

CLAIMS

1. An audio device comprising:
 - a first earbud configured to:
 - establish a first wireless link with an audio source; and
 - receive, from the audio source, audio information over the first wireless link;
 - a second earbud configured to:
 - establish a second wireless link with the audio source; and
 - receive, from the audio source, audio information over the second wireless link,wherein the first earbud and the second earbud are further configured to communicate with one another over a third wireless link;
 - wherein at least one of the first earbud and the second earbud comprises:
 - a measurement circuit configured to measure respective signal strengths of the first, second and third wireless links;
 - a computation circuit configured to compute a difference in signal strengths of the first and second wireless links; and
 - a determination circuit configured to determine an operating environment of the audio device based on the computed difference and further based on the signal strength of the third wireless link.
2. The audio device of claim 1, wherein the determination circuit is further configured to determine that the operating environment is an open field, based on determining that the computed difference exceeds a first threshold and further based on determining that the signal strength of the third wireless link is less than a second threshold.
3. The audio device of claim 2, wherein the first threshold is in a range of 6dB to 10dB.
4. The audio device of claim 2, wherein the second threshold is equal to, or lower than -85dB.
5. The audio device of claim 1, wherein both the first earbud and the second earbuds comprise:

a respective measurement circuit;
a respective computation circuit; and
a respective determination circuit.

6. The audio device of claim 1, wherein at least one of the first earbud and the second earbud comprises:

a controller circuit configured to control the first earbud to operate in a slave mode and to control the second earbud to operate in a master mode, based on the determination circuit determining that the signal strength of the first wireless link is lower than the signal strength of the second wireless link and further based on the determined operating environment.

7. The audio device of claim 6,

wherein the first earbud, when operating in the slave mode, is configured to transmit link information about the first wireless link to the second earbud operating in the master mode over the third wireless link, and

wherein the second earbud, when operating in the master mode, is configured to receive the link information about the first wireless link from the first earbud operating in the slave mode and is further configured to transmit status information that includes the received link information, to the audio source over the second wireless link.

8. The audio device of claim 6,

wherein the first earbud, when operating in the slave mode, is configured to stop receiving audio information over the first wireless link, and

wherein the second earbud, when operating in the master mode, is configured to relay the audio information received from the audio source, to the first earbud over the third wireless link.

9. The audio device of claim 1, wherein the determination circuit is further configured to determine that the audio source is playing an audio-visual media, based on determining that the signal strengths of each the first and second wireless links exceed a first media threshold and further based on determining that the computed difference is less than a second media threshold.

10. The audio device of claim 9, wherein the first media threshold is -70dB.
11. The audio device of claim 9, wherein the second media threshold is -85dB.
12. The audio device of claim 1, wherein the determination circuit is further configured to determine that the audio source is playing an audio-only media, based on determining that the signal strengths of each of the first and second wireless links are equal to, or below a first media threshold.
13. The audio device of claim 12, wherein at least one of the first and second earbuds comprises:
 - a buffer controller configured to increase a buffer size of the audio device based on the determined operating environment and further based on determining that the audio source is playing an audio-only media.
14. The audio device of claim 1, wherein at least one of the first and second earbuds comprises:
 - an operation mode controller configured to switch the audio device to operate in a sleep mode, based on the determination circuit determining that the signal strength of the third wireless link is larger than a sleep mode threshold continuously during a predefined duration,
 - wherein in the sleep mode, the first and second wireless links are disconnected.
15. The audio device of claim 14,
 - wherein the measurement circuit is configured to measure the signal strength of the third wireless link in the sleep mode,
 - wherein the operation mode controller is further configured to switch the audio device to operate in an active mode, based on the determination circuit determining that the signal strength of the third wireless link in the sleep mode is lower than an active mode threshold, and
 - wherein in the active mode, the first and second wireless links are established with the audio source.

16. An audio device comprising:
a first earbud configured to:
 establish a first wireless link with an audio source; and
 receive, from the audio source, audio information over the first wireless link;
a second earbud configured to:
 establish a second wireless link with the audio source; and
 receive, from the audio source, audio information over the second wireless link,
wherein the first earbud and the second earbud are further configured to communicate with one another over a third wireless link;
 wherein at least one of the first earbud and the second earbud comprises:
 a measurement circuit configured to measure signal strength of the third wireless link;
 a comparison circuit configured to compare the measured signal strength of the third wireless link against a predefined threshold during a predefined duration; and
 an operation mode controller configured to switch the audio device to operate in a sleep mode, based on the comparison indicating that the measured signal strength of the third wireless link is larger than the predefined threshold continuously during the predefined duration,
 wherein in the sleep mode, the first and second wireless links are disconnected.
17. The audio device of claim 16, wherein both the first earbud and the second earbud comprise:
 a respective measurement circuit;
 a respective comparison circuit; and
 a respective operation mode controller.
18. The audio device of claim 16,
 wherein the measurement circuit is configured to measure the signal strength of the third wireless link in the sleep mode,

wherein the comparison circuit is further configured to compare the measured signal strength of the third wireless link in the sleep mode against a further predefined threshold, and

wherein the operation mode controller is further configured to switch the audio device to operate in an active mode, based on the comparison indicating that the measured signal strength of the third wireless link in the sleep mode is lower than the further predefined threshold,

wherein in the active mode, the first and second wireless links are established with the audio source.

19. The audio device of claim 18, wherein the further predefined threshold is 10dB lower than the predefined threshold.

20. A method of operating an audio device comprising a first earbud and a second earbud, the method comprising:

establishing first and second wireless links with an audio source, by the first and second earbuds, respectively;

receiving in each of the first and second earbuds, audio information from the audio source, over the first and second wireless links, respectively;

the first earbud and the second earbud communicating with one another over a third wireless link;

measuring respective signal strength of the third wireless link, using a measurement circuit;

comparing the measured signal strength of the third wireless link against a predefined threshold during a predefined duration, using a comparison circuit; and

switching the audio device to operate in a sleep mode, based on the comparison indicating that the measured signal strength of the third wireless link is larger than the predefined threshold continuously during the predefined duration, using an operation mode controller,

wherein in the sleep mode, the first and second wireless links are disconnected.

21. The method of claim 20, further comprising:

measuring the signal strength of the third wireless link in the sleep mode, using the measurement circuit;

comparing the measured signal strength of the third wireless link in the sleep mode against a further predefined threshold, using the comparison circuit; and

switching the audio device to operate in an active mode, based on the comparison indicating that the measured signal strength of the third wireless link in the sleep mode is lower than the further predefined threshold, using the operation mode controller,

wherein in the active mode, the first and second wireless links are established with the audio source.

22. The method of claim 21, wherein the further predefined threshold is 10dB lower than the predefined threshold.