

IMPROVEMENTS TO A LIFE RECOVERY DEVICE AND A SYSTEM
THEREOF

FIELD OF THE INVENTION

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The present invention relates to a life recovery device and a system thereof. More particularly the present invention relates to an improve life recovery device and a system thereof. Most particularly the present invention relates to an improve device and a system to promote life recovery of victims
10 and the collections of data as to the circumstances and origin of an accident.

BACKGROUND OF THE INVENTION

There have been several life recovery devices available conventionally
15 in the market. Most of such said devices are normally utilized in the aerospace industry, maritime activities such as canoeing, yachting, deep sea fishing and the like activities.

In the aerospace industry, the most commonly used recovery device is
20 the black box. The black box is a device which is installed in a secure manner on an aircraft to enable accident investigators to review procedures and instructions moments before an accident occurs. This is to facilitate the accident investigators to identify the cause of said accident. However, said black box is only able to provide information relating to performance,

navigation and operation on an aircraft. The black box does not include any provision or does not promote any means to recover lives. The black box's capabilities is only limited to showcasing the origin or the cause of an accident.

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Other prior art devices will now be described in brief to facilitate the understanding of the problems persists in the prior art devices in relation of the present invention.

10 Firstly, reference is made to US Patent No. 5,940,004. This '004 patent discloses a personnel recovery system designed to provide a parent or other individual placed in a guarding position, with an effective system for monitoring the status and location of those people which they are responsible to care for. This system is basically a device to monitor a person and not
15 particularly designed for life recovery reasons.

Secondly, reference is made to another US patent, US Patent No. 6,201,476. This '476 Patent discloses a device for monitoring the activity of a person with a view in particular to summon help in the event of an accident
20 hazardous to life or limb. This device again monitors the activity of a person and it is design to send alarm signal informing a central centre of an accident but it does not provide any means to facilitate the recovery of said injured person such as providing vital health records or allergy and the like data.

Thirdly, reference is made to another US Patent, US Patent No. 5,045,839. This '839 Patent discloses a personnel activity sensor and alarm system which is provided with one or more remote personnel safety units each incorporating a multi-axis motion detector and reset timing and a logic
5 circuit coupled with a radio transmitter or transceiver. Under the command of the logic circuit, the radio automatically transmits an alarm signal and causes the circuitry to generate a local audio signal in the event of personnel inactivity for a pre-determined period of time. Again this patent teaches a manner of monitoring a personnel and then sending an alarm signal when no activity is
10 detected for a given time after a casualty. No means of life recovery is provided thereof.

Fourthly, reference is made to US Patent No. 6,100,806 which discloses an apparatus and a method of monitoring mobile objects or persons
15 by utilizing the Global Positioning Satellite (GPS) and cellular telephone communications. Said apparatus includes a first and second remote unit adapted to be worn on the monitored person or object. Aid remote unit would comprise the position and data sensors as well as the transmitter device to transmit the information back to a central tracking station. This patent again
20 discloses a means of monitoring a person or objects and hardly relates to a life recovery device. Another disadvantage of this invention is that the person has to carry a couple of complicated devices in order to transmit data.

Fifthly, reference is made to US Patent No. 5,853,005 which discloses a transducer with a fluid in a pad held in close contact against sound or movement source which monitors acoustic signals transferred into the fluid. The signal pattern is monitored aurally and/or compared to a pre-determined reference patterns, and optionally control and stimulation means can be activated in response to the comparison results. This patent again teaches a manner or monitoring activities in an individual by detecting sound and vibration. The disadvantage of this invention is that the fluid pad has to be in contact against sound of movement source otherwise this invention will not work properly. Another disadvantage is that the data transmitted is actually a comparison data and may not be an actual situation data. It would quite difficult to use said invention as a recovery device.

