GSM Based Anti-theft Security System Using AT&T Command.

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Abstract
Antitheft security system security system using AT&T COMMAND utilizes an embedded system design with GSM to monitor and safeguard a car. It secures the car against theft. Upon activation, it automatically demobilizes the car by disconnecting the ignition key supply from the car battery. This now makes it impossible for anybody so starts the car, let alone moving with it. In an attempt of theft through the car doors or boot, the system sends text message to the car owner and at the same time starts up an alarm. This design popped out due to the increasing rate at which packed cars are stolen especially in our country, but with this design this packed car is being monitored irrespective of where it is packed, provided there is GSM network coverage. From the research conducted, it was found out that majority of the existing car security system uses only alarm, and doesn't send text message to the car owner let alone of demobilizing the car. But with the use of GSM network, the owner is guaranteed that the car will send text message to his phone, and at the same time, have people around alerted of what is happening. Added to this is that the car will not be move because it has been demobilized. The use of AT&T COMMAND made the design use very few electronics component, look very small and compact that it can be hardly seen when mounted in the car [2].

Keywords- Communication, AT&T Command, Microcontroller, GSM, Networks, Text message, Feedback.

1.   Introduction
 In a situation where there is high level of t heft, there is need for better security system. It is much safer to have a system that monitors and communicates to the device owner without putting human life to risk in the name of "Watchman". This tends to utilize the availability of GSM network, mobile phone and electronics circuit to achieve an automated system which is programmed to work as a thinking device to accomplish this purpose. By simply dialing the phone number of the mobile phone attached to the circuit and sending a code after the phone has automatically been answered, puts the system to either "active or inactive" state, and on any attempt of theft the system sends a text message to the device owner, demobilizes the system (car) and then starts up an alarm. With this, the car is always protected. The total absence of sufficient security personnel in a packed car is a great discomfort to car owners. This insecurity has paved way to increasing rate of stealing packed cars – even with security.In order to enhance an improved and life risk free security system, the purpose of this study is to aid a better security system of cars with the use of GSM. This system monitors one's car against theft, and has a text message sent to the car owner, telling him that his car is being tampered, and at which part of the car (either doors or boot) is being tampered. The system will also demobilize the car (that is stopping the car from moving), set up an alarm for the people around to notice what is happening.

1.1   System Description
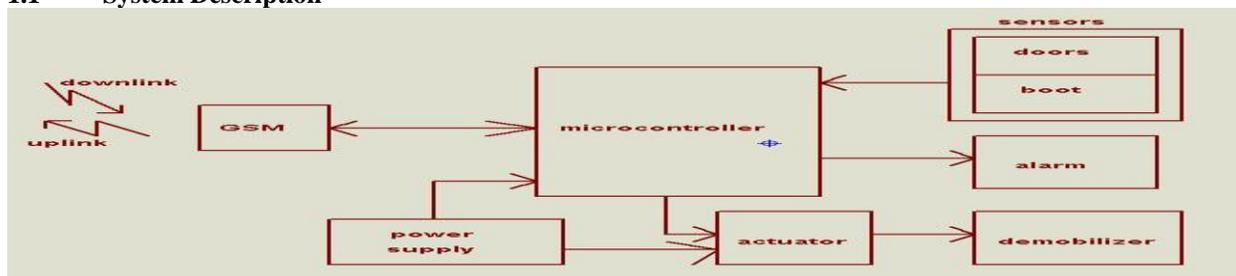
Figure 1: Functional Block Diagram of the System.

The diagram in figure 1. Describe the overall system. The system comprises of a GSM which serves as an intermediate between the outside world (car owner) and the entire system. It is responsible for both receiving of calls for system activation and deactivation, and sending of text message to the car owner. Its output its output fed into the microcontroller. The micro controller which is the brain and control circuit behind the entire design is controlled with a written program stored into its Read Only Memory (ROM). The controller with the direction of the written program co-ordinate the system's operation as follows:

i.   If the system is active, it monitors both the car doors and boot to check if anyone is opened.
ii.   Demobilizes the car by disconnecting the ignition line from the battery supply via the actuator
iii. Sends text message to the car owner signifying where the attempt is made from, and finally
iv.   Starts up an alarm for alert purpose.
v.   But, if the system is inactive, the microcontroller disables all outputs and sensor inputs.

