# GSM BASED SOLDIER TRACKING SYSTEM AND MONITORING USING WIRELESS COMMUNICATION

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*Abstract- To design a soldier tracking system using wireless system for monitoring the parameters of soldier are as  Body temperature & Temperature. Biomedical sensors: Here to find the health status of soldier we are using a body temp sensor to measure body temperature as well as pulse rate sensor. These parameters are then signal conditioned and will be stored in the memory. One of the fundamental challenges in military operations lays in that the Soldier not able to communicate with control room administrator. In addition, each organization needs to enforce certain administrative and operational work when they interact over the network owned and operated by other organizations. Thus, without careful planning and coordination, one troop cannot communicate with the troops or leverage the communication infrastructure operated by the country troops in the same region. The purpose of this investigation was to test the components of the Soldier Tracking and Performance Measurement System against the statement of requirements as found in the Request for Proposal. Secondary aims of this investigation included gathering data that will allow potential users of the system to understand its capabilities and limitations, as well as allow efficient planning of both time and resources necessary to ensure efficient and productive use of the system for training the solider.*

**Index terms: temperature sensor, pulse rate sensor, Soldier Tracking and Performance Measurement System**

## I. INTRODUCTION

In today's world enemy warfare is an important factor in nation's security. The national security mainly depends on army (ground), navy (sea), air-force (air). The important and vital role is played by the army soldier's. There are many concerns regarding the safety of these soldiers. As soon as any soldier enters the enemy lines it is very vital for the army base station to know the location as well as the health status of all soldiers. In our project we have come up with an idea of tracking the soldier as well as to give the health status of the soldier during the war, which enables the army personnel to plan the war strategies. By using the location sent by the GPS modem, the base station can understand the position of soldier. A GPS system can be defined as a device which would help to track the man or a vehicle with no human intervention at all. So far these vehicles have found applications in various fields such as military, vehicles, maps to find way, etc.This project is intended towards representing the problems faced by the solider in the war field in a format to help the solider to get a better solution .The problem that a solider undergoes, difficult for the control station to perceive .The DRDO has taken steps to circumvent the problems of the solider to keep moving forward in the war field .In this we have come with new ideas inorder to help the solider[3,4,5] .

## II. Literature Survey

Umar Farooq et al.,[1]   had   proposed about the public safety in Punjab province Pakistan .they use a 4 stage safety sms system to survey and protect the people's lives. Thuong Le –Tien, Vu Phung[2] had proposed the tracking of vehicles on large outdoor area environment based on GPS and GSM system . With the support of modules the GPS receiver gets to know the exact location and gets the message and gets updates on the google maps.The current technology being used in our work had[9] proposed remote monitoring the soldiers with GPRS based protection system. It measures the heart beat rate, pressure range, temperature range and compared with the actual value stored in the EPROM. If any Discrepancy occurs, and then ARM7 processor will shift The control over to the relief system such as automatic Injection system and Vibrotactile system to simulate The oxygen pumping and also Transmit the Bio-Signals to the base station through GPRS.

Anto bennet et al.[6] had proposed that, it is due to the driver's fatigue, traffic accidents keep with a yearly increasing of a high rate. This paper shows the new fatigue detection

algorithms &techniques using eye blink, alcohol, impact, gas, etc. Sensors. In this technique the fatigue will be detected immediately and regular traps the events driver and third party. Through research presented in this work, we propose an intelligent car system for accident prevention and making the world a much better and safe place to Live.

Designed work had proposed to transmit the data which is sensed from Remote soldier to the server PC by using wieless transmission technology S. It is completely integrated so that it is possible to track anytime from anywhere. It has real-time capability .The accuracy of system is affected by some factors such as weather, environment around the mobile soldier unit, GPS receiver. The future works include optimizing the hardware system, choosing suitable GPS receiver. Improving the routing algorithm can be improved by network. This system has many advantages such as large capability, wide area strange, low operation costs, effective, strong expandability and easy to use. Upgrading this setup is very easy which makes it open to future a requirement which also makes it more efficient.