Lastly, reference is made to US Patent No. 5,652,570 which discloses an interactive individual location and monitoring system for maintaining health, location and other data with respect to an individual. A watch unit carried by the individual receives medical and other information selected by and inputted directly from the individual. The watch unit broadcasts the medical and other information locally b radio in a region near the individual. A belt worn pod unit is also worn by the individual, which includes a transponder for recovering the information from the watch unit. The pod unit then transmits the information to the central unit. The pod unit transmits the information to the central monitoring system. The pad unit tracks the location of the individual and transmits the location to the central monitoring system. This invention is again

design to track and monitor an individual. The disadvantage is that the user needs to wear a transmitter and a transponder in order for the invention to work. If any one of the transmitter or transponder is damaged, the user cannot be tracked. Another disadvantage is that the actual condition of the user
5 during casualty is not determinable as no such means is provided.

It is therefore clear that all the above mentioned prior arts are designed to monitor or locate an individual or object. There are no particular means to save lives during casualty or emergencies. All data collected and transmitted
10 by the prior art device are tabulated from its surrounding during a casualty or are compared with a pre stored database to determine the actual real time of the user. Said devices if damage will result in the data not being able to transmit or cannot be read.

15 Therefore, it is an objective of the present invention to overcome the above mentioned disadvantages by providing an improved recovery device and system. It is also another objective of the present invention to introduce a device and system which is not limited to determine the location of a user but it can also record actual situation of the user during a casualty or emergency
20 by means of a sound recorder or voice sensors describing in detail what the user is suffering from the accident. The present invention is also capable of recording final messages such as a good bye note or revising a will.

Any discussion of documents, devices, acts or knowledge in this specification is included to explain the context of the invention. It should not be taken as an admission that any of the material forms a part of the prior art base or the common general knowledge in the relevant art in Singapore or
5 elsewhere on or before the priority date of the disclosure and claims herein. All statements as to the date or representation as to the contents of these documents is based on the information available to the applicant and does not constitute any admission as to the correctness of the dates or contents of these documents.

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SUMMARY OF THE INVENTION

The present invention relates to an improvement to a life recovery device to search and rescue individual or objects. The improvements
15 comprises of a housing member, an integrated main circuit board onto which a plurality of components are integrally mounted therein. The said components are selected from a Global Positioning System (GPS) device, at least one memory means, at least one sensor, at least one removable power supply means, a central processing unit (CPU), at least one sound recording
20 means, a plurality of input/output interfaces (I/O) and at least one permanent power supply means. All the above mentioned components are integrally connected with each other by a plurality of circuit means and wherein said housing member is then provided to a user.

The housing member of the present invention is made of robust material selected from a group of composite material. The composite material is further selected from titanium, aluminum, plastics and the like material. The memory means is preferably designed to store data in audio and video
5 formats. The sensor is selected from a group of sensors such as a water sensor, heat sensor, vibration sensor, movement sensor or the like sensors available therein. The sound recording means is an integrated microphone or an externally connected microphone. Optionally, an image recording means could also be incorporated in to the present invention to record video images.
10 The removable power supply means and the permanent power supply means of the present invention is either selected form a battery and/or other power source means such as solar power and etc.

A system for tracking and rescuing an individual by utilizing
15 improvements to a life recovery device to search and rescue individual or objects as above comprises of a housing member, an integrated main circuit board onto which a plurality of components are integrally mounted therein. The said components are selected from a Global Positioning System (GPS) device, at least one memory means, at least one sensor, at least one
20 removable power supply means, a central processing unit (CPU), at least one sound recording means, a plurality of input/output interfaces (I/O) and at least one permanent power supply means. All the above mentioned components are integrally connected with each other by a plurality of circuit means and wherein said housing member is then provided to a user.

According to the present invention, the particulars of a user such as identification, health records and the like information is stored in the memory means via the I/O interfaces and at the same time a copy is transmitted to a database and stored therein. During time of emergency or casualty, at least one sensor will be activated and this will result in the CPU to be activated concurrently. A distress signal would be sent by the GPS device to a satellite and wherein said distress signal will be then transmitted to a ground receiving satellite. When the sensor is activated, the sound recording and/or the image recording means is also activated to record any voice or video message or distress. According to the present invention, optionally the recorded voice message which is stored in the memory means maybe transmitted together with the distress signal to the satellite.

