TELEPATH SPORTS TRAINING SYSTEM

Abstract: A system of communication for providing instruction, information, and verbal commands between a teacher and a student. An exemplary embodiment of the invention is particularly suited for use between a sports coach and the players on his or her team. The system of the present invention is preferably comprised of a microphone for the coach, a transmitter, at least one receiver, and at least one speaker for at least one player.

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TELEPATH SPORTS TRAINING SYSTEM

This application claims the benefit of U.S. Provisional Application Serial No. 60/555,636, filed on March 23, 2004, which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

The present invention relates to a system of communication for providing instruction, information, and verbal commands between a teacher and a student. An exemplary embodiment of the invention is particularly suited for use between a sports coach and the players on his or her team.

Sports are an important part of American culture. Most people start playing sports at a young age, and quite a few continue to play into their adult years. Most youth sports teams have one or more coaches to keep them organized and teach fundamentals. The present invention would help a coach communicate with his or her players during practice sessions. Additionally, the system of the present invention may be used in practice games (i.e., scrimmages) or used, if permitted, during actual game play.

Helmets containing communications systems are known in the prior art. For example, Shindona (U.S. Patent No. 4,833,726) teaches a helmet which embodies a two-way radio communications suite. However, the intended use for such a helmet is, for example in the construction industry, wherein the helmet is designed for shock absorption which can cause the invention to be relatively bulky, heavy, and consequently unsuitable for sports training applications where such methods would encumber a student athlete. Lai (U.S. Patent No. 6,732,381) teaches a sports helmet which embodies communications systems such as an MP3 player, a radio, and a cellular telephone but is not intended for use as a training aid between a
coach and player and is not useable in a wide variety of sports, such as soccer, football, baseball, softball, lacrosse, and field hockey. Silverman (U.S. Patent No. 5,251,326) teaches a two way method of communication between a coach and student, but this invention is intended for water sporting activities in or on the water.

What is needed is an improved lightweight wireless method of allowing communication between a teacher and student for land-based applications that does not encumber the student from performing their instructional training activities.

**SUMMARY OF THE INVENTION**

This invention satisfies the above needs. The apparatus of the present invention would provide a wireless communication system that would broadcast a coach’s voice to his/her players. As a result, the coach would not have to raise his/her voice or yell to communicate to the players. Instead, all of the players would easily hear the coach’s instructions simultaneously despite any physical separation across a field of play or being in the presence of distracting ambient noise such as crowd noise or traffic. As a result, use of the system of the present invention makes it easier for a coach to relay instructions, strategies and philosophies to the players. The coach could also teach his/her players so that they learn their assignments and improve their technique. This would make practice sessions more productive so that the player’s learning curve is greatly improved, opening the door to better results as a team and as an individual.

The present invention would be suitable for a wide range of sports. For example, soccer, football, baseball, softball, lacrosse, ice hockey, and field hockey are all sports wherein the players can be physically separated at a great distance from the coach, thus making communication between a coach and the players
difficult. By using the system of the present invention, a coach could now communicate without yelling. Players would benefit from being able to hear the coach’s instruction clearly and simultaneously. The players would enjoy improving individually and as a team. As the players and the team improved, they may win more games and experience the thrill of winning, thus making the sport more enjoyable.

The system of the present invention is preferably comprised of a microphone and transmitter for the coach, and at least one receiver and speaker for at least one player. When the coach desires to talk to the players, he could simply activate the microphone and speak into it, which then transmits his voice to and is subsequently heard at the players’ headsets. The system of the present invention may be additionally comprised of elements such as: a receiver and speaker for the coach, at least one microphone and transmitter for at least one player, a battery or battery pack, a frequency selector or tuner, an amplifier, a scrambler or other means of secure transmission and receipt of a signal, antennae, a repeater, an on-off switch, a volume control, a noise filter, directional or noise canceling microphones, speakers, and other components typically associated with wireless communication devices known in the art such as indicator lights, digital readouts, LCD screens, and other electronic displays.

An exemplary coach’s microphone of the present invention may be a typical analog microphone as is known in the art. The microphone may include a clip-on attachment device. Alternatively, the microphone may suspended from a loop, headband, or headset so that it is proximate the coach’s mouth. Alternatively, the microphone can be integrated into a piece of apparel worn by the coach, such as a jacket, belt, vest, or hat. In addition, the microphone may be a bone conduction
microphone. The microphone may use a battery or battery pack. In addition, the microphone may be a directional microphone or use noise canceling technology to assist in the production of a clear sound to transmit to the players.

