SOSOL (Security Of Soldiers)

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Abstract- *Basic guidelines for the preparation of a technical work for an IEEE protection for soldiers when they face any emergency situations. This can be done with the help of strap that soldiers wear during battle. In the strap, GPS Tracker with SOS and biosensors are affixed and inbuilt. LORA technology is used in our idea. Biosensors are connected to the LORA transmitter and to the microcontroller. So, that LORA transmitter transmits data over long distance. The transmitted data are received by LORA receiver. And the device can be protected from fire and water by placing it inside a stainless steel. The GPS Tracker is used to detect the location of missing soldiers and helps in rescuing them. The biosensors help to detect the body parameters of the soldiers. SOS is used in case of any emergency of soldiers. For long term working of these devices, Lithium sulphur battery is used.*

I. INTRODUCTION

Nowadays,The major problem faced in military is insecurity of soldiers. Our idea is to protectsoldiers from any emergency situations. This can be done by fixing a GPS tracker with SOS and biosensors in their strap. Thus, GPS tracker helps us to find their location and SOS helps to send alert message in case of any emergency of soldiers and biosensors helps to know about their conditions of body parameters. The device is made up of stainless steel which resists both fire and water. GPS (global positioning system) is satellite based radio navigation system. Altitude is of 20,000 km from earth. Earth is surrounded with 24 satellites and 6 orbits and 4 satellites in each orbit. The angle difference b/w each orbit is 55deg. There will an atomic clock in each

Satellites. Itsaccuracy will be at nanoseconds. The time of Atomic clock and GPS receiver gets synchronized. At periodic intervals GPS satellite sends accurate location and accurate time which GPS receiver receives. There will be some delay from satellite to receiver. **D=s*t, D=c*t** where **c=300000 km/sec**. trilateration concept is used.Speed of **sat=39km/sec,altitude=20000 km**. **Special relativity=7 ms/day slower. General relativity = 45ms/day faster**. So, **atomic clock=38 ms** faster. So, while launching satellite we have to set **38 ms** slower for atomic clock when compared to ground time. So, that when it reaches space atomic clock automatically runs exactly as when comp to ground time. Without considering this GPS cannot works. At, sometimes G**PS** may fail or the signal may be weak so in that case weuse**AGPS (ASSISTED GLOBAL POSITIONING SYSTEM). It** gets connected totheir tower network and gets connected to the satellite. Biosensors are used to measure the body parameters like respiratory rate, heart rate, body temperature, etc.

A) GPS:

The GPS is used for identifying the soldiers from an emergency situations. **AGPS** is used in case of failure of **GPS**due to any weather.

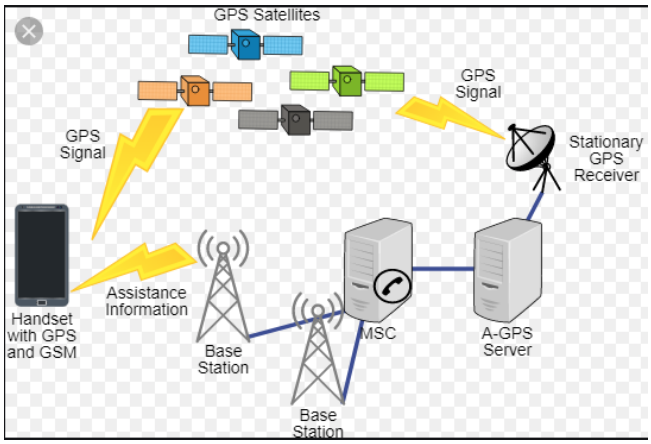

Fig.1.1

B) SOS:

Fig.1.2

- Preparation before operating GF07 mini GPS tracker A mini memory card and a SIM card.

- The SIM card frequency band GSM 850/900/1800/1900MHZ.
- If you don't know which carrier supports GF07.
- Only check the Country-based mobile phone network frequency coverage

C) VITAL MONITORING SYSTEM:

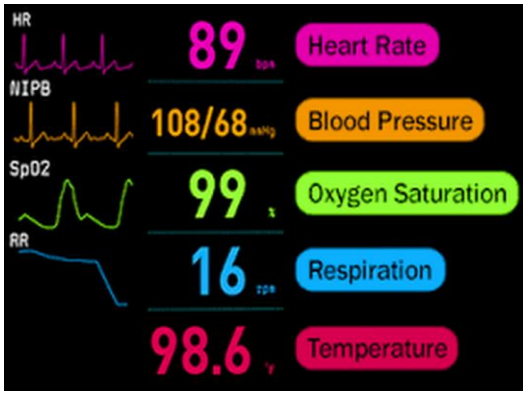

Fig.1.3

- Vital signs are used to detect or measure body parameters.
- It helps to measure the body temperature, heart rate, respiratory rate,blood pressure, oxygen level.

D) RADAR:

Fig.1.4

- A **radar** system uses a radiofrequency electromagnetic **signal** reflected from a target to determine information about that target.
- The soldiers used to communicatewith the help of RADAR.
- RADAR signal is represented as graph.

