# Vehicle Tracking With Black Box System Using Android

[1]T. Pragathi, [2]K.Soundarya, [3]S.Poornima, [4]P.C.Siva Kumar

[1,2,3]Students, [4]Assistant Professor
Department of EEE, Mahendra Engineering College, Namakkal, India.

***Abstract*: The main motive of our paper is to develop a black box for any vehicle all over the world. This black box not a complicated circuit. Vehicle black box is to maintain vehicle in safer ways. It is used to find the location of the vehicle. Back up data is used to find the condition of vehicle. Like, location and halt times. It is also used to theft monitoring. This vehicle distance of the object is displayed by the LCD display. GPS (Global Positioning System is used to measure the location in terms of latitude and longitude along with accurate time. GSM (Global System for Mobile Communication) is transfer the message to the mobile application. Sensors are used to prevent the vehicle in the form of accident. It can be installed any vehicle all over the world. This construction contribute to safer vehicles, improving the treatment for crash victims, helping to insurance companies with their vehicle crash investigations, and enhancing the road status in order to decrease the death rate. Relay control is used to control the vehicle in the form of (NO) normally open and (NC) normally closed. The ignition unit is used to turn on and off the circuit if any disturbances occur. Whole circuit is monitored by a android application.**

***Index Terms*: Black box, GPS, GSM, Accident, Android.**

---

## I. INTRODUCTION

According to the World Health Organization, more than million people in the world die each year because of shipment corresponding accidents. Nowadays operating system is not only on desktops but it is obtainable on handheld mobile devices also. The mobile plays a very pivotal part in today's the community. We are trying to install a comparable concept for vehicles which assist us to mitigate or pre-empt accidents. Though personal computers and the Internet have establish absolute ways to couple people, to entertain them and let them interchange the information, not one of these can reach each human being anywhere and anytime as the cell phone does. In order to realize which type of sensors to be establish into the vehicle various types of research are done and following ones are examine as the most dominant data that is needed after the accident. This system is mainly perform to two segments. The first one is observe and assemble the information from the vehicle. The second is how to present the data to the user easier method. Speed is one of the most vital and basic danger factors in driving. It not only attack the severity of the crash, but also increases threat of being associated with in a crash. GPS has become an essential part of a vehicle system. GPS is a favoured technology which as grow by American Department of Defence (DoD) for military use. Later on it was available for Non-military use. It can produce exact time, location correlate and speed. On the other hand, Global System for Mobile communications (GSM) is a digital mobile telephony system that is broadly used. More than 690 mobile networks issue GSM services across 213 countries and GSM represents 82.4% of all global mobile interconnection. Many researchers convey out their studies on accident detection system. Our system first detects the lane of the road and nearby vehicle. The entire designed system is valuable for the avoidance of accident causing, which involves various applications has pointed below. In the event of accident, this wireless device will transfer mobile phone short message in point out the position of vehicle by GSM/GPS system to family member, emergency medical service (EMS) and nearby hospital so that they can provide ambulance and prepare treatment for the patient. If the distance between to vehicles is minimum automatically the fuel flow will be reduced.

## II. EXISTING SYSTEM

The existing system of black box works with help of GPS, IR Sensors, Relay control, Microcontroller, Power supply unit and Alcohol sensor. GPS tracking system helps the receiver to track the location of the object which they are tracking. Example, A parent can track their children, A business men can track his driver's location, A manufacturer can track his goods. As GPS enables to track the exact location of the moving assets, it helps the entrepreneur can watch the movement of the assets. In case, if the asset has been stolen (or) misplaced, The GPS tracking unit helps to find out the asset. The GPS tracking unit helps to identify the location alone. The existing black box does not help to capture the incident if an accident occurs. There is no accurate proof for the accident. We can't able to see live location of the vehicle and also can't able to store whole data of the vehicle. IR sensor has low frequency rage this disadvantages are advantage in our proposed system.

