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Designing a Vehicle Theft Intimation System Using GPS and GSM Technologies

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***Abstract* - Currently most of the public having their own vehicle, theft is happening on parking and sometimes driving insecurity places. The safety of vehicles is extremely essential for their vehicles. Vehicle tracking system is installed in the vehicle, to track the place. The place of the vehicle is identified using Global Positioning system (GPS) and Global system mobile communication (GSM). These systems constantly watch a moving vehicle and report the status on demand. When the theft is identified, the system sends SMS to the owner with the use of GPS module, and if owner want to track the vehicle then system sends the current location of vehicle to owner. This is all about our project which will help get back owners vehicle as early as possible.**

Keywords: GPS, GSM, Vehicle, Tracking.

I. INTRODUCTION

Vehicle tracking system main aim is to give Security to all vehicles. Theft alert system main aim is to track stolen vehicles. This is improved security systems for vehicles. The latest technologies like GPS are highly useful now a days, this system enables the owner to observe and track his vehicle and find out vehicle movement and its past activities of vehicle. This new technology, popularly called vehicle Tracking Systems which created many wonders in the security of the vehicle. This hardware is fitted on to the vehicle in such a manner that it is not visible to anyone who is inside or outside of the vehicle. Thus, it is used as a covert unit which continuously or by any interrupt to the system, sends the location data to the monitoring unit. When the vehicle is stolen, the location data from tracking system can be used to find the location and can be informed to police for further action. Some Vehicle tracking System can even detect unauthorized movements of the vehicle and then alert the owner. This gives an edge over other pieces of technology for the same purpose. This theft alert system in it detects the theft and the location of the theft occurred and sends GPS coordinates to the specified mobile, computer etc.

The motion detection circuit in it is used to detect unauthorised movement of the vehicle. When the vehicle is started then a warning will be automatically sent to the intended receiver. The accelerometer sensor which is additionally interfaced to the microcontroller is used to detect unauthorised movement, in any case if any mishap occurs then its warning will be directly sent to the intended receiver.

When a request by user is sent to the number at the modem, the system automatically sends a return reply to that particular mobile indicating the position of the vehicle in terms of latitude and longitude. A program has been developed which is used to locate the exact position of the vehicle and to navigated track of the moving vehicle on Google Map also, it is used to switch the system "ON or OFF" remotely.

II. METHODOLOGY

A) System Overview

1) Microcontroller- ATmega328p
2) GSM Module- GSM SIM 900A
3) GPS Module- GPS NEO-6MV2
4) Accelerometer and Gyroscope Sensor Module-MPU 6050
5) FTDI Communication Module
6) Key Switch
7) 20X4 LCD Display
8) Power Supply Adapter (12V/2A)

B) Block diagram of the System

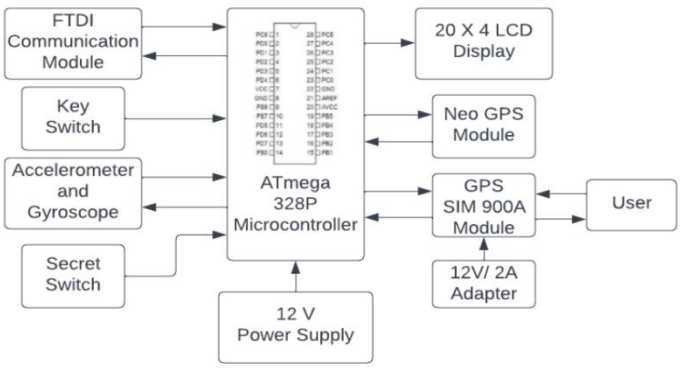

Figure 1: Block Diagram

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C) Circuit diagram of the System

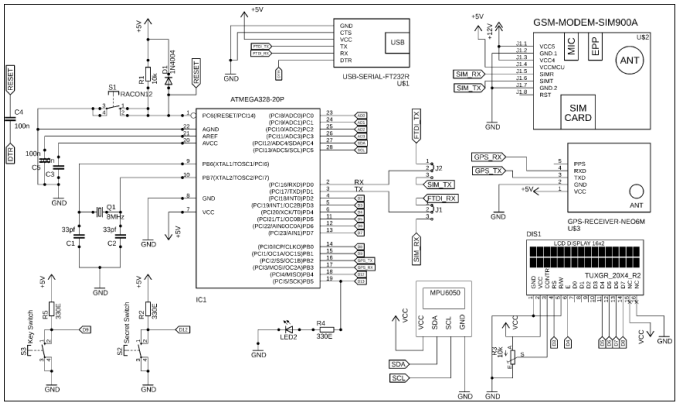

Figure 2: Circuit Diagram

III. DESIGN AND IMPLEMENTATION

First, we completed the whole design of our system. As per the design, parts were procured. After parts acquisition, we made a quick step by step plan to implement the system development process.