In this paper, the design utilized locally assembled microcontroller and few other basic electronics components to achieve both the control and the controlled. Evidently, microcontrollers have been used to perform such simple security task in which human performance might degrade over time. The reliability of this design makes it durable and capable for offering guarantee security at all time. The power supply provides the voltage and current required for effective performance of the system. This supply is tapped from the car battery and then regulated before being fed to the system.

2. Design Frame Work
2.1 System Design
The design process is divided into two: Hardware and Software designs.

2.1.1   Hardware Design
2.1.1.1   The microcontroller.
he microcontroller is actually a computer on chips. It is a member of the 8051 family of microcontrollers and is 8 bit wide. It has 256 bytes of RAM, 8K of on chip ROM, three timers, 32 inputs and output pins making a total of four ports, each 8 bit wide. 1 serial pin and 8 interrupt sources all on a single chip. In all is a forty pin IC. The AT89C51 microcontroller is an 8 bit processor meaning that the central processing unit CPU can work only on 8 bit. Data larger than 8 bit must be broken down into 8 bit pieces to be processed by the CPU, it is a programmable chip: the availability of software development tools such as compilers, assemblers and debuggers so that it behave exactly as the designer program it. This makes it more effective and reliable in carrying out task especially in a design that involves logic decision and control. The alarm was implemented using a 12V/15W siren.The BC337 bipolar junction transistor is a switching device which switches on the alarming unit [1]. And FET (IRF3205) is a power mosfet [1]. It functions as an actuator to the demobilization unit. Relay is the demobilizer in the system. Voltage regulation is achieved by the use of LM7805 [8]. The figure 2 below gives clearer view of these hardwares.
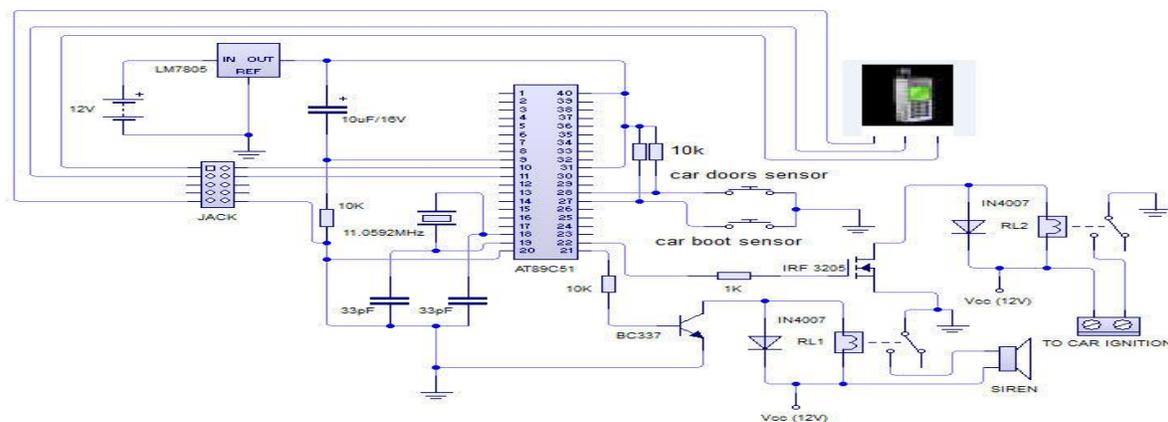
Figure 2: Complete circuit diagram.

2.1.1.2   Interfacing the microcontroller to coordinate the entire system.
Port two bit six (P2.6) and Port two bit seven (P2.7) of the AT89C51 are respectively used as input for doors sensor and boot sensor. Port two bit zero (P2.0) and Port two bit one (P2.1) are used for controlling the alarming unit and the actuator for demobilizing the car.