## III. PROPOSED SYSTEM

The alcohol sensor is used to detect whether the person is consumed by alcohol or not and the ultrasonic sensor is used to find the distance between the vehicles. The analog to digital converter is used to convert the analog signal to digital signal. The micro controller is used for programming and it requests the relay to turn off when the sensor senses any disturbances occur between the vehicles while travelling. If a person is consumed by alcohol it will indicate to the micro controller and it turn off the relay. The micro controller accepts only the 5V as a input so, the regulated power supply is used to generate the 5V. The micro controller works on 5V only. Global Positioning System (GPS) is used to find the position of the vehicle by using the longitude and latitude

axis. It is used to update the live location of the vehicle at the time of travelling. Global System for Mobile communication (GSM) is used for passing the message to the mobile such as the distance covered by the vehicle, how many the vehicles has been stopped and the live updation of the particular vehicle will be send as a message to the user mobile. SD card is used to store the information about the live status of the vehicle. Ignition unit in the vehicle black box system is used for on and off of the vehicle. By using the android app which is installed in the mobile displays the live status and live location of the vehicle.

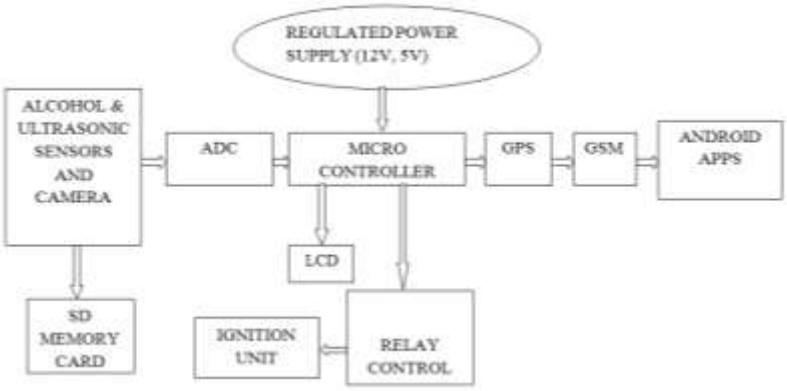


**Fig.1 Vehicle Tracking System**

**1. Regulated power supply**

A voltage controller is proposed to normally keep up a predictable voltage level. A voltage controller may be a direct "feed-forward" structure or may fuse negative analysis control circles. It may use an electromechanical instrument, or electronic parts. Dependent upon the arrangement, it may be used to control no less than one AC or DC voltages. Electronic voltage controllers are found in contraptions, for instance, PC control supplies where they settle the DC voltages used by the processor and distinctive parts. In vehicle alternators and central power station generator plants, voltage controllers control the yield of the plant. The controller trading rate is by and large 50 to multiple times each second. Electronic voltage controllers utilize solid state semiconductor devices to smooth out assortments in the surge of current. A great part of the time, they function as factor insurances; that is, resistance reduces when the electrical load is generous and increases when the stack is lighter. Voltage controllers play out a comparative limit in far reaching scale control dispersal systems as they do in motor vehicles and distinctive machines; they limit assortments in voltage in order to guarantee the apparatus using the power.

**2. Alcohol Sensor**

It is used to detect the person whose consume alcohol. It has a high sensitivity and fast response in time. The sensors can active temperature ranging from -10 to 50° C with a power supply is less than 150 Ma to 5V. The sensing range is from 0.04 mg/L to 4 mg/L, which is suitable for breathalyzers.

VCC –Input power supply
GND –Supply ground
DO –Digital output
AO- Analog output

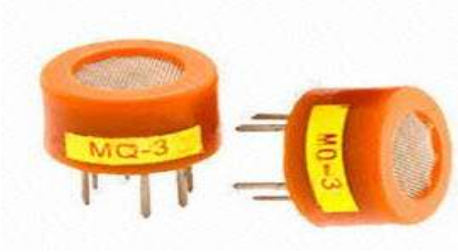


**Fig.2 Alcohol Sensor**

**3. Ultrasonic Sensor**

It is used to measure the distance between the vehicle and other objet around it. It emits an ultrasound at 40 000 Hz which travels through the air and if there is an object or obstacle on its path It will bounce back to the module.