Anto bennet et al.,[7] had proposed the work is an attempt to design tracking system using GPS and GSM modem .The system is a TELEMONITORING SYSTEM. A software package is developed to READ, ANALYZE and PROCESS the received messages and store them. A communication is instantaneous therefore we can receive running report quickly. So once it is implemented it can track vehicles or humans any time. Anto bennet et al.,[8] this proposed system the authors about the public safety in Punjab province Pakistan .they use a 4 stage safety sms system to survey and protect the peoples lives .By using the four modules we will be able to track the vehicles.Anto bennet et al.,[6] describes tracking of vehicles on large outdoor area environment based on GPS and GSM system. .With the support of modules the GPS receiver gets to know the exact location and gets the message and gets updates on the google maps

III.    Proposed Work

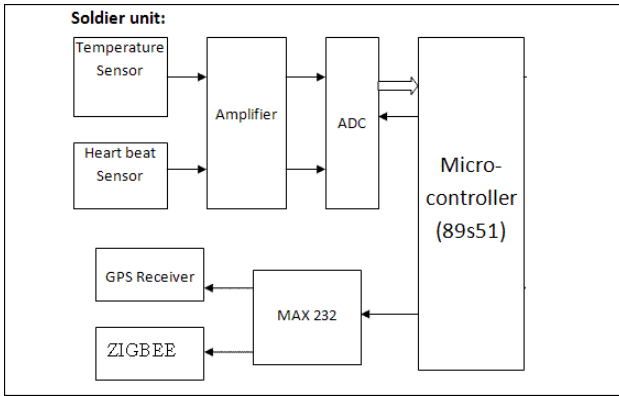Gsm based soldier tracking system and monitoring using wireless communication



Fig 1.Block Diagram of soldier tracking system using wireless system

Here to find the health status of soldier we are using a body temperature sensor as well as pulse rate sensor. These sensors will measure the body temperature and the pulse rate of soldier and will be stored in microcontroller memory .The block diagram is shown in fig 1. The various parameters such as heart beat, pulse rate is obtained from the through the sensors attached to the body on receiving these parameters is first amplified to eliminate the noise and get a clear output signal .the amplified signal is send to the microcontroller 89s52   this is a very efficient microcontroller, 4 pins are used to control the entire system out of 40 pins. The pins according to the coding in the xillinx the 4 pins are named as mes1, mes2, mes3, mes4 (i.e.) message bit 1, message bit 2, and message bit 3 and 4.

The 4 pins receives the parameters and sends to various pins in the 89s51 and process the signal .The processed signal from the microcontroller  is sent to the zigbee transmitter through MAX 232 or RS 232 which is a cable for transmitting and receiving the signals .

The signal is sent to the control station by zigbee transmitter the format of message received by control     station is shown in fig 1.on receiving this message the control unit immediately responds by sending a reply message to crew or a soldier who is in panic our terrible situation to get him out of that place in our proposed system we  have  put forth two extra  events .If the solider gets caught in the enemy camp he has to immediately  deactivate the system so , a deactivation is provided .in order to avoid the enemy crew members to access our tracking system a password is given to the solider (e.g.) (xxyyzzz). The camera is also provided to check and get the terrain information

IV.     Army Unit

Upon receiving the SMS, the visual basic software Sorts the solder's location based on the GPS coordinates also the health Status is displayed. In this way the   army official's can keep a track of all their soldiers shown in fig 2.
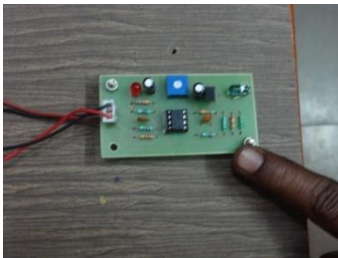