The signal from the ground satellite is sent to a centre for processing said signal and after processing the distress signal, an alert warning is sent to the search and rescue team which may include the location of the signal and the condition of the user sending the signal. When a rescue team locates the user who send the signal, all data relating to the user is retrieved from the memory means by connecting it to a portable reader via the I/O interface and thereafter sending a signal back to the centre that the user who sent the signal has been located and is being rescue and at the same time reporting the actual condition of the user. A further extension to the system would be

interconnecting a medical centre directly with the rescue team or the centre so that the medical centre could prepare itself before the victims arrives there.

Further scope of applicability of the present invention will become
5 apparent from the detailed description given hereinafter. However, it should
be understood that the detailed description and specific examples, while
indicating preferred embodiments of the invention, are given by way of
illustration only, since various changes and modifications within the spirit and
scope of the invention will become apparent to those skilled in the art from
10 this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

Further disclosure, objects, advantages and aspects of the present
15 application may be better understood by those skilled in the relevant art by
reference to the following description of preferred embodiments taken in
conjunction with the accompanying drawings, which are given by way of
illustration only, and thus are not limitative of the present invention, and in
which:

20 Figure 1 shows a simplified circuit layout design of the present
invention;

Figure 2 shows a block diagram of the present invention in process and
the system involved in rescuing a victim; and

Figure 3 shows a simplified circuit layout design as shown in Figure 1 but optionally with an image recording means and a solar panel.

DETAILED DESCRIPTIO OF THE INVENTION

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The present invention comprises of a housing member (10) (not illustrated) which held therein a main circuit board (12). The main circuit board (12) is further provided with a Global Positioning System (GPS) device (14), a memory means (16), sensor (18), a removable power supply means (20), a
10 central processing unit (CPU) (22), a sound recording means (24), an input/output interface (I/O) (26) and a permanent power supply means (28). All the above mentioned components are integrally built onto the main circuit board (12). A simplified circuit layout design of the present invention is shown in Figure 1. In the present embodiment, all the above mentioned components
15 are integrally mounted onto the main circuit board (12) by conventional means and therefore the manner of mounting will not be described in detail.

The I/O interface (26) is provided thereto to facilitate data to be transmitted and stored in the memory means (16). The said I/O interface (26)
20 is generally a connecting means and is selected from a group of known connectors such as Universal Serial Bus (USB), FireWire IEEE 1394, Infra Red, Bluetooth and the like connectors. Examples of data that would be transmitted via the said I/O interface (26) and stored in the memory means (16) are personal information of a particular individual such as the person

carrying the present invention, medical history such as allergies, health condition and the like and other important data. It is to be noted that all data stored in the memory means (16) is in a solid state. The memory means (16) has been configured to automatically transmit the data stored in the memory means (16) onto a remote database. The reason of doing so is to prevent any loss of data from the present invention in a freak accident in which the main circuit board (12) is damaged. By doing so, even if the main circuit board (12) is damaged and data stored therein is not accessible, the information relating to the user wearing the present invention can still be accessible remote from the remote database.

The CPU (22) of the present invention is the control means which controls all activities in the said main circuit board (12). Further detail of how said CPU (22) operates will be described later in the specification.

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The sensor (18) of the present invention is a conventional sensor. Even though it appears to be only one sensor (18) provided in the present invention, it would be appreciated that a plurality of sensors could be integrated onto the main circuit board (12) to perform multiple and different tasks. Such examples of sensors that could be incorporated are water sensor, vibration sensor, heat sensor, heart beat sensor, accelerator sensor, acoustic sensor and etc. Said sensors would either be provided as a group or in a single manner.

