SOLDIER TRACKING AND INFORMATION GATHERING SYSTEM USING WIRELESS TECHNOLOGY

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***Abstract*:** *In this day's international, enemy conflict is a crucial aspect in any nation's protection. One of the crucial and essential roles is played through the navy soldiers. There are numerous worries concerning the protection of squad dies. So for his or her safety cause, many units are established on them to view their fitness repute in addition to ammunitions gift with them. Bio-sensor structures include diverse varieties of small physiological sensors, transmission modules and processing competencies, and may for that reason facilitate low-fee wearable unobtrusive answers for health monitoring. GPS used to log the longitude and latitude so that path may be regarded easily. those gadgets are being added to weapons and firearms, and some militaries which include the Israeli navy which might be exploring the opportunity of embedding. GPS devices into infantrymen vests and uniforms in order that subject commanders can track their soldier's movements in actual time.GSM module may be used for wireless communications to be able to be required to relay statistics on situational consciousness, tactical instructions, and covert surveillance related facts during special operations reconnaissance and different missions. So with the aid of using this equipment's we're seeking to enforce the simple existence- guarding gadget for soldier in low fee and high reliability, additionally it's been deliberate to incorporate the Explosive scanner. If soldier is in subconscious state the audio visible signals are generated inside the soldier's wearable substances, the strength recharge to the operation of the gadget is furnished by the wearable sun panel and piezoelectric transducers in the shoes.*

Key Words: **Tracking, GPS, GSM, Biomedical Sensors, Navigation, Piezo Electric Transducers.**

1. INTRODUCTION

The kingdom's safety is monitored by means of navy. Military suffers lots because of unavailability of data of injuries to its employees of which might also boom the loss of life/disaster toll. As quickly as any soldier enters the enemy traces its miles very crucial for the military base station to understand the location as well as the fitness repute of all infantrymen. In our task we have provide you with an concept of tracking the soldier as well as to give the health reputation of the soldier at some stage in the battle, which permits the navy personnel to devise the struggle strategies. With the aid of the use of the vicinity sent by means of the GPS modem, the base station can understand the placement of soldier. [2]

The primary aspect of this technology will be the capability to offer data superiority at the operational edge of army networks by means of equipping the dismounted soldier with superior visual, voice, and facts communications. Helmet hooked up mask, capable of displaying maps and real-time video from other squad individuals, ranges of physiological sensors tracking heart rate, core frame temperature. [9]

The challenge become to combine those gradual components right into a lightweight bundle that might gain the preferred result without being too cumbersome and cumbersome or requiring too much electricity. One of the fundamental demanding situations in navy operations lies that the infantrymen are not capable of speak with manipulate room station. Further, the proper navigation among soldier's corporations performs crucial role for cautious making plans and co-ordination. So on this we awareness on tracking the area of soldier from GPS, that is useful for manage room station to recognize the exact place of soldier and accordingly they may guide them. Additionally excessive pace, soldier-to-soldier Wi-Fi communications to relay data on situational focus, GPS navigation, Bio-clinical sensors, wireless communication. [8]

2. RELATED WORK

Thanga Dharsni, Hanifa Zakir and Pradeep Naik [1] proposed Soldier Security and Health Monitoring. In which, gives framework for the soldier security and fitness tracking that may be hooked up at the warrior's body to track their well-being reputation and contemporary area by way of using GPS. This information could be transmitted to the control room via distributed computing. This proposed framework includes a few wearable physiological equipment's, sensors, transmission modules.

Surbhi Sharma, Sudhakar Kumar and Ankita Keshari [3] proposed A Real Time Autonomous Soldier Health Monitoring and Reporting System using Cots Available Entities which shows a qualitative approach to render an aid to the defense offerings by using making sure the protection, where about and dignity of army employees. The proposed system allows to hit upon the pulse and function of the military personnel on every occasion required, as a result vouching that well timed help is furnished to the needy soldier. The transmitter ready with pulse sensor and GPS module is programmed with sure conditions to observe the future health of the soldier and thus speak with the receiver at some faraway region.

Gopabandhu Hota and Sudharshan Sharma [4] An Integrated Visual Signaling, Localization and Health Monitoring for Soldier Assistance which describes the systems include gesture recognition based totally visual signaling; an extremely wide Band (UWB) based indoor and brief-variety outdoor localization and physiological parameter tracking modules. The modules mixed collectively help in developing a community which is used to tune fellow soldier's vicinity and alert messages based on the gesture and fitness parameters. The gesture reputation module consists of a glove built of flex and IMU sensors; the health tracking devices include of ECG, Temperature and PPG; and the UWB based totally verbal exchange is liable for alert messaging and indoor localization.