VCC -5V dc
Trigger-Pulse input that trigger the sensor
Echo -indicates the reception of echo from the target

**Fig.3 Ultrasonic Sensor**

### 4. Analog to Digital Converter

Simple to advanced converter is a framework that changes over a simple flag, for example, a sound grabbed by an amplifier or light entering a computerized camera, into an advanced flag. An ADC may likewise give a detached estimation, for example, an electronic gadget that changes over an info simple voltage or current to an advanced number speaking to the extent of the voltage or current .Typically the computerized yield is a two's supplement double number that is relative to the information , however there are different conceivable outcomes.

### 5. Microcontroller

The Arduino Uno is a microcontroller board reliant on the ATmega328. It has 14 electronic info/yield pins (of which 6 can be used as PWM yields), 6 basic data sources, a 16 MHz stoneware resonator, a USB affiliation, a power jack, an ICSP header, and a reset get. Though most PCs give their own one of a kind inside security, the circuit gives an extra layer of affirmation. If more than 500 mA is associated with the USB port, the wire will thus break the relationship until the short or over-load is emptied. The Arduino Uno has a resettable poly join that shields your PC's USB ports from shorts and over current. Yet most PCs give their own inside protection, the wire gives an extra layer of security. If more than 500 mA is associated with the USB port, the circuit will normally break the relationship until the short or over-trouble is emptied. It contains everything expected to help the microcontroller; essentially interface it to a PC with a USB connection or power it with an AC-to-DC connector or battery to start. The most extraordinary length and width of the Uno PCB are 2.7 and 2.1 inches independently, with the USB connector and power jack connecting past the past estimation. Four screw openings empower the board to be joined to a surface or case. The Arduino Uno can be controlled by methods for the USB affiliation or with an outside power supply. The power source is picked therefore.

### 6. Memory

The ATmega328 has 32 KB (with 0.5 KB utilized for the boot loader). It additionally has 2 KB of SRAM and 1 KB of EEPROM (which can be perused and composed with the EEPROM library).

Input and Output

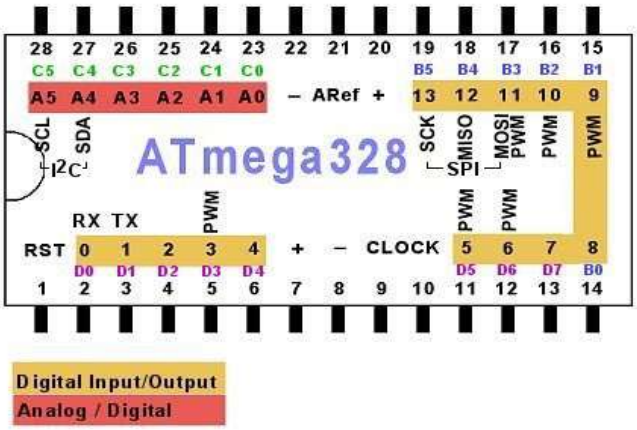


**Fig.4 ATmega 328**

Every one of the 14 advanced sticks on the Uno can be utilized as an info or yield, utilizing pinMode(), digitalWrite(), and digitalRead() capacities. They work at 5 volts. Each stick can give or get a limit of 40 mA and has an interior draw up resistor (detached as a matter of course) of 20-50 kOhms. Furthermore, a few pins have specific capacities.

