself, a central media server is
provided having a media source, as well as the sink location store. In this embodiment
the media sinks themselves are essentially dumb terminals, receiving media contents
data from the central media server, and simply reproducing it. No location
determination components are required in the media sinks, and hence the media sinks
can be made at much lower cost. In view of the fact that there may be many media
sinks located throughout the home, this feature is particularly advantageous.

Within the sixth embodiment a mobile unit 150 is carried by a user about their person.
The mobile unit 150 comprises a satellite positioning system receiver 152, provided
with an appropriate antenna 153. The satellite positioning system receiver 152 feeds
location information to the unit controller 154, which controls a wireless transceiver
156, provided with antenna 155, to transmit the determined location over a short range
wireless link, such as a Bluetooth link. Alternatively, to provide greater range, the
wireless transceiver 156 in the mobile unit 150 may use a different signalling protocol,
for example wireless signalling protocols belonging to the IEEE 802.11x family of
standards. As mentioned, a plurality of media sinks are provided, but each of these are
essentially dumb terminals, comprising merely a controller 162, and appropriate media
reproduction means, such as speakers 164, or display 166. A central media server 170
is provided having a media controller 172, a wireless transceiver 178 provided with
antenna 179, and a media source, such as media store 174. Media store 174 may be a
hard disk drive or the like. Additionally, further media sources may be provided such as
receivers, such as TV or radio receivers, or players such as DVD players. Furthermore,
the media server 170 in this embodiment comprises a sink location store 176 which
stores absolute location information relating to the location of each media sink.
Additionally, media sink activation area information may be stored for each media sink,
being information which defines an area of activation for that media sink, such that if
the mobile unit finds itself within that area of activation, then the media sink to which the area of activation relates is activated.

The general operation is as follows. The SPS receiver in the mobile unit 150 performs repeated position fixes to determine the location of the mobile unit, carried by the user. The location information is transmitted using the wireless transceiver 156 to the wireless transceiver 178 in the media server 170, and the media controller therein compares the position information with the media sink location information stored in the sink location store 176. The media controller then selects a media sink to be activated, and streams media contents data to the selected sink. As the mobile unit 150 moves around with the user, the media controller 172 changes the selection of the media sink which is presently active in dependence on the received location information from the mobile device. In this way, the streaming of the media contents data can be made to follow the user from room to room.

Figures 22 and 23 illustrate the operation of the embodiment in more detail. More particularly, Figure 22 illustrates the operation of the mobile unit 150. Here, the SPS receiver 152 performs repeated position fixes at step 22.2, and at step 22.4 each position fix is communicated to the media controller in the media server 170 using the wireless transceiver in the mobile unit 150 and the media server 170.

Within the media server 170, when a position fix is received from the mobile unit at step 23.2, then the media controller 172 maps the position received to the media sink locations at step 23.4. The most appropriate media sink to the mobile unit is then selected at step 23.6, which may, for example, be the closest media sink, or, the media sink in which the mobile unit falls within its activation area, depending on the mode of operation. If the media server is already streaming media to the existing sink as determined at step 23.8, then the media data continues to be streamed to the determined sink at step 23.12. However, if media is being streamed to a different sink to that which is being determined, then media contents data is stopped from being streamed to the existing sink at step 23.10, and then media streaming commences to the determined sink at step 23.12, as described.
Therefore, within the sixth embodiment absolute location information can be used to determine which media sink is active and moreover media contents data can be streamed from a central media server to the most appropriate media sink. Therefore, as with the previous embodiments media contents can follow a user from room to room, but as the location information is determined more accurately, thus the media sinks can be activated more accurately, and in particular specific to each room. Figures 20 and 21 illustrate how media contents reproduction follows the mobile unit 150 from media sink to media sink.

Various additions, alterations, or other modifications may be made to the above described embodiments to provide further embodiments. For example, within the embodiments described an immediate switchover between media sinks was performed, when it was determined that there was a more appropriate media sink to be activated. However, in other embodiments the previous media sink may continue operation for a small amount of time after the newly activated media sink begins operation, to provide for a smoother handover. Such a mechanism is particularly applicable to the situation when media contents data is being provided from a central media server, as the media server maintains streaming media contents data to the previous media sink, and starts streaming media contents data to the new media sink. The streaming of media contents data to the previous media sink is then stopped after a short amount of time.