Zeeshan Raza, Shahzard Ashraf and Kamran Liaquit [5] proposed Monitoring of Soldiers and Transmission of Secret Codes wherein device would be carried with the aid of soldier in war. The device will be capable of feel heart beat and frame temperature of soldier and transmit the studying on base station in which the cumulative records will be displayed. A small database is prepared for garage of readings. Solder can also have sent a mystery massage on base station. on the way to make the studying accurate and specific a system is designed that is a correlation of frame temperature and heartbeat.

Muhammad Arsalan, Asghar Ashraf Musani and Syed Asad Ailia [6] proposed Military Uniform for Health Analytics for Field Intelligent. in which tool used to monitor and song each character in real-time in order that it may be concluded from the collected facts as which man or woman requires immediately clinical assist and which one performs fairly properly that can be taken into consideration a favored candidate for the up-coming precise missions. In this paper, present the machine of an embedded next technology tactical in shape designed for tracking fitness records/analytics of armed employees.

3. PROPOSED METHODOLY

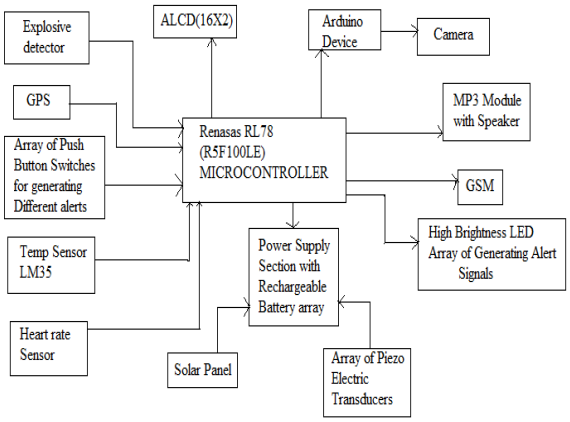
On this proposed work, there are gadgets -soldier unit and base station. In soldier unit, RL-78[R5F100LE] Microcontroller will play the principal role as a controller of all the devices. It receives the alerts from GPS receiver unit, &outputs the respective results on the liquid crystal display Module. It will monitor the coronary heart beat and if it goes low it'll ship the SMS of the area to the base station. MP3 module is used to generate the Audio indicators within the American accessory to play the desired Audio Templates. The sun panel and Piezo -electric transducers placed at the footwear of soldier might be used to generate the specified power for the operation of the machine. LM 35 that is a temperature sensor senses the frame temperature of the infantrymen.

An IC LM358 might be use to feel the heartbeat of the soldiers. The GSM unit sends the SMS to the navy base camp containing the fitness parameters and the place of soldier. An Alphanumeric liquid crystal display show is used to display the data sensed from BSNs and coming from the GPS modem .GPS module to discover self-location of hooked up area, it offers longitude &latitude above the sea level.

GPS antenna has to be connected to this receiver and itself exposed to sky floor to acquire the GPS

information. The software inside the ANDROID mobile Smartphone will read the GPS facts after which will show the region on the map. Depending at the heart records the ANDROID cellular phone will decide if he is dead or alive.

Soldier unit



Base Station unit

Android Phone for Producing Google Map along With the Soldiers alerts

Fig- 1: Block Diagram of proposed work

4. EQUIPMENTS

A. HARDWARE USED

1. RL-78 MICROCONTROLLER

Fig-2: Microcontroller- Renasas RL-78(R5F100LE)

RL78 microcontrollers greatly improve power efficiency with industry-leading low power consumption at 45.5 µA/MHz consumption during normal operation and 0.57 µA/MHz during clock operation. Built-in features such as a high-precision (±1%) high-speed on-chip oscillator, background operation data flash capable of 1 million rewrites, temperature sensor, and interface ports for multiple power supplies help reduce system costs and size.

2. MP3 MODULE

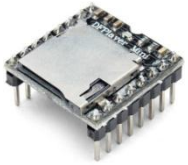


Fig- 3:MP3 Module

MPEG compression system includes a subsystem to compress sound, called MPEG Audio Layer-3. We know it by its abbreviation, MP3. MP3 can compress a song by a factor of 10 or 12 and still retain something close to CD quality. So a 30-megabyte sound file from a CD reduces to 3 megabytes or so in MP3. It has an input (probably a USB docking lead that hooks it up to your computer), a memory (either a small hard drive or a flash memory that can store MP3 files), a processor (something that can read the MP3 files and turn them back into music), and an output (a socket where you plug in your headphones).

