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SOLDIER TRACKING AND HEALTH MONITORING SYSTEM USING GSM OR GPS.

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ABSTRACT

In present scenario nations security has become important constrain. During war, tactics is main factor in any country's security. The nation's security mainly depends on army (ground), navy (sea) and air-force (air). Of which army soldiers plays a crucial role and there are many concerns regarding safety of soldiers. As soon as any soldier enters the war field it is very vital for the army base station to know the location as well as the health status of all soldiers. It is also necessary for the base station to guide the soldier on a correct path if he is lost in the battlefield. So we are implementing 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 GPS, the base station can understand the position of soldier (Latitude and Longitude) as well as health parameters send by GSM using bio-sensors will give base station an idea about his health.

Keywords- Microcontroller, GSM Unit, Heart Beat Sensor, Temperature Sensor etc..

1. INTRODUCTION

We are living in the technological era. where every field is trying to develop it self-using technology and military forces are no exception for it .To protect the boarders of any nation the infantry soldiers of future will be one of the most technologically advance forces in the world. All over the world a lot of research is going on to develop the technologies in which soldiers safety and nations security is prioritize. The countries like United States, United Kingdom developed such systems. During war it is of less benefit to increase number of protective systems and ammunitions until present situation is not provided at the operational edge of military networks. On the war field soldier has to face many challenges like loss in war, low ammunition, health issues, crossing borders etc. So in these situations to get help soldier has to communicate with base station or there should be some facility to guide him. For this purpose we are trying to track location of soldier using GPS, also trying to get his health parameters with the help of biosensors. This information will be send to base station using GSM. As soon as base station will receive all information about soldier, they will be able to guide soldier about the direction, strategy and situation. Also base station will be able to provide necessary help to soldier. In addition tothis we are providing fixed questionkeys which soldier will be allowed to ask to base station. Here google map is used to display the locations of soldiers. With the help of google map it is possible to know the current status of war field also location of each soldier can be seen on single screen which will be more beneficial for army base station to decide its tactics.

2. PROPOSEDSYSTEM

The whole system is divided in to two parts i.e. soldier unit and base unit. Soldier unit is placed on the soldier's body and this unit is divided into three parts. i.e. Biomedical sensors, Emergency keys, GPS+GSM unit. Army base unit is at base station this unit is nothing but a PC on which all the information received from soldier unit will be displayed. To implement this system as real time a main component required is controller. As we are using GPS and GSM units we required two UARTS which available in ARM processor.

Description

In today's world enemy warfare is an important factor in any 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



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GPS modem, the base station can understand the position of soldier. A vehicle tracking system combines the installation of an electronic device in a vehicle, or fleet of vehicles, with purpose-designed computer software to enable the owner or a third party to track the vehicle's location, collecting data in the process. Modern vehicle tracking systems commonly use Global Positioning System (GPS) technology for locating the vehicle, but other types of automatic vehicle location technology can also be used. Vehicle information can be viewed on electronic maps via the Internet or specialized software. In the main they are easy to steal, and the average motorist has very little knowledge of what it is all about. To avoid this kind of steal we are going to implement a system it provides more security to the vehicle. Existing System: In the previous system security lock and alarm is implemented in a car. If a burglar can break open the lock, then it becomes easy for the burglar to steal the car.