Further modifications, and additions will be apparent to the person skilled in the art to provide further embodiments of the invention which make use of the inventive concept of the invention, and which are therefore intended to fall within the scope of the appended claims.
Claims

1. A system for reproducing media content, comprising:
   i) a mobile unit for carrying, in use, on a user’s person;
   ii) one or more media sinks each comprising at least one media content
       reproducing apparatus for reproducing media content data provided thereto;
   iii) at least one media content source from which media content is provided;
       and
   iv) at least one controller, the controller being configured to determine the
       location of the mobile unit with respect to the location(s) of the one or more media
       sinks, and to select a media sink for reproducing media content in dependence on the
       respective locations;
       wherein the media source is controlled to provide media content data to the
       selected media sink for reproduction thereby.

2. A system according to claim 1 wherein the mobile unit and the media sinks
   further comprise respective wireless transmitters and receivers for the exchange of
   wireless signals therebetween, wherein the controller determines relative locations of
   the mobile unit and the or each media sink in dependence on at least one property of the
   exchanged wireless signals.

3. A system according to claim 2, wherein a received signal strength indication
   (RSSI) is determined for signals exchanged between the wireless transmitters and
   receivers of the mobile unit and the media sinks, the controller selecting a media sink
   for reproduction in dependence on the determined RSSI.

4. A system according to claim 3, wherein the RSSI of signals transmitted by the
   media sinks to the mobile unit is determined, and the controller selects a media sink in
   dependence thereon.

5. A system according to claim 3, wherein the RSSI of signals transmitted by the
   mobile unit to the media sinks is determined, and the controller selects a media sink in
   dependence thereon.
6. A system according to claim 5, wherein a controller is provided in each media sink, each controller selecting whether the media sink in which it is situated should be activated to reproduce media content data in dependence on the signal received at the respective media sink.

7. A system according to any of the preceding claims, wherein the mobile unit comprises an RF circuit, and the media sink comprises an RF circuit detector configured to detect if the RF circuit enters a detection zone thereof, wherein the controller determines a relative location determination between the mobile unit and the media sink in dependence on the RF detector detecting the RF circuit in the mobile unit within the detection zone of the detector.

8. A system according to claim 7, wherein the RF circuit is any of the group comprising: a passive RF circuit; an active RF circuit; a semi-passive RF circuit; an RFID circuit.

9. A system according to any of the preceding claims, wherein the mobile unit further comprises a satellite positioning system receiver arranged to perform location position fixes, wherein the controller selects a media sink for reproduction in dependence on the position fix.

10. A system according to claim 9, comprising a store in which media sink location data is stored for use by the controller in selecting the media sink for reproduction.

11. A system according to claim 10, wherein the media sink location data further comprises data defining an activation area for each media sink, such that if the mobile unit is positioned within a defined activation area then the media sink associated with that activation area is activated for reproduction.

12. A system according to any of the preceding claims, wherein the media source is located in the mobile unit, the mobile unit being provided with a wireless transmitter for transmitting media contents data to the selected media sink.
13. A system according to claim 12, wherein the controller is located in the mobile unit.

14. A system according to any of claims 1 to 11, and further comprising a media server, the media server having the media source provided therein, the media server providing media content data from the media source to the or each media sink selected by the controller from reproduction of the media content data.

15. A system according to claim 14, wherein the controller is located in the media server.

16. A mobile unit for use with a system according to at least claim 1, the mobile unit comprising:-
   i) at least one media content source from which media content is provided; and
   ii) at least one controller, the controller being configured to determine the location of the mobile unit with respect to the location(s) of one or more media sinks, each media sink comprising at least one media content reproducing apparatus for reproducing media content data provided thereto, and to select a media sink for reproducing media content in dependence on the respective locations; and
   iii) a media content data provision means for the provision of media contents data to the media sink;

   wherein the media source is controlled to provide, via the media content transmission means, media content data to the selected media sink for reproduction thereby.

17. A mobile unit according to claim 16 wherein the mobile unit further comprises a wireless transmitter and receiver for the exchange of wireless signals with the media sink(s), wherein the controller determines relative locations of the mobile unit and the or each media sink in dependence on at least one property of the exchanged wireless signals.

18. A mobile unit according to claim 17, wherein a received signal strength indication (RSSI) is determined for signals exchanged between the wireless transmitters
and receivers of the mobile unit and the media sinks, the controller selecting a media
sink for reproduction in dependence on the determined RSSI.

19. A mobile unit according to claim 18, wherein the RSSI of signals transmitted by
the media sinks to the mobile unit is determined, and the controller selects a media sink
in dependence thereon.

20. A mobile unit according to any of claims 16 to 19, wherein the media content
data provision means comprises a wireless transmitter.

21. A mobile unit according to claim 16, and further comprising a satellite
positioning system receiver arranged to perform location position fixes, wherein the
controller selects a media sink for reproduction in dependence on the position fix.