Fig 2: Army Unit



Fig 3: Temperature sensors &Heart beat sensors

V. Temperature sensor and heart bea sensor

This  temperature  sensor  is  used  to  sense  the  temperature of the body this parameter is used  to   calibrate  the  entire temperature  of  the  body   .Through this  it is helpful  to know  the status of  the   solider.  With the help of the heart beat sensor we are able to calculate   the heart beat of the  solider shown in fig 3..

i)   **GPS**

The Global Positioning System (GPS) is a space Based global navigation   satellite   system that   provides   reliable   location   and    time information in all weather and at all times and anywhere on or near the Earth when and where there is an unobstructed line of sight to four or more GPS satellitesshown in fig 4.
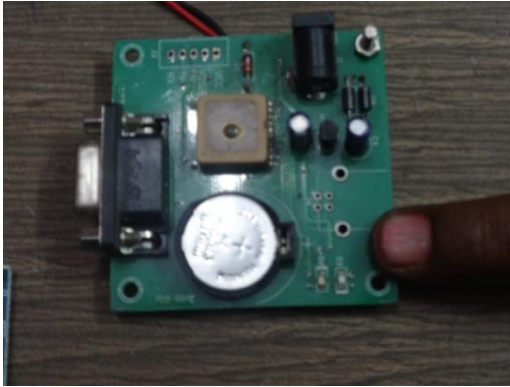
Fig 4:GPS



Fig  5 Amplifier

## ii)    Amplifier

An electronic amplifier, amplifier, or (informally) amp is an electronic device that increases the power of a signal. It does this by taking energy from a power supply and controlling the output to match the input signal shape but with larger amplitude. In this sense, an amplifier modulates the output of the power supply to make the output signal stronger than the input signal. An amplifier is effectively the opposite of an attenuator: while an amplifier provides gain, an attenuator provides lossshown in fig 5.

## iii)   ZIGBEE

Zigbee is a specification which suites , high-level communication used to create a personal area network Zigbee is based on the IEEE.802.15.4standard Zigbee transmission distance is 10-100metersZigbeehas the defined rate of 250kb/sec. Zigbee specification is simpler and less expensive when compared to other wireless personal area networks such as BLUETOOTH and WIFIshown in fig 6.
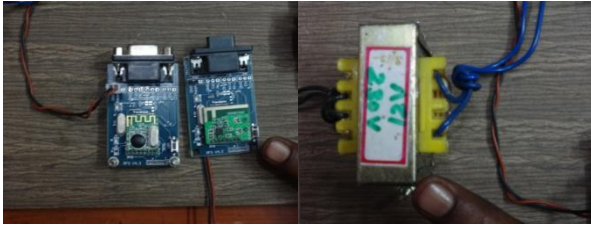
Fig 6 Zigbee          Fig 7 Transformer

### iv)   Transformer

This is the step down transformer, which step downs the 220 volt AC to 12 AC .It act as a main source of power supply. It serves the purpose of tapped windings. Safe wiring techniques for power cords shown in fig 7.
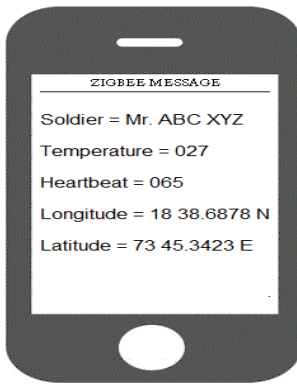
### Message Format