2.2 Software Design
The program was written in assembly language using the 8051 instruction set. It utilizes AT&T Command codes for its operation and performance. The AT&T command codes are special codes made for easy control and accessibility of compatible phone through programs written to microcontroller (AT89C51) in serial communication mode [4]. The simplicity of the hardware is as a result of the serial communication compatibility of the AT89C51 P3.0 (RXD) and P3.1 (TXD). The AT&T Command is indeed the enhancement of the microcontroller based anti theft security system with GSM (text message) feedback. The flowchart for the program is shown in Figure 3.
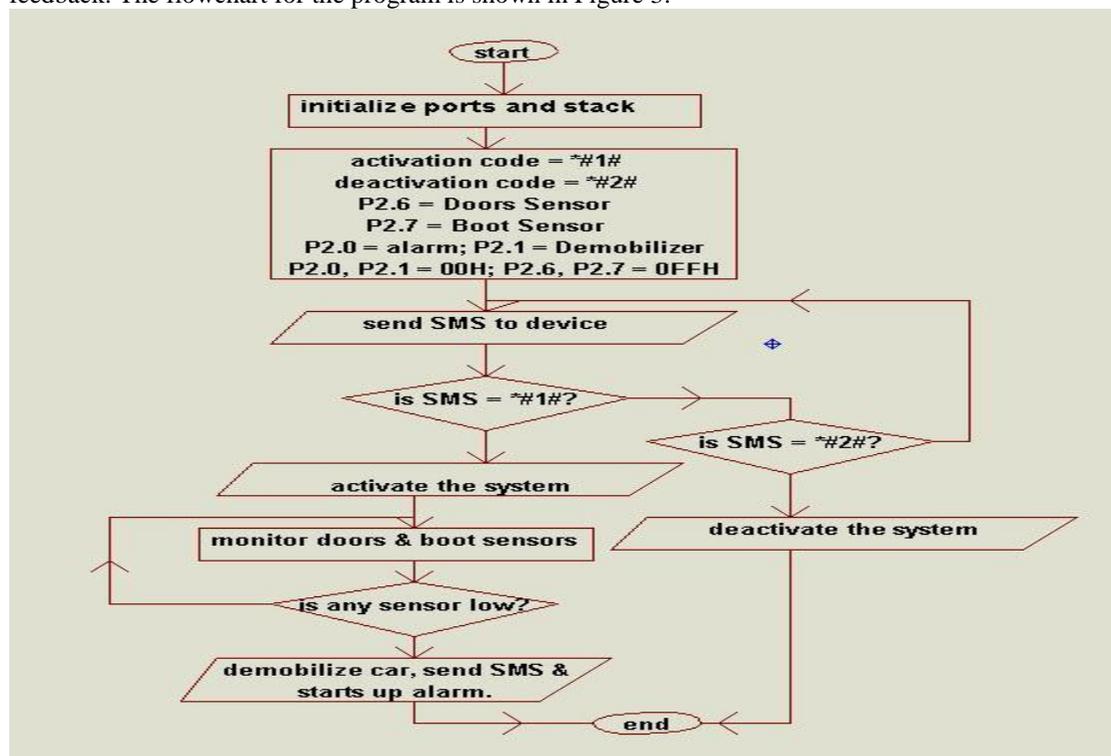
Figure 3: Controlled Program Flowchart.

3.0 PERFORMANCE EVALUATION AND TESTING
After the construction of the entire system, the program was written and burned into the microcontroller chip. On interfacing it to the car, it was tested and found ok as it performed the objective of the design. Satisfaction was gotten from the moment the system was activated and the car opened, the system automatically disconnected the ignition, sent a text message to a programmed recipient and then started up an alarm. The mission of the design was accomplished.
The entire system has serial inputs through P3.0 (RXD) and P3.1 (TXD). The outputs are the text message controller, alarming system and demobilization unit. The system is battery powered and was tapped from car battery and for this reason it made it easier for dc use. With these a system that sends text message to car owner is designed and implemented.
4.0

Conclusion

A cost effective, simple, miniature and robust GSM based anti-theft security system using AT&T command has been successfully designed and constructed. From the input to the output of each stage was a success. The major input is like an interrupt and upon reception by microcontroller it goes through the iteration of demobilizing the car, sending text message and starting up an alarm. The system exhibits a satisfactory performance.

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