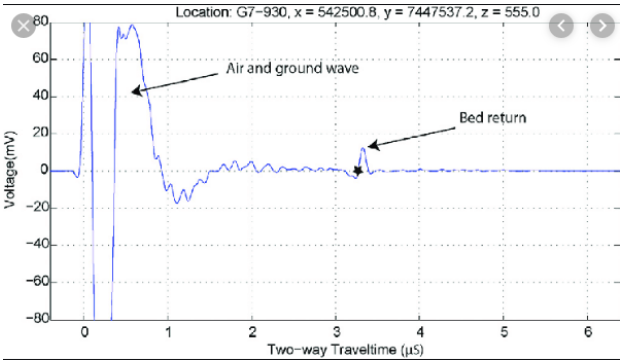

Fig .1.5

E) LITHIUM SULPHUR:

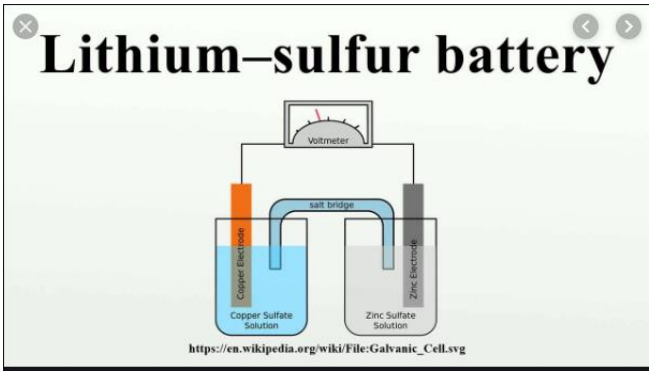

Fig.1.6

- LITHIUM SULPHUR is used there for **high durability** of storage of charge.
- It is more efficient than any other batteries.

F) LORA (LONG-RANGE)

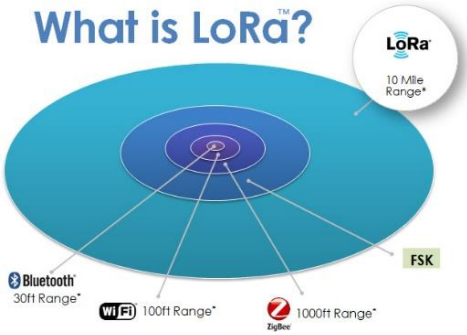

Fig.1.7

- **LoRa**means long range.
- It is used in case of long range transmission.
- It works based on **CSS (chirp spread technology).**
- LoRa devices and wireless radio frequency technology is a long range, low power wireless platform that has become the de facto technology for Internet of Things (IoT) networks worldwide.

- It can transfer data over 800 km.
- KEY FEATURES OF LoRa:

1) **Long range.**
2) **Low power.**
3) **Low cost.**
4) **Secure.**

LET US SEE HOW LoRa WORKS HERE?

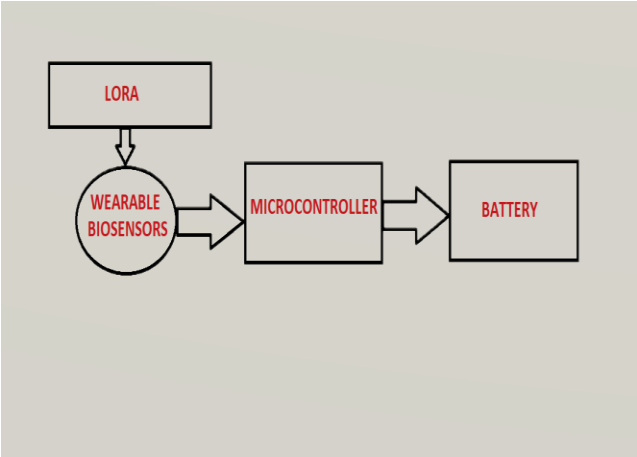

Fig.1.8

- As in the above block diagram LoRa is used in our project.
- LoRa transmitter sends the data (vital sign body parameters) measured by biosensor.
- And, it will be received by using LoRa receiver.

II. CONCLUSION

Here I conclude by protecting soldiers from any emergency situations. This can be done by fixing a GPS tracker with SOS and biosensors in their strap. Thus, GPS tracker helps us to find their location and SOS helps to send alert message in case of any emergency of soldiers and biosensors helps to know about their conditions of body parameters. The device is made up of stainless steel which resists both fire and water.

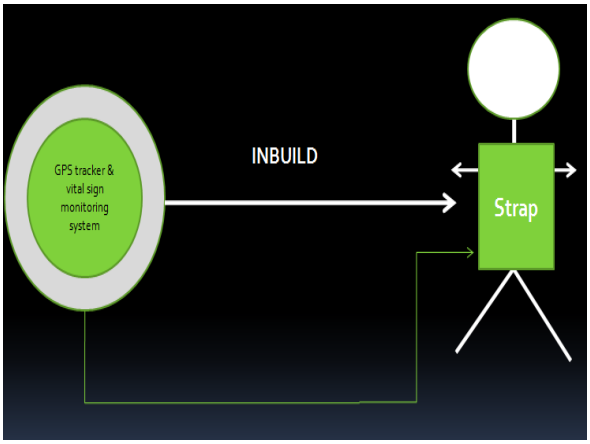

Fig.1.9

III. ACKNOWLEDGEMENT

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