22. A media sink for use with a system according to at least claim 1, comprising:-
   i) at least one media content reproducing apparatus for reproducing
      media content provided thereto; and
   ii) at least one controller, the controller being configured to determine the
      location of a mobile unit with respect to the location of the media sink, and to request
      media content data from a media content source for reproduction in dependence on the
      respective locations, wherein media content data is requested if the controller
determines that the mobile unit is in the proximity of the media sink.

23. A media sink according to claim 22 further comprising a wireless transmitter
and receiver for the exchange of wireless signals with the mobile unit, wherein the
controller determines relative locations of the mobile unit and the or each media sink in
dependence on at least one property of the exchanged wireless signals.

24. A media sink according to claim 22, wherein a received signal strength
indication (RSSI) is determined for signals exchanged between the wireless transmitters
and receivers of the mobile unit and the media sink, the controller selecting a media sink
for reproduction in dependence on the determined RSSI.
25. A media sink according to claim 24, wherein the RSSI of signals transmitted by
the mobile unit to the media sink is determined, and the controller selects whether to
activate the media sink in dependence thereon.

26. A media sink according to claim 23, wherein the mobile unit comprises an RF
circuit which operates in response to RF energy being incident thereon, the wireless
transmitter and receiver in the media sink being arranged to energise and detect signals
from the RF circuit.

27. A media server suitable for use with a system according to at least claim 1, and
comprising:

i) at least one media content source from which media content is provided;

and

iii) at least one controller, the controller being configured to determine the
location of a mobile unit carried, in use, on a user’s person, with respect to the
location(s) of one or more media sinks, each media sink comprising at least one media
content reproducing apparatus for reproducing media content data provided thereto, the
controller being further configured to select a media sink for reproducing media content
in dependence on the respective locations;

wherein the media source is controlled to provide media content data to the
selected media sink for reproduction thereby.

28. A media server according to claim 27, wherein the controller receives position
information from the mobile unit, and compares the position information with stored
media sink location data relating to the location of the media sink(s) to select a media
sink for reproduction.

29. A media server according to claim 28, wherein the media sink location data
further comprises data defining an activation area for each media sink, such that if the
mobile unit is positioned within a defined activation area then the media sink associated
with that activation area is activated for reproduction.

30. A method of reproducing media content, comprising the steps:-
a) determining the location of a mobile unit which is carried, in use, on a user's person with respect to the location(s) of one or more media sinks each comprising at least one media content reproducing apparatus for reproducing media content data provided thereto;

b) selecting a media sink for reproducing media content in dependence on the respective locations of the mobile unit and the media sink(s);

c) controlling a media source which outputs media content data to provide media content data to the selected media sink for reproduction thereby; and

d) reproducing the media content data at the media sink.

31. A method according to claim 30 further comprising exchanging wireless signals between the mobile unit and the media sink, wherein the determining step determines relative locations of the mobile unit and the or each media sink in dependence on at least one property of the exchanged wireless signals.

32. A method according to claim 31, wherein a received signal strength indication (RSSI) is determined for signals exchanged between the wireless transmitters and receivers of the mobile unit and the media sinks, the controller selecting a media sink for reproduction in dependence on the determined RSSI.

33. A method according to claim 32, wherein the RSSI of signals transmitted by the media sinks to the mobile unit is determined, and the controller selects a media sink in dependence thereon.

34. A method according to claim 32, wherein the RSSI of signals transmitted by the mobile unit to the media sinks is determined, and the controller selects a media sink in dependence thereon.

35. A method according to claim 34, wherein the selecting step is performed in each media sink, and further comprises selecting whether the media sink in which it is performed should be activated to reproduce media content data in dependence on the signal received at the respective media sink.
36. A method according to any of claims 30 to 35, wherein determining step further determines a relative location determination between the mobile unit having an RF circuit therein and the media sink provided with an RF circuit detector in dependence on the RF detector detecting the RF circuit in the mobile unit within the detection zone of the detector.

37. A method according to claim 36, wherein the RF circuit is any of the group comprising: a passive RF circuit; an active RF circuit; a semi-passive RF circuit; an RFID circuit.

38. A method according to any of claims 30 to 37, further comprising performing a location position fix with a satellite positioning system receiver in the mobile unit, and selecting a media sink for reproduction in dependence on the position fix.

39. A method according to claim 38, further comprising storing media sink location data for use in selecting the media sink for reproduction.

40. A method according to claim 39, wherein the media sink location data further comprises data defining an activation area for each media sink, such that if the mobile unit is positioned within a defined activation area then the media sink associated with that activation area is activated for reproduction.