3. PUSHBUTTON SWITCH

Fig- 4: Push Button Switch

Push-buttons which are normally-open tactile switches. Push buttons allow us to power the circuit or make any particular connection only when we press the button. Simply, it makes the circuit connected when pressed and breaks when released. A push button is also used for triggering of the SCR by gate terminal.

4. TEMPERATURE SENSOR

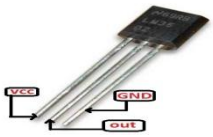


Fig- 5: Temperature Sensor

Temperature sensor is a device to measure the temperature through an electrical signal it requires a thermocouple or RTD. The thermocouple is prepared by two dissimilar metals which generate the electrical voltage indirectly proportional to change the temperature.

5. HEART RATE SENSOR

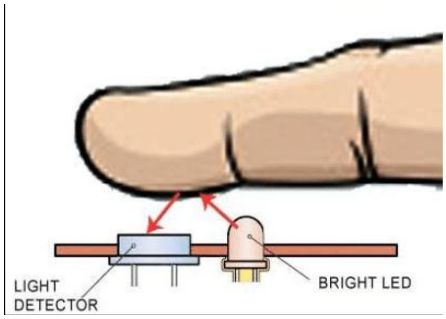


Fig- 6: Heart Beat Sensor

Heart beat sensor which is designed to give digital output of heart beat when a finger is placed on it. This digital output will be interfaced to microcontroller directly to measure the heartbeats in Beats per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse. The comparator IC LM358 is used in Heart Beat Sensor prototype. The LM358 consists of two independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages. The low-power, dual operational amplifiers are connected to a light detector.

6. LDR

Fig- 7:LDR

LDR which basically works on the principle of photo conductivity. It is nothing but, when the light falls on its surface, then the material conductivity reduces and also the electrons in the valence band of the device are excited to the conduction band. These photons in the incident light must have energy greater than the band gap of the semiconductor material. This makes the electrons to jump from the valence band to conduction. These devices depend on the light, when light falls on the LDR then the resistance decreases, and increases in the dark. When a LDR is kept in the dark place, its resistance is high and, when the LDR is kept in the light its resistance will decrease.

7. PIEZO ELECTRIC TRANSDUCER

Fig- 8: Piezo Electric Transducer

Piezoelectric transducer which is an electro acoustic transducer use for conversion of pressure or mechanical stress into an alternating electrical force. It is used for measuring the physical quantity like force, pressure, stress, etc., which is directly not possible to measure. The main principle of a piezoelectric transducer is that a force, when applied on the quartz crystal, produces electric charges on the crystal surface. As the charge produced is very small, a charge amplifier is needed so as to produce an output voltage big enough to be measured.

8. SOLAR PANEL

Fig- 9: Solar Panel

Solar panel which absorbs sunlight as a source of energy to generate direct current electricity. A photovoltaic (PV) module is a packaged, connected assembly of photovoltaic solar cells available in

different voltages and wattages. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications.

5. RESULTS AND DISCUSSION

The final purpose of that is to rescue the soldier from risky conditions. Device might assist in determining the health status of soldier with measures of heartbeats, requirement of explosives, chance sector indication and frame temperature. It would also help in monitoring of every soldier function with the aid of using GPS modem and with GSM modem. it may ship all records to base station in order that in addition important movement might be taken.

Fig- 10: Proposed prototype in action

6. CONCLUSION AND FUTURE SCOPE

The paper reports on wireless technology for tracking of soldiers and information gathering system. RL-78 Board is used that is a low fee solution for the owning reason. Biomedical Sensors presents heart price, frame temperature and environmental parameters of every soldier to base station. This generation may be beneficial to provide the correct place of lacking soldier in important condition and overcome the drawback of infantrymen lacking in motion. The addressing device is likewise helpful to improve the conversation between soldier to soldier in emergency state of affairs and provide right navigation to control room. Therefore we are able to finish that this device will act as a lifeguard to the navy personnel of all over the globe. In destiny, a portable hand-held sensor device with extra sensing alternatives can be developed to useful resource the infantrymen.

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