The transmitter of the present invention may be integrated with the microphone apparatus of the present invention. As described above, the apparatus may be worn on a loop, headband, or headset so that the microphone portion is proximate the coach's mouth. Alternatively, the transmitter may be separate from the microphone with the transmitter separately clipped or suspended on the person of the coach. Alternatively, there may be a wireless connection between the transmitter and the microphone. Typical means of wireless connections include, but are not limited to, radio frequency and infrared technology. The wireless connection between the transmitter and the microphone provides for either the attachment of the transmitter on the person of the coach or for a separate standalone transmitter. Either mode of wired or wireless communication between the microphone and the transmitter may use an antenna for transmission. An example embodiment of the present invention may integrate a transmission antenna with the wired connection between the microphone and the transmitter.

In addition, the transmitter of the present invention may be voice-activated (VOX). Alternatively, the transmitter of the present invention may have a separate activation device, such as a button that is depressed for a push-to-talk (PTT) mode. Additionally, the transmitter may have an amplifier that boosts the signal sent to the receivers of the players. The transmitter may have a frequency selector or tuner that permits the setting of a broadcast frequency to match the receivers of the players, thereby allowing competing teams to use different frequencies that allow uninterrupted communication for each team on the same field of play. In addition,
the transmitter of the present invention may use a typical scrambling technology as is know in the art to permit secure communications between the coach and his players. The transmitter may use a battery or a battery pack.

The transmitter and the receiver of the present invention preferably operate on any of the bands of wireless communication known in the art. For example, the system of the present invention may operate on a radio frequency such as FM, AM, citizen’s band, or family radio frequencies. Alternatively, the system of the present invention may operate on a specially licensed or designated radio frequency. In addition, the system of the present invention may use cellular phone technology. Alternatively, the system of the present invention may use digital transmission, optical transmission, infrared transmission, or repeaters to provide communication between the transmitter and the receivers.

An example receiver of the present invention is preferably compatible with any of the various embodiments of the transmitter as described above. For example, the receiver may be comprised of a tuner to match the signal sent by the transmitter or a repeater. A preferred embodiment of the receiver is easily carried on a suspension, headband, loop, or sweatband that lessens its impact on the player-wearer and will be compatible with the activity of a player-wearer, especially with respect to sporting activities that require a great deal of mobility. Preferably, an embodiment of the receiver may be comfortably worn with a standard cap, helmet, uniform, or protective device worn by a player. Additionally, the receiver may be integrated into a cap, helmet, uniform, piece of apparel, or a protective device worn by a player. Any of the carriers for the receiver listed above may be additionally comprised of adjustable straps for a secure fit. A preferred embodiment of a receiver of the system of the present invention takes advantage of known
miniaturization technology using integrated circuits to provide a receiver for a player that is lightweight and compact. Preferably, the receiver would have low energy requirements such that an associated battery or battery pack may be minimally sized.

A receiver of the system of the present invention may also be comprised of a receiving antenna. Preferably, a receiving antenna would be integrated into or self-contained in the receiver itself. Preferably, the receiving antenna would allow the comfortable fit of a cap, helmet, uniform, or protective device that is worn with the receiver.

The system of the present invention preferably includes at least one speaker for at least one player. The speaker may have a hard-wired or wireless connection with a receiver and may be integrally-mounted within the receiver unit's body or separate from the receiver unit. As described above with respect to the transmitter-microphone connection, the receiver and speaker may similarly communicate via wireless technology known in the art such as infrared or radio frequency. In addition, the receiver of the present invention would preferably control the volume of sound at a connected speaker.

The speaker of the present invention may take the form of any type of speaker typically known in the art. The speaker may be of any form such as the ear pieces associated with portable electronic stereos, radios, CD players, and computerized music file players. The speaker may be a relatively flat apparatus additionally comprising a form fitting cover such as a foam or malleable plastic. Alternatively, the speaker may be formed like an ear bud or a more form-fitting earplug. Alternatively, the speaker may utilize miniaturization technology such as is associated with hearing aids to provide a speaker and receiver that is extremely
small and has low energy requirements. Depending upon a particular application of the system, the choice of a speaker may be influenced on the desired interface with a player's ear so that the ambient noise heard by a player is reduced or eliminated. In addition, a player may be provided with a pair of speakers rather than a single speaker. Preferably, the speaker used in an example embodiment of the system of the present invention is compact so that it can be worn with or integrated into a suspension, headband, loop, or sweatband. Preferably, a speaker may be comfortably worn with a standard cap, helmet, uniform, or protective device worn by a player. Alternatively, a speaker may be integrated into a cap, helmet, uniform, piece of apparel, or a protective device worn by a player.