A) Assembly

First, we took the entire components microcontroller ATmega328P, FTDI Communication module, Key switch, Accelerometer & Gyroscope Sensor, GPS module, GSM module, LCD Display and Secret Switch. Then assemble all the components on zero PCB as per the circuit diagram. Then, using jumper setting we installed the code into the microcontroller.

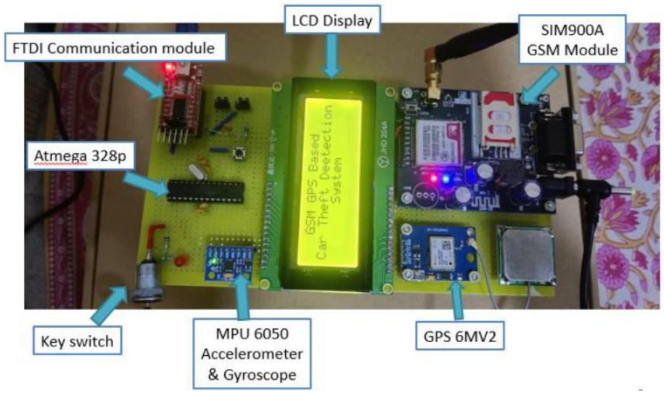

Figure 3: Assembled System

B) Calibration and Testing

We tested individuals' components including microcontroller and Serial communication module. GSM module was calibrated using Vodafone sim card. We checked the primary connections between all the modules.

C) Implementation of System

Circuit for the complete system was designed on paper. We developed the code following the connections and application. After uploading code, we made the circuit using jumper wires as a prototype to testing. After some changes in code and wiring, final setup was ready. The same circuit was made on Eagle software and after some revisions and corrections final system was implemented. When the vehicle get stolen, the user or owner was intimated by two ways, first way if the activation key is started then our system sends massage like "Key Activated if done by you Reset the secret switch and ignore the massage" as shown in fig. 4. The second way if car is moved from its parked place then our system sends massage like "CAR ACTIVATED if done by you Reset the secret switch and ignore the massage" as shown in fig. 4.

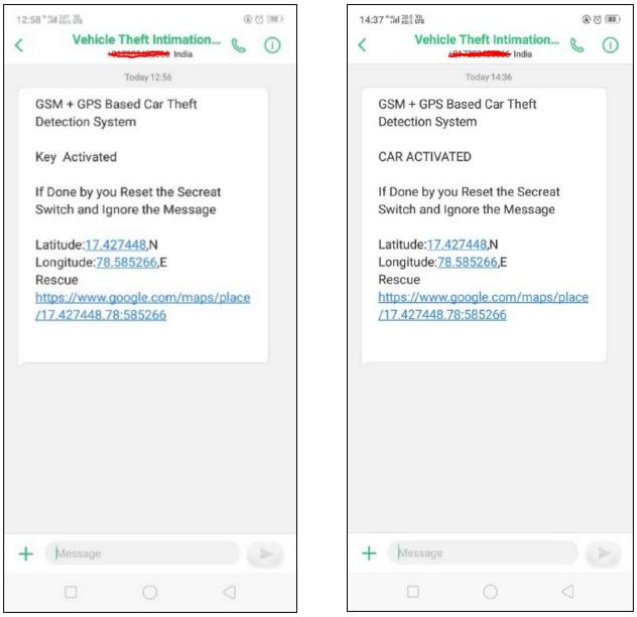

Figure 4: Key Activated SMS & Car Activated SMS

The owner can also track its vehicle location at any time he want by just sending a "TRACK" message to our system, the system sends the current location of the vehicle as shown in the fig.4 with latitude and longitude coordinates.

The owner can also stop the tracking mode whenever he want by just sending a "STOP" message to our system, the system sends the message like "SYSTEM DEACTIVATED" and stop sending the location coordinates as shown in fig. 5.