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The sound recording means (24) of the present invention is a conventional microphone. The removable power supply means (20) and the permanent power supply means (28) are provided to introduce electrical supply to operate the present invention and a battery is used for this purpose.

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All the above mentioned components as described earlier are held in a housing member (10). Said housing member (10) is preferably made of composite material such as titanium, aluminum, plastics or the like materials. The purpose of selecting such materials is because of their properties to allow
10 the housing member (10) to be water proof, fire proof, shock proof and crash proof.

Now the working mechanism of the present invention will be described in detail. For the purpose of describing the present invention and the manner
15 the system to detect and recover life are conducted, one particular situation will be adopted herein. In that case, one particular sensor (18) would be selected from a group of sensor as described earlier, herein a water sensor.

Reference is now made to Figure 2, which shows a block diagram of a
20 rescue cycle in case of a maritime casualty, such as an aircraft crashed into the sea or a ship damage in deep sea. Each passenger of said aircraft or ship will carry the present invention in a compact mode. All data regarding the passenger as mentioned earlier will be inputted into the memory means (16) before providing the same to the passenger. Data regarding the passenger

can be inputted into the present invention when the passenger checks in his/her luggage and certifies his/her traveling or identification documents. The system can be integrated to other database such as the health institution, the registration institution and the like. All information stored in the present
5 invention will then be automatically transmitted to the remote database.

During a casualty at sea, when the present invention comes in contact with water, the water sensor (18) will be triggered and this will activate the CPU (22). Once the CPU (22) is activated, the sound recording means (24)
10 will also be activated. At the same time, a distress signal will be transmitted by the GPS device (14) to the satellite. The sound recording means (24) will record all voice distress of the victim and store the same in the memory means (16) in audio formats such as WAV, MPEG-1 audio layer or MP2, Windows Media Player or WMA and the like formats. When the satellite
15 detects a signal, it would then transmit said signal to a land receiving satellite. Then the signal is processed and the location of the signal is tracked by determining the precise location in X, Y and Z axis by means of the GPS device (14). Then an alert signal is transmitted to a search and rescue centre, hereinafter referred as SAR with precise information for search and rescue
20 purpose. The present invention may also be configured to transmit voice recorded earlier via satellite to determine the condition of the victims. Search and rescue team will at all time be updated of the location of the signal and the condition of the victims so that they could organize their search and rescue mission swift and effective.

The present invention is designed to transmit signal of all the passengers whether they are still alive or already dead. Therefore, the present invention will be able to assist the rescue team to locate all passengers. The voice signal from a passenger will also assists the rescue team to decide which victim required immediate medical attention first so that death casualty could be avoided. Once the rescue team has located a victim, the present invention is coupled to a hand held device such as a Personal Digital Assistant (PDA) of a rescue personal and all important data relating to that victim is transmitted to the PDA. This will allow the rescue team to provide the right medical assistant to the victim. At the same time the rescue team would be able to determine the identity of the victim and at the same time would be able to transmit data back to their centre informing them that the victim has been rescued and reporting the actual condition of the victim.

The purpose of sending a report to the centre would be solely to confirm that all passengers are located according to the stored number in the remote database. Therefore, a continuous communication between the rescue team, the victim and the centre is vital. The present invention is provided with two power source supply in order to ensure that there is sufficient power to operate the present invention for a sufficient period of time. Finally, the rescued victims would be sent to the nearest medical centre for further care. Information can also be send to the medical centre of the arrival of a victim and the condition of the said victim so that the right attention could be arranged thereof.

In another embodiment, the above mentioned configuration can be further added with other earlier mentioned sensors such as heat, vibration and etc sensors. By this means, the present invention will also be activated if the sensor (18) is activated by fire or shock or even freak movements. The system of rescuing and search will be still the same as mentioned above. The present invention is quite efficient when come to diagnosing the cost of an accident. This is because the sound recording means (24) will actually tell the investigators the cause of an accident. It is possible sometimes that a serious accident may cause the death of a person and at this precious moment the active device will be able to record any last words of the user to his family or other parties.