3. Block Diagram

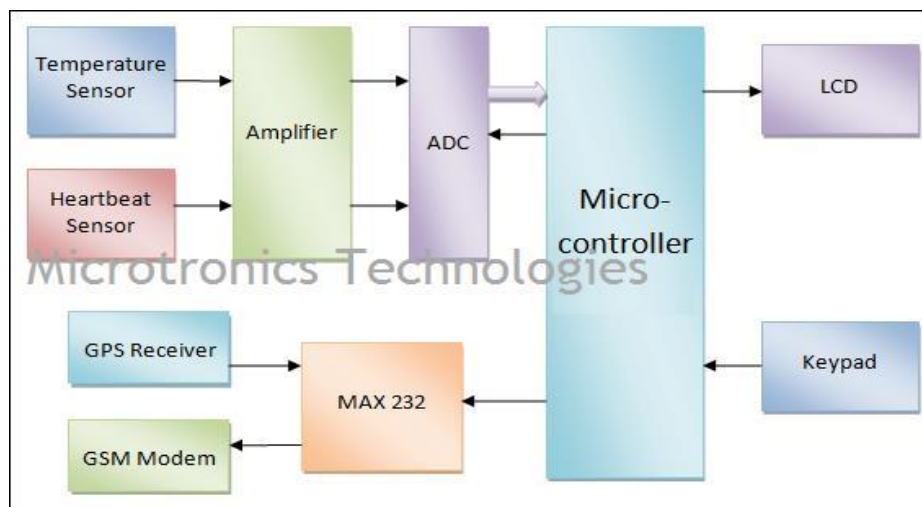


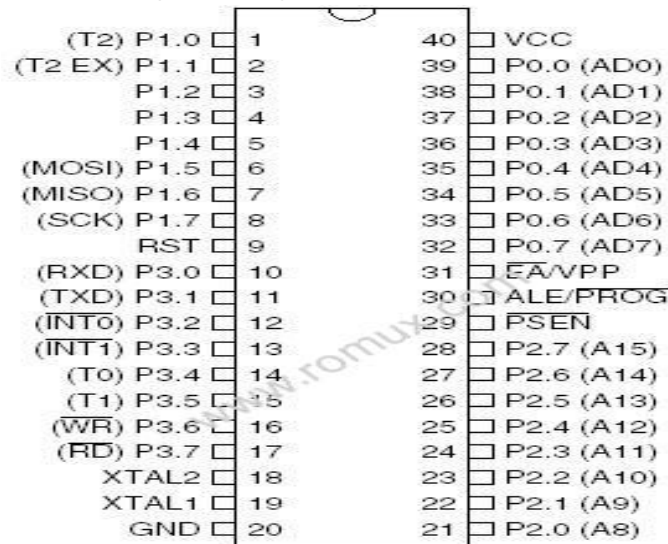
Fig1. Block Diagram of Soldier Tracking and health monitoring system

4. ABOUT 8051 (AT89S51) MICROCONTROLLER

The AT89S52 is a low-power, high-performance CMOS 8-bit microcomputer with 8K bytes of downloadable Flash programmable and erasable read only memory and 2K bytes of EEPROM. The device is manufactured using Atmel's high-density non volatile memory technology and is compatible with the industry-standard 80C51 instruction set and pin out. The on-chip downloadable Flash allows the program memory to be reprogrammed in-system through an SPI serial interface or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with downloadable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications.



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Pin Diagram of 8051 controller

5. GSM OVERVIEW

Global System for Mobile Communications or GSM (originally from GroupeSpécial Mobile), is the world's most popular standard for mobile telephone systems. The GSM Association estimates that 80% of the global mobile market uses the standard. GSM is used by over 1.5 billion people across more than 212 countries and territories. This ubiquity means that subscribers can use their phones throughout the world, enabled by international roaming arrangements between mobile network operators. GSM differs from its predecessor technologies in that both signaling and speech channels are digital, and thus GSM is considered a second generation (2G) mobile phone system. The GSM standard has been an advantage to both consumers, who may benefit from the ability to roam and switch carriers without replacing phones, and also to network operators, who can choose equipment from many GSM equipment vendors.

6. GPS OVERVIEW

The Global Positioning System (GPS) is a space-based global navigation satellite system (GNSS) 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 satellites. It is maintained by the United States government and is freely accessible by anyone with a GPS receiver. The GPS project was started in 1973 to overcome the limitations of previous navigation systems, integrating ideas from several predecessors, including a number of classified engineering design studies from the 1960s. GPS was created and realized by the U.S. Department of Defense (USDOD) and was originally run with 24 satellites. It became fully operational in 1994.

2. GSM MODEM: Fig 1. GSM Modem Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem



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7. PCB LAYOUT

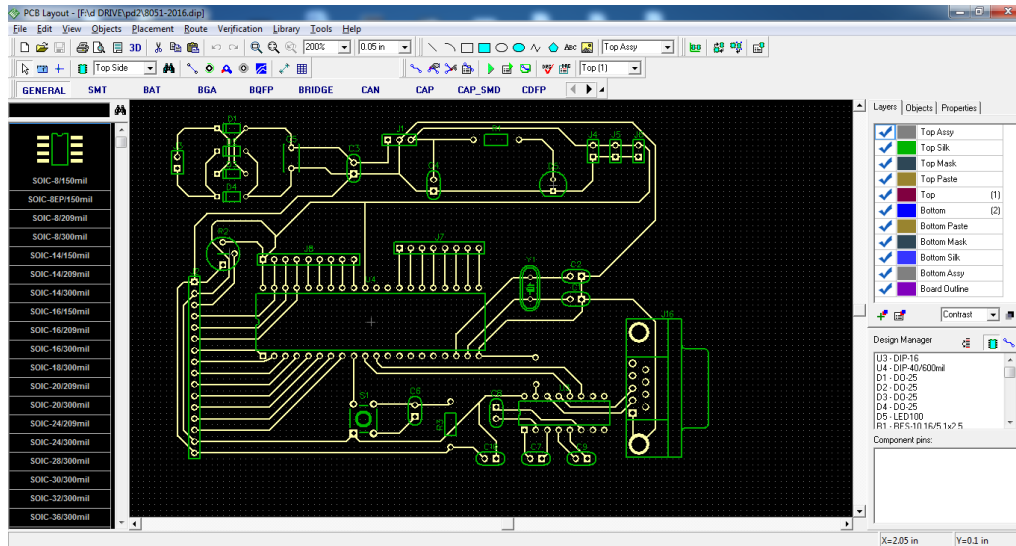


Fig. PCB Layout of soldier tracking and health monitoring system

8. CRYSTAL CKT

The first 6 crystal pulses (clock cycle) is used to fetch the opcode and the second 6 pulses are used to perform the operation on the operands in the ALU. This gives an effective machine cycle rate at 1Mhz