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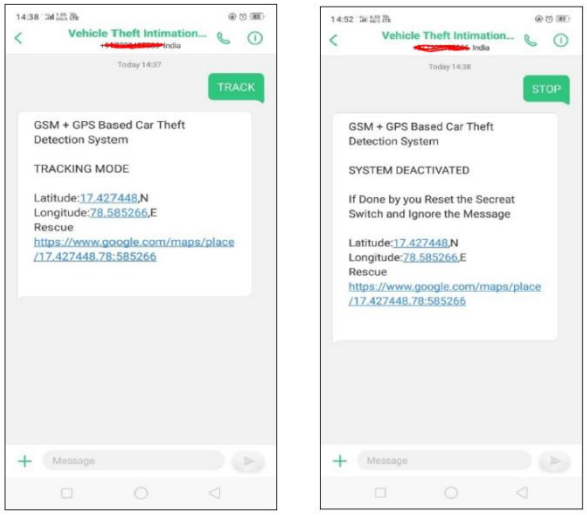

Figure 5: Tracking Mode & System Deactivated

D) Program Flow Chart of System

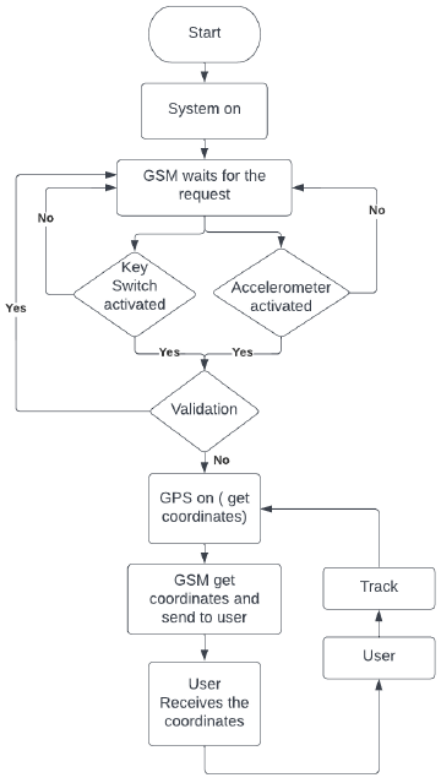

Figure 6: Flow chart of the system

When the system is turned on, initially it is in an ideal state and the GSM module waits for the request. If the Key switch is activated then a validation message is sent to the registered mobile number. If the validation is true then the system goes under sleep mode. On the other hand if the validation is false then the system generates the latest coordinates using GPS module and sends an message to the registered mobile number.

This functionality is used when a master key or the key of the car itself is used unauthorisedly. Also, when the car is moved manually, the acceleration is detected by the accelerometer and GSM module sends validation SMS to the user. If the validation is true then system goes in sleep mode and if the validation is false then the system sends the latest vehicle coordinates to the user. The user also has remote access to the system. By sending message to the GSM module the user can get the latest coordinates of the system. The user can also disable the security system remotely if a know person or any relative is using the vehicle.

E) Final System

Figure 7: Final system

F) Improvements

1) By raising the cost of GPS receivers, we can improve accuracy of system.
2) We can reduce the kit's size by combining GPS and GSM on the same module.
3) We can add more sensors for better accuracy.
4) We can use accelerometer data to analyse driver behaviour.

G) Future Scope

1) With developments in communication and electronics the system can be upgraded.
2) It can be programmed to send a message to the police station for immediate action.
3) Can be modified and programmed by placing a camera and sending the mms to owner & police.

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4) We can reduce the size of the kit by using GPS+GSM on the same module.
5) We can increase the accuracy up to 3m by increasing the cost of the GPS receivers.

IV. CONCLUSION

Vehicle tracking system makes better fleet management and which in turn brings large profits. Better scheduling or route planning can enable you to handle larger job loads within a particular time. Vehicle tracking both in case of personal as well as business purpose improves safety and security, communication medium, performance monitoring and increases productivity. So in the coming year, it is going to play a major role in our day-to-day living. This report covers the design and implementation of vehicle theft intimation system that can give the remote location of our vehicle if it got stolen. It can be seen from the results obtained that it is possible to design and implement such a system using a GSM modem, GPS modem and a microcontroller. Although the location was sent to an SMS, it can easily be accessed since most people have smartphones these days with internet access. When a man who has stolen a vehicle with such a system in it is arrested later in the future, he would not want to carry out such a criminal act again knowing that he could be arrested anytime. With such a system, many vehicle thieves would think twice before indulging in such criminal acts. Hence, it is expected that the rate at which vehicles are stolen should drop further if such a system is implemented.