FIG 8;Message Format

This fig 8 is an example message format received to the control station;
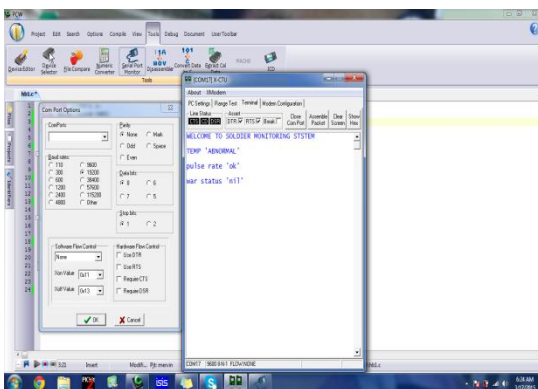
## VI.      Experimental Results
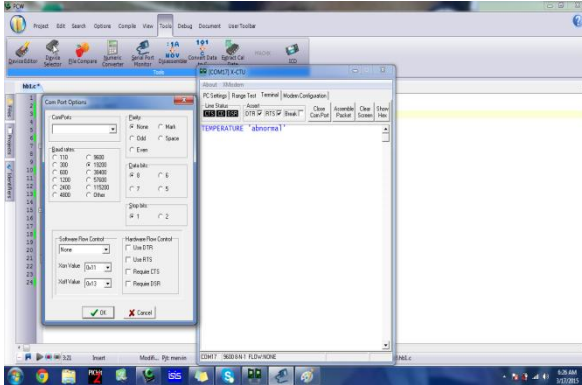


FIG 9: Control Unit

FIG 10: Temperature Measurement

This figure 9 shows the example dialogue box that will appear in the control unit .This message shows that the solider temperature is normal and   pulse rate is in good condition and there is no sign of war proceedings .This   dialogue box was developed in  the XCTC software and the program for this is done with the help of( KEIL VERSION  4).

The  figure10  shows  the  dialogue  box  information  that  the  solider  temperature  is ABNORMAL .This  temperature  is  measured  and  calibrated  using  the  TEMPERATURE SENSOR .This  message  is  received  by  the  control  unit  and  this  indicates  that  the  soldier's temperature is abnormal
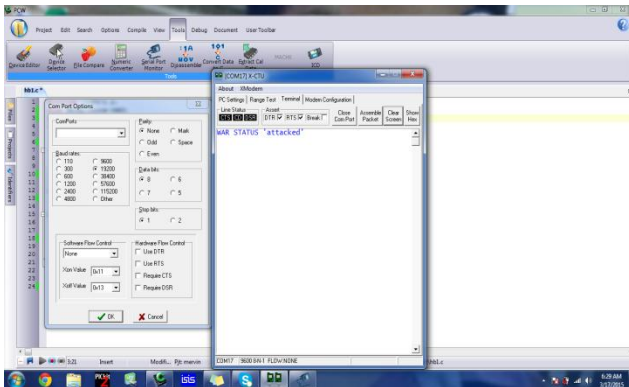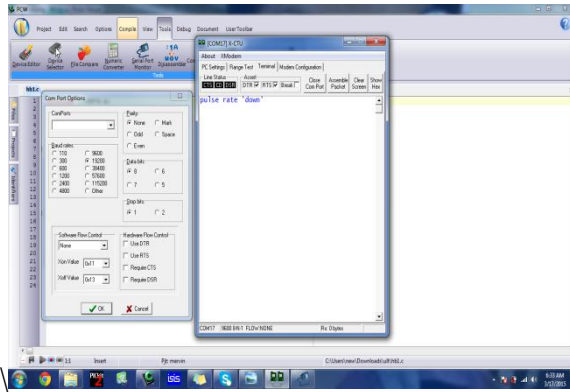


Fig 11: GSM

Fig 12: Pulse Rate

This figure 11 shows that in the field the war has broke and the riot has started .This message indicates that the solider need some help in the war field. figure 12 shows that the soldier's pulse rate is down. This message shows that the solider need some help from control unit

## VII.    Conclusion

From the above designed work can be concluded that we are able to transmit the data which is sensed from remote soldier to the server PC by using wireless transmission technology GSM. It is completely integrated so that it is possible to track anytime from anywhere. It has real-time capability. The accuracy of system is affected by some factors Such as weather, environment around the mobile soldier unit, GPS receiver. The future works include optimizing the hardware system, choosing a suitable GPS receiver improving the routing algorithm can be improved by neural network. This system has many advantages such as large Capability, wide areas range, low operation costs, effective, strong expandability and easy to use. Upgrading this setup is very easy which makes it open to future a requirement.

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