Claims

1. A radio communications device, comprising:

a headphone assembly comprising at least one aural speaker or transducer and a headphone cable functioning as an antenna and providing electrical signals carrying audio information to the at least one aural speaker or transducer;

a signal separator coupled to the headphone cable for separating the electrical signals carrying audio information transmitted to the headphone cable and radio frequency (RF) signals received from the headphone cable;

a radio receiver for receiving the RF signals from the signal separator and converting the RF signals to electrical signals carrying audio information;

a tuner for tuning the headphone cable to a selected operating frequency of the radio receiver; and

an audio amplifier for amplifying electrical signals carrying audio information from the radio receiver to be transmitted through the headphone cable to the at least one aural speaker or transducer.

2. The device of claim 1, further comprising a device housing having a headphone jack , an electrical interface, or an electro-mechanical interface, and wherein the signal separator, the radio receiver, the tuner, and the audio amplifier are located within the housing, and the headphone cable is located outside the device housing and is connected to the headphone jack, the electrical interface, or the electro-mechanical interface.

3. The device of claim 1, further comprising a device housing having a headphone jack, an electrical interface, or an electro-mechanical interface, and wherein the radio receiver and audio amplifier are located within the housing, and wherein the signal separator and the tuner are located outside the housing and are connected to the radio receiver through a second

cable connected to the headphone jack, the electrical interface, or the electro-mechanical interface.

4. The device of claim 3, further comprising a second housing, wherein the signal separator and tuner are located within the second housing, and the headphone cable and second cable are connected to the second housing.

5. The device of claim 1, wherein the tuner comprises a match network and/or impedance matched tuner and a controller for controlling the match network or impedance matched tuner.

6. The device of claim 5, wherein the match network includes a plurality of inductive and/or capacitive elements and corresponding switches, and wherein the controller switches inductive and/or capacitive elements in or out of a series path to the headphone cable, allowing the cable to resonate or function as a quarter-wave, half-wave, or $n\lambda/4$ antenna, where n is any integer.

7. The device of claim 5, wherein the match network includes a plurality of inductive and/or capacitive elements and corresponding switches, and wherein the controller switches the inductive and/or capacitive elements in or out of a pi, T-, L- or other matching network in a series path to the headphone cable, allowing the cable to resonate or function as a quarter-wave, half-wave, or $n\lambda/4$ antenna, where n is any integer.

8. The device of claim 5, wherein the tuner is controlled dynamically to adjust for proximity loading of the antenna in response to a control signal.

9. The device of claim 1, wherein the headphone cable comprises at least one RF cable functioning as the antenna, at least one audio conductor for providing electrical signals carrying audio information to the at least one aural speaker or transducer, and an audio/RF return or common ground.

10. The device of claim 1, wherein the operating band comprises VHF (high), VHF (low), FM, or UHF bands.

11. The device of claim 1, wherein the signal separator comprises a simple or multistage passive filter of L, T, or Pi design.

12. The device of claim 1, wherein the radio communications device is a tablet, netbook, or notebook computer or smartphone.

13. A method of operating a radio communications device having a headphone assembly comprising at least one aural speaker or transducer and a headphone cable functioning as an antenna and providing electrical signals carrying audio information to the at least one aural speaker or transducer, the method comprising the steps of:

(a) tuning the headphone cable to a selected operating frequency;

(b) separating the electrical signals carrying audio information transmitted to the headphone cable and radio frequency (RF) signals received from the headphone cable;

(c) converting the RF signals to electrical signals carrying audio information; and

(d) amplifying electrical signals carrying audio information to be transmitted through the headphone cable to the at least one aural speaker or transducer.

14. The method of claim 13, further comprising a device housing having a headphone jack, an electrical interface, or an electro-mechanical interface, and wherein steps (a) through (d) are performed within the housing, and the headphone cable is located outside the device housing and is connected to the headphone jack, the electrical interface, or the electro-mechanical interface.

15. The method of claim 13, further comprising a device housing having a headphone jack, an electrical interface, or an electro-mechanical interface, and wherein steps (c) and (d) are performed within the device housing, and wherein steps (a) and (b) are performed outside the device housing.

16. The method of claim 15, further comprising a second housing separated from and connected to the device housing by a second cable wherein steps (a) and (b) are performed within the second housing.

17. The method of claim 13, wherein step (a) comprises controlling a match network and/or impedance matched tuner.

18. The method of claim 17, wherein the match network includes a plurality of inductive and/or capacitive elements and corresponding switches, and step (a) comprises switching respective inductive and/or capacitive elements in or out of a series path to the headphone cable, allowing the cable to resonate as a quarter-wave, half-wave, or $n\lambda/4$ antenna, where n is any integer.

19. The method of claim 15, wherein step (a) comprises dynamically tuning the headphone cable to adjust for proximity loading of the antenna in response to a control signal.

20. The method of claim 13, wherein the headphone cable comprises at least one RF cable functioning as the antenna, at least one audio conductor for providing electrical signals carrying audio information to the at least one aural speaker or transducer, and an audio/RF return or common ground.

21. The method of claim 13, wherein the operating band comprises VHF (high), VHF (low), FM, or UHF bands.

22. The method of claim 13, wherein step (b) is performed using a signal separator comprising a simple or multistage passive filter of L, T, or Pi design.

23. The method of claim 13, wherein the radio communications device is a tablet, netbook, or notebook computer or smartphone.