41. A method according to any of claims 30 to 40, wherein the media source is located in the mobile unit, the method further comprising transmitting media contents data to the selected media sink from the mobile unit using a wireless transmitter.

42. A method according to claim 41, wherein the determining and selecting steps are performed by a controller in the mobile unit.

43. A method according to any of claims 30 to 40, and wherein the media source is located in a media server, the method comprising providing media content data from the media source to the or each media sink selected for reproduction of the media content data.
44. A method according to claim 43, wherein the determining and selecting steps are performed by a controller in the media server.

45. A method of operating a mobile unit for use in a method according to at least claim 30, the mobile unit being carried, in use, on the person of a user, the method comprising:
   a) determining the location of the mobile unit with respect to the location(s) of one or more media sinks, each media sink comprising at least one media content reproducing apparatus for reproducing media content data provided thereto;
   b) selecting a media sink for reproducing media content in dependence on the respective locations; and
   iii) providing media contents data from a media content source to the media sink for reproduction thereby.

46. A method of operating a mobile unit according to claim 45, further comprising exchanging wireless signals with the media sink(s), and determining relative locations of the mobile unit and the or each media sink in dependence on at least one property of the exchanged wireless signals.

47. A method of operating a mobile unit according to claim 46, wherein a received signal strength indication (RSSI) is determined for signals exchanged between the wireless transmitters and receivers of the mobile unit and the media sinks, the controller selecting a media sink for reproduction in dependence on the determined RSSI.

48. A method of operating a mobile unit according to claim 47, wherein the RSSI of signals transmitted by the media sinks to the mobile unit is determined, and the controller selects a media sink in dependence thereon.

49. A method of operating a mobile unit according to any of claims 45 to 48, wherein the providing step comprises transmitting the media contents data to the media sink wirelessly.
50. A method of operating a mobile unit according to claim 45, and further comprising performing location position fixes using a satellite positioning system receiver, and selecting a media sink for reproduction in dependence on the position fix.

51. A method of operating a media sink for use in a method according to at least claim 30, comprising:-
   a) determining the location of a mobile unit with respect to the location of the media sink;
   b) requesting media content data from a media content source for reproduction in dependence on the respective locations, wherein media content data is requested if the controller determines that the mobile unit is in the proximity of the media sink; and
   c) reproducing media content data received in response to the request.

52. A method of operating a media sink according to claim 51, and further comprising exchanging wireless signals with the mobile unit, and determining relative locations of the mobile unit and the or each media sink in dependence on at least one property of the exchanged wireless signals.

53. A method of operating a media sink according to claim 52, wherein a received signal strength indication (RSSI) is determined for signals exchanged between the wireless transmitters and receivers of the mobile unit and the media sink, the controller selecting a media sink for reproduction in dependence on the determined RSSI.

54. A method of operating a media sink according to claim 53, wherein the RSSI of signals transmitted by the mobile unit to the media sink is determined, and the controller selects whether to activate the media sink in dependence thereon.

55. A method of operating a media sink according to claim 52, wherein the mobile unit comprises an RF circuit which operates in response to RF energy being incident thereon, the method comprising energising and detecting signals from the RF circuit using an RF transmitter and receiver provided in the media sink.
56. A method of operating a media server suitable for use in a method according to at least claim 30, the method comprising:

a) determining the location of a mobile unit carried, in use, on a user's person, with respect to the location(s) of one or more media sinks, each media sink comprising at least one media content reproducing apparatus for reproducing media content data provided thereto; and

b) selecting a media sink for reproducing media content in dependence on the respective locations; and

c) controlling a media source from which media content data is provided to provide media content data to the selected media sink for reproduction thereby.

57. A method of operating a media server according to claim 56, further comprising receiving position information from the mobile unit, and comparing the position information with stored media sink location data relating to the location of the media sink(s) to select a media sink for reproduction.

58. A method of operating a media server according to claim 57, wherein the media sink location data further comprises data defining an activation area for each media sink, such that if the mobile unit is positioned within a defined activation area then the media sink associated with that activation area is activated for reproduction.

59. A computer program or suite of computer programs so arranged such that when executed by a computer system it/they cause the computer system to operate in accordance with the method of any of claims 30 to 58.

60. A computer readable storage medium storing the computer program or at least one of the suite of computer programs according to claim 59.
Documents considered to be relevant:

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Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKPC:

- H4L
- H04L

Worldwide search of patent documents classified in the following areas of the IPC:

- H04L

The following online and other databases have been used in the preparation of this search report.
### International Classification:

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