REFERENCES

[1] Samuel Farayola Kolawole and Alexander Zakari, Design of Anti-Vehicle Theft System using GSM and GPS with Image Acquisition.
[2] Baburao, K., Raju, V. K., Srinivasa, S. R., Prabu, A.V., Rao, T. A., & Narayana, Y. V., GSM and GPS Based Vehicle Location and Tracking System.
[3] Ashad, M., Hassan, J., Mohtashim, B., Rameez, A. K., Zeeshan, M. Y., Zeeshan R. & Safdar, K, Vehicle Intrusion and Theft Control System using GSM and GPS.
[4] Ibrahim S. Shehu,Olumide S. Adewale, Muhammad B. Abdullahi & Solomon A. Adepoju, Vehicle Theft Alert and Location Identification Using GSM, GPS and Web Technologies.
[5] Joel Sachin, Kiran Rana Gill, Anti-Theft System For Vehicles Using Fingerprint Sensor.
[6] M. Uday Kumar Naidu, Dr. K. Prahlada Rao, Theft Detection and Controlling System of a Vehicle Using GSM
[7] Prof. Shikalgar Parvin B., Mr. Suraj Shivaji Sutar, Mr. Akash Nandkumar suryawashi, Mr. Prasad Hindurav Zambre, Mr. Abhijit shivaji kashid, Vehicle Theft Detection and Tracking Based on GSM and GPS.
[8] Kunal Maurya, Neelu Jain, Mandeep Singh, Real Time Vehicle Tracking System using GSM and GPS Technology-An Antitheft Tracking System.
[9] Abu Taher Noman, Samzad Hossain, Shariful Islam, Mohammad Emdadul Islam, Nawsher Ahmed, M A Mahmud Chowdhury, Design and Implementation of Microcontroller Based Anti-Theft Vehicle Security System using GPS, GSM and RFID
[10] Suleiman, Garba, Shehu, Ibrahim Shehi, Adewale, Olumide Sunday, Abdullahi, Muhammad Bashir, Adepoju, Solomon Adelowo, Vehicle Theft Alert and Location Identification Using GSM, GPS and Web Technologies.
[11] Prof M. Geetha, T. Priyadarshini, B. Sangeetha, S. Sanjana, Anti-theft and tracking mechanism for vehicles using GSM and GPS.
[12] Hui Hu, Lian Fang, Design and Implementation of Vehicle Monitoring System Based on GPS/GSM/GIS.
[13] Ch Bhanu Prakash, K. Sirisha, Design and Implementation of a Vehicle Theft Control Unit using GSM and CAN Technology.
[14] Ambade Shruti Dinkar and S.A Shaikh , Design and Implementation Of Vehicle Tracking System Using GPS.
[15] Sandeep Singh, Poonam Kumari, Automatic Car Theft Detection System Based on GPS and GSM Technology.
[16] Iman M. Almomani, Nour Y. Alkhalil, Enas M. Ahmad, Rania M. Jodeh, Ubiquitous GPS vehicle tracking and management system.
[17] Qiang Liu, Huapu Lu, Bo Zou, Research and Design of Intelligent Vehicle Monitoring System Based on GPS/GSM.
[18] Puji Valen Crisgar, Patrick Ryan Wijaya, Marcell D. F. Pakpahan, Eniman Yunus Syamsuddin, GPS-Based Vehicle Tracking and Theft Detection Systems using Google Cloud IoT Core & Firebase.
[19] Pravada P. Wankhade1 and Prof. S.O. Dahad, Real Time Vehicle Locking and Tracking System using GSM and GPS Technology-An Anti-theft System.
[20] Sathe Pooja, Vehicle Tracking System Using GPS.
[21] R Bavya, R Mohanamurali, Next generation auto theft prevention and tracking system for land vehicles.
[22] Jian-ming Hu, Jie Li, Guang-hui Li., Automobile Anti-theft System Based on GSM and GPS Module.
[23] K. A. Mamun, Z. Ashraf, Anti-theft vehicle security system with preventive action.
[24] MD. Masud Rana, Tanjir Alam, Nayon Kar, MD. Shahjalal Raju, Vehicle Theft Detection with Remote Control Engine Locking.

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