GPS-GSM based Vehicle Tracking System

Tarun Karkera, Aparna Dubey, Shefali Kamalnakhawa, Sharvari Mangale

Abstract— **Avoiding car theft is impossible but now finding your stolen car will be easier! You just need to install Real-Time Vehicle Tracking System with the GSM+GPS module hidden in your car, maybe in your trunk, in the glove compartment or under the spare tire. Then connect the GSM and GPS antenna and a SIM card, all of this powered with a battery and you are ready! If you want to locate your car open the 'SPYder' App and request location, longitude and latitude at the moment. The 'SPYder' app used this data to track the location on Google Maps. This system is programmed to recognize your number and only if it is correct it will send you this data. Thanks to this system you can track your car in real time.**

Index Terms— **Real-time car tracking, fleet tracking, personal tracking, gps tracking, mobile gps tracking.**

I. INTRODUCTION

Vehicle tracking system main aim is to give security to all vehicles. This is improved security system for vehicles. The latest technology like GPS are highly useful now days, this system enables the owner to observe and track his vehicle and find out vehicle movement and its past activities of vehicles.

The 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 interrupt 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.

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 location of the vehicle and also to navigated track of moving vehicle on Google Map.

Real time tracking and management of vehicle has been a field of interest for many researchers and a lot of research work has been done for tracking system.

Tarun Karkera, Department of Information Technology, PVPPCOE, Sion, Mumbai – 400042

Aparna Dubey, Department of Information Technology, PVPPCOE, Sion, Mumbai – 400042

Shefali Kamalnakhawa, Department of Information Technology, PVPPCOE, Sion, Mumbai – 400042

Sharvari Mangale, Department of Information Technology, PVPPCOE, Sion, Mumbai – 400042

II. METHODS AND MATERIALS

A. Overview Of Proposed System

This Vehicle tracking system takes input from GPS and send it through the GSM module to desired mobile using mobile communication. Vehicle Tracking System is one of the biggest technologies advancements to track the activities of the vehicle.

The security system uses GPS, to find the location of the monitored or tracked vehicle and then uses satellite or radio system to send the coordinates and the location data to the mobile. In this way the Vehicle owners are able to track their vehicle on a real-time basis.

The proposed system is used for positioning and navigating the vehicle with an accuracy of 10m. The exact location is in the form of latitude and longitude along with the exact navigated track on Google Map.

The System tracks the location of particular vehicle and sends to users mobile in form of latitude and longitude is used to locate the vehicle on the Google maps and also we can see the output on the LCD.

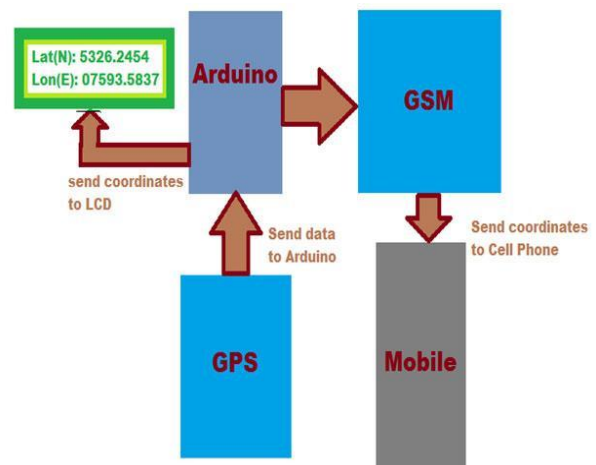## III. BLOCK DIAGRAM OF PROPSED SYSTEM

Fig 1. Block Diagram

For designing this hardware many types of devices are used to make it perfectly work. All devices are purchased from different manufacturers.

A. Power Supply

It consists of step down transformer, bridge rectifier, capacitors and voltage regulators ICs. 230V AC is converted to 12V DC is regulated using voltage regulator and used to power GPS and GSM Modules. Further it is reduced to 5V DC using voltage regulator to power the micro-controller.

