Wireless Unmanned all-Terrain Vehicle With Gsm and Gps

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ABSTRACT:
The main purpose of this effort is to design an autonomous Unmanned All-Terrain Vehicle using various modules to have its application in the warfare. Urban warfare is unfortunate reality of the modern world and that fact is unlikely to change in the near future. One significant danger to soldiers in an urban setting is posed by concealed snipers. The large amount of cover among densely packed buildings make snipers hard to detect by sight or sound. When a sniper fires at troops, it is imperative to positively locate the sniper as soon as possible to ensure the safety of soldiers in the field. This project specifically deals with conventional cameras mounted on a remote-operated vehicle. The purpose of this project is to demonstrate that in typical war situations, where the soldiers have the life risk, we would send a vehicle. This vehicle monitors the situation over its surroundings which is operated according to our given directions. We can find the exact location of our vehicle using GPS. Another feature hereby it includes the GSM module which drives the communication channel.

The vehicle described is a recreational Unmanned ATV. It has been outfitted with mechanical actuators and electronic control modules to allow the vehicle to be operated remotely using RF module. The selection and installation of these components is detailed. This includes the control of the ATV’s steering, brakes etc.

Other sensors mounted on the vehicle include a GPS antenna and an electronic compass for establishing the position and orientation of the vehicle. Once assembled, this vehicle was tested in laboratory and field environments to demonstrate its effectiveness. The tests showed that the camera provides a continuous stream of images of a moving target. Overall, these tests demonstrated that such a system is a feasible platform in the warfare. Full implementation would require the fusion of several separate features, the addition of a few new features, such as semi-autonomous operation, and further field testing.

KEYWORDS:
GPS, GSM, LCD, Microcontroller.

INTRODUCTION
Embedded systems are designed to do some specific task, rather than be a general-purpose computer for multiple tasks. Some also have real time performance constraints that must be met, for reason such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs.

Wireless communication has become an important feature for commercial products and a popular research topic within the last ten years. There are now more mobile phone subscriptions than wired-line subscriptions. Lately, one area of commercial interest has been low-cost, low-power, and short-distance wireless communication used for "personal wireless networks." Technology advancements are providing smaller and more effective devices for integrating computational processing, wireless communication, and a host of other functionalities. These embedded communications devices will be integrated into applications ranging from homeland security to industry automation and monitoring.

They will also enable custom tailored engineering solutions, creating a revolutionary way of disseminating and processing information. With new technologies and devices come new business activities, and the need for employees in these technological areas. Engineers who have knowledge of embedded systems and wireless communications will be in high demand.

Unfortunately, there are few adorable environments available for development and classroom use, so students often do not learn about these technologies during hands-on lab exercises.

The communication mediums were twisted pair, optical fiber, infrared, and generally wireless radio. To have the communication in the warfare the soldier will give a call to the kit placed in vehicle engine automatically stop which is indicated by the
DC motor in turn sends the SMS to the authorized person showing the exact location using GPS.

II. Block Diagram:

![Transmitter Section Diagram](image1)

![Receiving Section Diagram](image2)

II. GLOBAL POSITIONING SYSTEM

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 (USDDOD) and was originally run with 24 satellites. It became fully operational in 1994. GPS is considered as a dual-use technology, since it has significant military and civilian applications. GPS has become a widely deployed and useful tool for commerce, scientific uses, tracking, and surveillance. GPS’s accurate time facilitates everyday activities such as banking, mobile phone operations, and even the control of power grids by allowing well synchronized hand-off switching.

![GPS satellite in earth’s orbit](image3)

The above figure shows GPS satellite in earth’s orbit. GPS works in five logical steps:

- The basis of GPS is “triangulation” from satellites.
- To triangulate a GPS receiver measures distance using the travel time of radio signals.
- To measure travel time GPS needs very accurate timing.
- The following figure shows GPS modem which is used in practical.

![GPS modem](image4)

IV. GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

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
A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves.

A GSM network is composed of several functional entities, whose functions and interfaces are defined. The following Figure shows the layout of a generic GSM network.

![Generic GSM Network](image)

The GSM network can be divided into three broad parts. The Mobile Station is carried by the subscriber. The Base Station subsystem controls the radio link with the Mobile Station. The Network Subsystem, the main part of which is the Mobile services Switching Center (MSC), performs the switching of calls between the mobile and fixed network users. The Mobile Station and the Base Station subsystem communicate across the Um interface, also known as the air interface or radio link. The Base Station Subsystem communicates with the Mobile service Switching Center across the A interface.

Here we are using microcontroller which is 8051 series. It has antenna which is in the form of wire. It has external slot for SIM allocation. We can keep any network SIM which is a GSM model. It wants external power supply, this is given by using adaptor which supports 9v and 2A. It has two LEDs for indication of power and network signaling respectively. Power LED emits light continuously. Network signaling LED, at starting blinks fastly and after sometime it starts blinking slowly like single blink per minute. This indicates the SIM got signal according to its network. Then it can send message to any network. The following figure shows the GSM modem widely used in practical.

![GSM modem](image)

**V. MICROCONTROLLER (AT89C52)**

Microprocessors and microcontrollers are widely used in embedded systems products. Microcontroller is a programmable device. A microcontroller has a CPU in addition to a fixed amount of RAM, ROM, I/O ports and a timer embedded on a single chip. The fixed amount of on chip ROM, RAM and number of I/O ports in microcontroller make them idea for many applications in which cost and space are critical.

The microcontroller used in this project is AT89C52. Atmel Corporation introduced this 80C51 microcontroller. The project is implemented on Keil Vision. In order to program the device; preload tool has been used to burn the program onto the microcontroller.

The Micro Controller AT89C52 is a low-power, high-performance CMOS 8-bit Micro Controller with 8Kbytes of in-system programmable Flash memory. The device is manufactured using Atmel’s high-density non-volatile memory technology and is compatible with the industry-standard 80C51 Micro Controller.

The AT89C52 provides the following standard features: 4 Kbytes of Flash, 256 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, five vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator and clock circuitry. In addition, the AT89C52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port and interrupt system to continue functioning. The Power Down Mode saves the RAM contents but freezes the oscillator disabling all other chip functions until the next hardware reset.
VI. RESULTS AND DISCUSSIONS

This project offers a different approach to solving the problem. With the help of this project, we can reduce the risk that we bear from the enemies. By using various modules like GPS, we can locate the position of our vehicle and the wireless camera helps us to drive the vehicle without being noticed by others. The GSM module would be useful in the process of communication. The RF Module made the tire system being operated in wireless mode.

VII. CONCLUSION

With the advent of science and technology in every walk of life the importance of safety of life has increased and the main priority is being given to reduce the harm from other persons. This paper provides the design which has the advantages of low cost, portability, small size and easy expansibility. The platform of the system includes AT89C52, RF module, GPS and GSM, interfacing which increases the efficiency. This system can overcome the problems various dangerous threats from others.

REFERENCES

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