In another embodiment as shown in Figure 3, an optional provided image recording means (30) could be incorporated therein. Said image recording means (30) would be operable concurrently when the CPU (22) is activated and may be configured to transmit images to the satellite likewise described earlier. Also shown in Figure 3 is an optionally incorporated solar panel (32) as a back up power source in case of unforeseen circumstances.

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Another advantage of the present invention is that in case of a circumstance in which an accident has resulted in the data stored in the memory means (16) not readable by a rescue team. Then in such case, each of the present invention is provided with a serial number engraved on the

housing body (10). The rescue team will then communicate with the remote database where a copy of the victim's data has been stored and numbered with the same serial number. An authorized personal at the remote database will access the information of the victim and then will transmit the same to the
5 rescue team.

In the present invention, the rescue team is not restricted in using a PDA when retrieving data from the memory means (16) during an emergency. They can also use other type of means such as a notebook and etc to retrieve
10 data. When a distress signal is received by the SAR, there nearest SAR within the zone of the accident will be alerted. However, other SAR in other zones will also be alerted of the accident. This will provide further rescue team to assists rescue team from other zones.

15 The present invention can be configured and designed to be a stand alone device which a user can carry with them at all time or it could be integrated into a working suit, life vest, life boat, belt, watch, necklace or practically anything which a user may carry easily with them at anytime.

20 Further improvements to the present invention may be such as improving the choice of GPS technology used. A technological advance GPS may cost more than a conventional GPS device. The user may decide to what type of GPS is required depending on his/her requirement and affordability.

Further improvements to the present invention may be such as minimizing the weight and size of the device so that it is as light and compact as possible. It would be appreciated that over the years said device could be shrunk to smaller size with the advancement of technology.

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While this invention has been described in connection with specific embodiments thereof, it will be understood that it is capable of further modification(s). This application is intended to cover any variations uses or adaptations of the invention following in general, the principles of the invention and including such departures from the present disclosure as come within
10 known or customary practice within the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth.

As the present invention may be embodied in several forms without
15 departing from the spirit of the essential characteristics of the invention, it should be understood that the above described embodiments are not to limit the present invention unless otherwise specified, but rather should be construed broadly within the spirit and scope of the invention as defined in the appended claims. Various modifications and equivalent arrangements are
20 intended to be included within the spirit and scope of the invention and appended claims. Therefore, the specific embodiments are to be understood to be illustrative of the many ways in which the principles of the present invention may be practiced. In the following claims, means-plus-function clauses are intended to cover structures as performing the defined function

and not only structural equivalents, but also equivalent structures. For example, although a nail and a screw may not be structural equivalents in that a nail employs a cylindrical surface to secure wooden parts together, whereas a screw employs a helical surface to secure wooden parts together, in the
5 environment of fastening wooden parts, a nail and a screw are equivalent structures.

“Comprises/comprising” when used in this specification is taken to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features,
10 integers, steps, components or groups thereof.”

CLAIMS

1. An improvement to a life recovery device to search and rescue individual or objects characterized in that the improvements comprises of a
5 housing member (10), an integrated main circuit board (12) onto which a plurality of components are integrally mounted therein and which is selected from a Global Positioning System (GPS) device (14), at least one memory means (16), at least one sensor (18), at least one removable power supply means (20), a central processing unit (CPU) (22), at least one sound
10 recording means (24), a plurality of input/output interfaces (I/O) (26) and at least one permanent power supply means (28), and optionally an image recording means (30) and wherein all the above mentioned components are integrally connected with each other by a plurality of circuit means and wherein said housing member (10) is then provided to a user.
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2. An improvement as claimed in Claim 1 wherein the housing member (10) is made of robust material selected from a group of composite material.
3. An improvement as claimed in Claim 2 wherein the composite material
20 is further selected from titanium, aluminum, plastics and the like material.
4. An improvement as claimed in Claim 1 wherein the memory means (16) is preferably designed to store data in audio and video formats.