In addition, an embodiment of the sports training system of the present invention may be additionally comprised of a receiver and speaker for the coach and at least one microphone and transmitter for at least one player. In this manner, the present invention can provide a system for two-way communication between a coach and his or her players. As described previously, the transmitter, receiver, microphone, and speaker may be similarly constructed.

In addition to the features mentioned above, objects and advantages of the present invention will be readily apparent upon a reading of the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

Novel features and advantages of the present invention, in addition to those mentioned above, will become apparent to those skilled in the art from a reading of the following detailed description in conjunction with the accompanying drawings wherein similar reference characters refer to similar parts and in which:
FIG. 1 illustrates an embodiment of the back view of a receiver unit of the present invention.

FIG. 2 illustrates an embodiment of the front view of a receiver unit of the present invention.

FIG. 3 illustrates an embodiment of a head-mounted receiver unit of a system of the present invention comprised of a receiver unit packaged within a strapped carrier unit.

FIG. 4 illustrates an embodiment of a head-mounted receiver unit of a system of the present invention mounted on a head.

FIG. 5 illustrates an embodiment of a head-mounted receiver unit of a system of the present invention comprised of a receiver unit packaged within a strapped carrier unit with external speaker mounted on a head.

FIG. 6 illustrates an embodiment of an armband receiver unit of the present invention comprised of a receiver unit packaged within an arm-mounted strapped carrier unit.

FIG. 7 illustrates an embodiment of an armband receiver unit of the present invention mounted on an arm.

FIG. 8 illustrates an embodiment of a back view transmitter unit of the present invention.

FIG. 9 illustrates an embodiment of a front view transmitter unit of the present invention.

FIG. 10 illustrates one embodiment of a coach's headset of the present invention.

FIG. 11 illustrates another embodiment of a coach's headset of the present invention.
FIG. 12 illustrates an embodiment of the rear view showing use of a coach’s transmitter unit with optional press-to-talk (PTT) wand of the present invention.

FIG. 13 illustrates an embodiment of the front view showing use of a coach’s transmitter unit with optional press-to-talk (PTT) wand of the present invention.

FIG. 14 illustrates an embodiment of a coach’s transmitter unit with optional press-to-talk (PTT) wand of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT(S)

The preferred system herein described is not intended to be exhaustive or to limit the invention to the precise forms disclosed. They are chosen and described to explain the principles of the invention, and the application of the method to practical uses, so that others skilled in the art may practice the invention.

With reference to Figures 1 and 2, the preferred embodiment of a player receiver 1 of the present invention is shown. The receiver is packaged using any compatible metal, plastic or composite material or combination thereof known in the art to minimize size and weight and is comprised of: an on/off volume control switch 3 which is used to turn the receiver on and off as well as control the sound volume emitted from an internal speaker 11, a channel selector 5 used to select a particular operating radio frequency (RF), an RF antenna 7, and an external speaker jack port 9, which allows use of an optional external speaker. An optional microphone may be embodied with the speaker at 11 if a two-way communications embodiment is desired wherein the receiver unit additionally comprises a transmitter making it a transceiver. A battery pack/compartment 13 allows either the use of prepackaged single-use or rechargeable custom battery packs or off-the-shelf commercially available batteries to provide electrical power to the unit. Either the battery
pack/batteries 13 or the receiver 1 may be readily exchanged with other similar battery packs or receivers. For example, a battery pack may be detached to replace discharged batteries or to charge the batteries in the battery pack. Receiver frequency selectivity via 5 allows a receiver to be removed and exchanged with another receiver intended to receive signals on a different frequency than the first receiver.

**Figures 3 and 4** illustrate a preferred embodiment of the receiver unit to be worn on the head of a student which is comprised of: a receiver unit 1, a receiver support pouch 27, and headband 21 with adjustable suspension strap 29. The example headband 21 and suspension strap 29 may be comprised of any material typically used for the construction of similar devices known in the art which include, but are not limited to, elastomers and plastics. Separate portions of the suspension strap 21 may be attached together so that one strap can be slidably inserted into a complementary sized fitting on another strap. In this manner, the size of the player's head may be comfortably mated to a particular setting of the suspension strap 21. This type of structure is well known in the art such as might be used for the suspension portion of a hardhat or safety helmet. As shown, the receiver 1 is attached to the headband 21 using a pouch 27 which allows easy receiver removal from and installation into the headband. Any other non-permanent attachment methods known in the art may be employed. For example, the receiver 1 may be attached to the headband 21 with a hook and loop type fastener such as VELCRO®. In this manner, the receiver 1 can be readily attached and detached from the headband 21.