9. MAX232

The MAX232 is a dual driver/receiver that includes a capacitive voltage generator to supply EIA-232 voltage levels from a single 5-V supply. Each receiver converts EIA-232 inputs to 5-V TTL/CMOS levels. These have a typical threshold of 1.3 V and a typical hysteresis of 0.5 V, and can accept ± 30 -V inputs. Each driver converts TTL/CMOS input levels into EIA-232 level



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10. HARDWARE IMPLEMENTATION

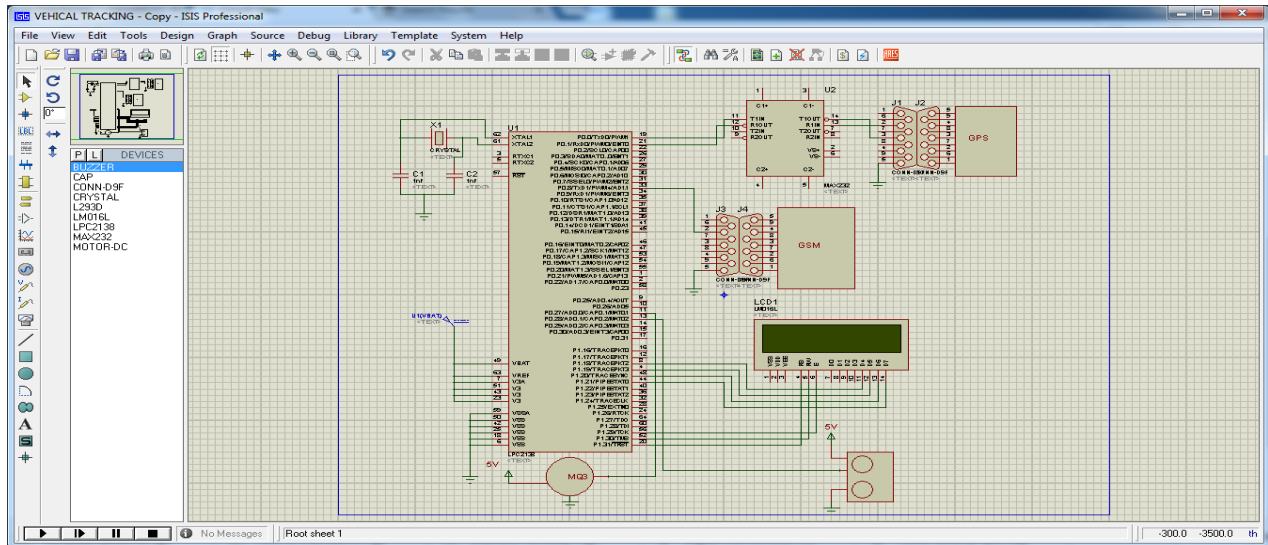


Fig. Hardware Implementation of soldier tracking system

11. SOLDIER UNIT

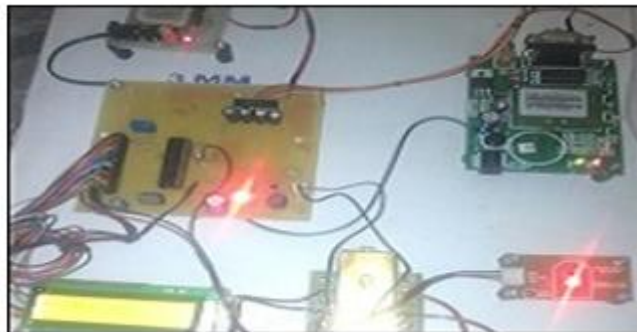


Fig. Shows Hardware Implementation Of Soldier Unit

12. APPLICATIONS AND ADVANTAGES

- No need to go on field.
- Higher reliability.
- Cost effective.
- Fast and efficient.

13. CONCLUSION

GPS finds location of each soldier, thus gives safety for soldiers. As GPS coordinates are available for almost all area of earth so soldier can be tracked anywhere at any time. We can provide emergency help in case of bad health of soldier and by checking health status of soldier's. we can improve safety of soldier. Soldiers can communicate effectively among the headquarters and the members of his squad. Due to the use of ARM 7 processor power



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consumed by the system is minimum. Different circuits used are small in size and carries less weight they are not much bulky so can be carried anywhere

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