5. An improvement as claimed in Claim 1 wherein the sensor (18) is selected from a group of sensors such as a water sensor, heat sensor, vibration sensor, movement sensor or the like sensors available therein.
- 5 6. An improvement as claimed in Claim 1 wherein the sound recording means (24) is an integrated microphone or an externally connected microphone.
7. An improvement as claimed in Claim 1 wherein the removable power
10 supply means (20) and the permanent power supply means (24) is selected from a battery and/or other power supply means such as solar power and etc.
8. A system for tracking and rescuing an individual by utilizing improvements to a life recovery device to search and rescue individual or
15 objects as claimed in the preceding claims characterized in that the system comprises of a housing member (10), an integrated main circuit board (12) onto which a plurality of components are integrally mounted therein and which is selected from a Global Positioning System (GPS) device (14), at least one memory means (16), at least one sensor (18), at least one removable power
20 supply means (20), a central processing unit (CPU) (22), at least one sound recording means (24), a plurality of input/output interfaces (I/O) (26) and at least one permanent power supply means (28), and optionally an image recording means (30) and wherein all the above mentioned components are

integrally connected with each other by a plurality of circuit means and wherein said housing member (10) is then provided to a user.

9. A system as claimed in Claim 8 wherein the particulars of a user such
5 as identification, health records and the like information is stored in the memory means (16) via the I/O interfaces (26) and at the same time a copy is transmitted to a database and stored therein.

10. A system as claimed in Claim 8 wherein during time of emergency or
10 casualty, at least one sensor (18) will be activated and this will result in the CPU to be activated concurrently.

11. A system as claimed in Claim 8 wherein a distress signal would be sent
by the GPS device (14) to a satellite and wherein said distress signal will be
15 then transmitted to a ground receiving satellite.

12. A system as claimed in Claim 8 wherein when the sensor (18) is activated, the sound recording means (24) is also activated to record any voice message or distress.

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13. A system as claimed in Claim 8 wherein optionally the recorded voice message which is stored in the memory means (16) maybe transmitted together with the distress signal to the satellite.

14. A system as claimed in Claim 8 wherein the signal from the ground satellite is send to a centre for processing said signal and after processing the distress signal, an alert warning is sent to the search and rescue team which may include the location of the signal and the condition of the user sending
5 the signal.

15. A system as claimed in Claim 8 wherein when a rescue team locates the user who send the signal, all data relating to the user is retrieved from the memory means (16) by connecting it to a portable reader via the I/O interface
10 (26) and thereafter sending a signal back to the centre that the user who sent the signal has been located and is being rescue and at the same time reporting the actual condition of the user.

16. A system as claimed in Claim 8 wherein further extension to the
15 system would be interconnecting a medical centre directly with the rescue team or the centre so that the medical centre could prepare itself before the victims arrives there.

17. A system as claimed in Claim 8 wherein all action conducted in the
20 housing member (10) is controlled and processed by the CPU (22).

18. A system as claimed in Claims 8 to 17 wherein the housing member (10) is made of robust material selected from a group of composite material.

19. A system as claimed in Claims 8 to 17 wherein the composite material is further selected from titanium, aluminum, plastics and the like material.

20. A system as claimed in Claims 8 to 17 wherein the memory means (16)
5 is preferably designed to store data in audio and video formats.

21. A system as claimed in Claims 8 to 17 wherein the sensor (18) is selected from a group of sensors such as a water sensor, heat sensor, vibration sensor, movement sensor or the like sensors available therein.

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22. A system as claimed in Claims 8 to 17 wherein the sound recording means (24) is an integrated microphone or an externally connected microphone.

15 23. A system as claimed in Claims 8 to 17 wherein the removable power supply means (20) and the permanent power supply means (24) is selected from a battery and/or other power supply means such as solar power and etc.