In addition, the receiver 1 can be either permanently or releasably connected to an external speaker 23 shown in **Figure 5** via an electrical umbilical and
connector plug 25. The connector 25 plug mates with the receiver via the external speaker jack port 9. This external speaker 23 can be either permanently or releasably connected to the headband 21 proximal to the ear with, for example, hook and loop type fasteners or similar methods known in the art to enhance audibility to the user. In a two-way communications embodiment, the external speaker 23 would additionally incorporate a microphone to allow the student athlete to communicate with the transmitter portion of the transceiver.

Figures 6 and 7 illustrate another preferred embodiment of the invention as an armband alternatively worn on the arm of a player versus the head. In this embodiment the same components described for the head-mounted receiver configuration as shown in Figures 3 and 4 are employed which offers the user the option of wearing the invention on either the arm or head.

Figures 8 and 9 illustrate an embodiment of a coach's transmitter of a system of the present invention. Similar to the receiver, the transmitter is packaged using any compatible metal, plastic or composite material or combination thereof known in the art and is comprised of: an on/off volume control switch 10 which is used to turn the transmitter on and off as well as control the sound volume emitted from an optional internal speaker 14, a channel selector 6 used to select a particular operating radio frequency (RF), an RF antenna 8, and an external microphone jack port 12, which allows use of an external microphone. A battery pack/compartment 24 allows either the use of prepackaged custom battery packs or off-the-shelf commercially available batteries to provide electrical power to the unit. Either the battery pack/batteries 24 or the receiver 1 may be readily exchanged with other similar battery packs/batteries or receivers. For example, a battery pack may be detached to replace discharged batteries or to charge the batteries in the battery
pack. Receiver frequency selectivity via 6 allows a transmitter to be removed and exchanged with another transmitter intended to receive signals on a different frequency than the first transmitter. The transmitter embodies an optional belt clip 26 which allows the transmitter to be conveniently carried on a belt or similar article of clothing. The channel selector 6 allows the invention to operate on a non-interfering frequency when used proximal to other RF communication devices. A scrambler or other means of secure transmission and receipt of a signal known in the art may be employed to promote secure communications between the coach and student athlete.

Figures 10 and 11 illustrate a preferred embodiment of a coach's communication headset 16 which is comprised of: an optional set of earphones 18, a lightweight head-mounting support structure 20, and a boom supported microphone 22 used to place the microphone proximal to the coach's mouth. The earphones 18 may be used in an alternative two-way communications embodiment wherein a microphone and supporting transmitter is embodied within the receiver unit to allow the student athlete a method of communicating with the coach. Volume control of the earphones is controlled by the volume control switch 10 as shown in Figure 9.

Figures 12, 13 and 14 illustrate the preferred embodiment of this invention illustrating one exemplary use of the invention by an instructional coach. A communications umbilical 30 provides communication between the headset 16 and the transmitter 2 which is removably or permanently connected to the transmitter via an electrical plug/jack 32 connector that mates with port 12 on the transmitter. An optional push-to-talk (PTT) wand comprised of a PTT hand-held button 36 and a communications umbilical 34 may be optionally used in a push-to-talk (PTT) mode
vice the voice-activated (VOX) mode in order to activate the transmitter 2 and send out voice communications to the player's receivers. The PTT wand is either removably or permanently connected to the transmitter via plug/jack 32 and would not be needed if the VOX mode of operation is desired. Alternatively, there may be a wireless connection between the transmitter and the microphone using infrared, RF or other methods of wireless communication known in the art.

Having shown and described a preferred embodiment of the invention, those skilled in the art will realize that many variations and modifications may be made to affect the described invention and still be within the scope of the claimed invention. Thus, many of the elements indicated above may be altered or replaced by different elements which will provide the same result and fall within the spirit of the claimed invention. It is the intention, therefore, to limit the invention only as indicated by the scope of the claims.
I claim:

1. A sports training system comprising:

   a microphone;

   a transmitter in communication with said microphone;

   at least one receiver adapted to receive a signal from said transmitter;

   and

   at least one speaker in communication with said receiver.