B. Microcontroller ATMEGA 328

The Atmel AVR core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are connected to the ALU, allowing two independent registers to
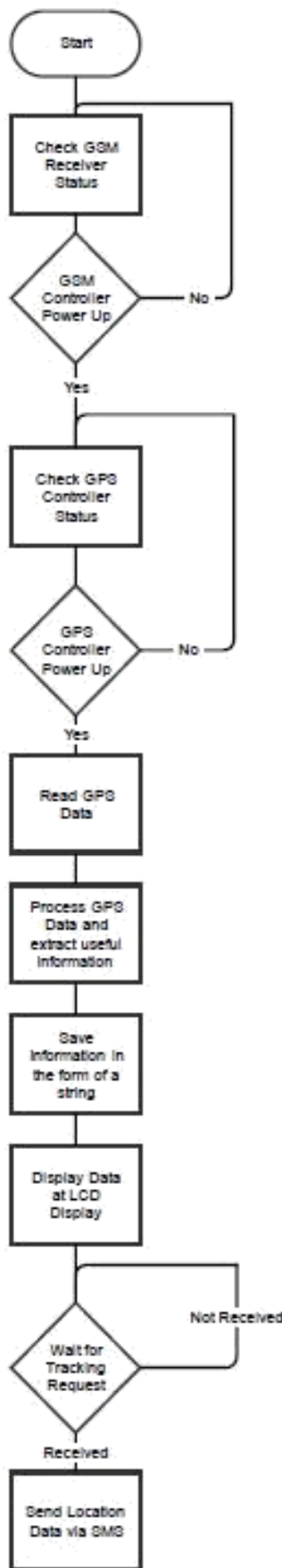
Fig 2. Flowchart of the system

be accessed in one single instruction executed in one clock cycle.

C. GSM Module

A GSM modem is a specialized type of modem which accepts SIM card, and operates over a subscription to a mobile operator perspective, a GSM modem looks like just a mobile phone and this modem is used to send the location via text.

D. GPS Module

A GPS navigation device is a device that accurately calculates geographic allocations by receiving information from GPS satellites. The satellite data is free and works anywhere in the world.

E. LCD

A Liquid-crystal display is a flat panel display, electronic visual display that uses the light modulating properties of liquid crystals

IV. SYSTEM OPERATION

The At mega 328 microcontroller is interfaced serially to a GSM Modem and GPS Receiver. A GSM Modem is used to send the position of the vehicle from a remote place. The GPS modem will continuously give the data i.e. the latitude and longitude indicating the position of the vehicle.

The GPS modem gives many parameters as the output, but only the NMEA data coming out is read and displayed onto the LCD. NMEA protocol consists of set of messages which are ASCII character set. GPS receives data and presents it in the form of ASCII comma – delimited message strings. '$' sign is used at the start of each message. The locations (latitude and longitude) have the format of ddmm.mmmm (degrees minutes and decimal minutes). The software protocol consists of GGA (global positioning system fixed data) and GLL (geographic position – latitude/longitude) But in this system we are using GGA only.

V. SYSTEM IMPLEMENTATION

A. Hardware Implementation

Check GSM receiver status If GSM controller powered up, proceed, else wait. Configure GSM in SMS mode. Check network. If network found, proceed else wait. Check for GPS controller status. If GPS controller powered up, proceed , else wait. Wait for 'track vehicle request'. If request received, extract latitude and longitude from GPS data string and proceed, else wait. Send data to registered mobile number and go to 'track vehicle request'.

B. Software Implementation

On launch, the app asks user to login via provided credentials. The App waits for ' Locate' button to clicked which sends message to the tracking device. The App waits for a message from the tracking device. When the message is received the location is showed in the map fragment present in the activity.

VI. CONCLUSION

Vehicle tracking system makes better fleet management and which in turn brings large profits. Vehicle tracking both in case of personal as well as business purpose improves

safety and security, communication medium, performance monitoring and increases productivity.

The project is all about controlling theft of a vehicle and about making vehicle more secure by the use of GPS, GSM technology.

REFERENCES

[1] Krishna Kant, "Microprocessor and microcontroller", Eastern Company Edition, New Delhi 2007.
[2] Asaad M. J. AL-Hindawi, Ibraheem Talib, "Experimentally Evaluation of GPS/GSM Based System Design", Journal of Electronic Systems, Volume 2 Number, 2 June ,2012.
[3] Chen, H., Chiag, Y. Chang, F. H. Wang, Toward Real- Time Precise Point Positioning: Differential GPS Based on IGS Ultra Rapid Product, SICE Annual Conference, The Grand Hotel, Taipei, Taiwan August 18-21,(2010).
[4] William Stalling, "Wireless Communication and Networks", 2nd edition, Prentice hall of India, 2005.
[5] Kunal Maurya, Mandeep Singh, Neelu Jain, " Real Time Vehicle Tracking System using GSM and GPS Technology- An Anti-Theft Tracking System", International Journal of Electronics and Computer Science Engineering, ISSN 2277-1956/V1N3-1103-1107