2. A sports training system of Claim 1 further comprising a transmitter and receiver packaged using any compatible metal, plastic or composite material or combination thereof known in the art.

3. A sports training system of Claim 1 wherein either one-way or two-way modes of communication are embodied.

4. A sports training system of Claim 1 wherein the power is provided via a single or plurality of electric storage batteries.

5. A sports training system of Claim 4 wherein said batteries are rechargeable.

6. A sports training system of Claim 4 wherein said batteries are installed into the said transmitter or receiver separately via a battery pack.

7. A sports training system of Claim 4 wherein said batteries are interchangeably used between transmitters, receivers, and any combination thereof.

8. A sports training system of Claim 1 further comprising a method of selectively choosing communications channels for communication between the said transmitter and the said receiver.

9. A sports training system of Claim 1 wherein wireless communications between the said transmitter and the said receiver is conveyed via
analog or digital signal processing using radio, infrared, optical, or
repeater transmission methods.

10. A sports training system of Claim 1 wherein an on or off or volume control
feature is embodied within said transmitter or said receiver.

11. A sports training system of Claim 1 further comprising a built-in or external
antenna within said transmitter or said receiver.

12. A sports training system of Claim 1 wherein said transmitter embodies a
voice-activated (VOX) or a push-to-talk (PTT) switch allowing the
option to select either voice-activated (VOX) or push-to-talk (PTT)
transmission modes.

13. A sports training system of Claim 12 wherein said PTT switch is embodied
into a communications umbilical.

14. A sports training system of Claim 13 wherein said communications umbilical
is either hard-wired into said transmitter or removably attached via a
plug or a receptacle.

15. A sports training system of Claim 14 wherein a wireless communication
method is used between said PTT switch and said transmitter.

16. A sports training system of Claim 15 wherein said wireless communication is
conveyed via analog or digital signal processing using radio, infrared,
optical, or repeater transmission methods.

17. A sports training system of Claim 1 wherein said transmitter embodies a
directional, noise-canceling, or bone conduction microphone.

18. A sports training system of Claim 17 wherein a headset is embodied to
support a microphone and optional earphones.
19. A sports training system of Claim 17 wherein said microphone communicates
with said transmitter via a communications umbilical.

20. A sports training system of Claim 19 wherein said communications umbilical
is either hard-wired into said transmitter or removably attached via a
plug or a receptacle.

21. A sports training system of Claim 1 wherein a wireless communication
method is used between the said microphone and said transmitter.

22. A sports training system of Claim 21 wherein said wireless communication is
conveyed via analog or digital signal processing using radio, infrared,
optical, or repeater transmission methods.

23. A sports training system of Claim 1 wherein said receiver is carried by the
user via a head-mounted headband or strap.

24. A sports training system of Claim 23 wherein said headband or strap is
adjustable.

25. A sports training system of Claim 23 wherein said receiver is removably
attached via hook-and-loop fasteners.

26. A sports training system of Claim 1 wherein said receiver is carried by the
user via an arm-mounted armband or strap.

27. A sports training system of Claim 26 wherein said armband or strap is
adjustable.

28. A sports training system of Claim 26 wherein said receiver is removably
attached via hook-and-loop fasteners.

29. A sports training system of Claim 1 wherein said receiver embodies an
internal or an external speaker.
30. A sports training system of Claim 23 wherein said external speaker is either removably or permanently attached to said headband.

31. A sports training system of Claim 30 wherein said external speaker is removably attached via hook-and-loop fasteners.

32. A sports training system of Claim 29 wherein said external speaker communicates with said receiver via a communications umbilical.

33. A sports training system of Claim 32 wherein said communications umbilical is either hard-wired into said receiver or removably attached via a plug or receptacle.

34. A sports training system of Claim 29 wherein said external speaker communicates with said receiver via wireless methods.

35. A sports training system of Claim 34 wherein said wireless communication is conveyed via analog or digital signal processing using radio, infrared, optical, or repeater transmission methods.

36. A method of sports training, said method comprising:

issuing an audible coaching instruction into a microphone;

transmitting said audible coaching instruction;

receiving said audible coaching instruction;

hearing said audible coaching instruction from a speaker,

wherein the means of said transmitting and said receiving of said audible coaching instruction is wireless; and

wherein said audible coaching instruction is transformed into a format compatible with said wireless means of transmitting and receiving.

37. A sports training system of Claim 36 wherein either one-way or two-way modes of communication are embodied.