### 7. Liquid Crystal Display

LCD (Liquid Crystal Display) screen is an electronic showcase module and locate a wide scope of uses. A 16x2 LCD show is extremely essential module and is regularly utilized in different gadgets and circuits. These modules are favored more than seven sections and other multi portion LEDs. The reasons being: LCDs are sparing; effortlessly programmable; have no impediment of showing extraordinary and even custom characters (not at all like in seven portions), movements, etc. A 16x2 LCD implies it can

show 16 characters for every line and there are 2 such lines. In this LCD each character is shown in 5x7 pixel lattice. This LCD has two registers, to be specific, Command and Data. The order enroll stores the direction guidelines given to the LCD. A direction is a guidance given to LCD to complete a predefined errand like introducing it, clearing its screen, setting the cursor position, controlling showcase and so on. The information enlist stores the information to be shown on the LCD. The information is the ASCII estimation of the character to be shown on the LCD.


**Fig.5 Liquid Crystal Display**

**8. GPS**

A GPS tracking unit is a device that used to determine the exact location of the person, vehicle or other assets. We get the location of the vehicle based on the latitude and longitude of the earth. The recorded data of the vehicle will be transmitted to the GPS receiver using satellite. GPS unit show the given information such as direction and speed calculated from the vehicle position changes. The receiver uses the data it receive to determine the transit time of each data and computes the distance to each satellite using the speed of light. The receiver receives a signal from each GPS receives also know as exact location in the sky. The GPS can found your position in three dimensions-east, north and altitude.

**9. GSM**

GSM stands for Global System for Mobile Communication. GSM produce an alternative to voice call as Short Message Service (SMS). The GSM modem convey the GPS parameter of the latitude and longitude values whenever the security mode is ON and Whenever there are varying values. The GSM network is split into three major systems: the switch system (SS) the bottom, station system (BSS), and also operation and network (OSS). GSM electronic equipment may be wireless electronic equipment that works with a GSM wireless grid. The most difference between the dial-up electronic equipment send the receives data through a set phone line whereas wireless electronic equipment sends receives data through radio wires.

## IV. RESULT

After successful implementation of Vehicle Tracking System we obtained following results: At checking side, at first client needs to perform Login movement. Login page appeared in Fig. 6 gives Login interface to the client. At the point when client will enter client name and secret key then framework will do approval to check whether the entered username and secret word is right or not. On the off chance that the entered username or secret phrase isn't right, framework gives a mistake message. Furthermore, on the off chance that it is right, client gets coordinated to next page with effective login.

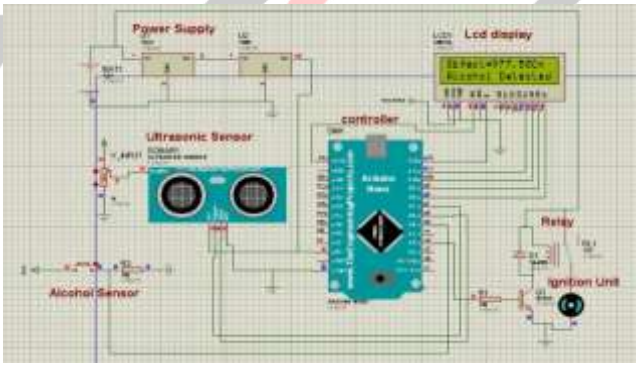


**Fig.6.Circuit**


**Fig.7 Android App**

## V. CONCLUSION

Thus the concept of vehicle black box system has been successfully completed. The system consists of two sensors which is placed around the vehicle. The arduino controller receives the communication from those tested sensors, which provides positive outputs. The regulation of sensors are controlled by raspberry pi and arduino which are functioning with each other and received data from the sensor has been stored in the SD card and it can be retrived whenever we require (in future). The recorded also from the video camera is the core data and it will be stored in SD card for further process. An emergency help system is pre-designed with the core unit to which can alert the system, It has been pre settled with the security module whenever accident happens. The system automatically send an alert message which is given by us as an input. Using vehicle tracking system we can easily know the reason for accident. Thus the encryption is successfully done.

## VI. ACKNOWLEDGMENT

The authors of this project would like to thank guide Assistant professor P.C.Siva Kumar and HOD Dr.S.Umamaheshwari for guiding the entire project. The completion of this project would have been impossible without the involvement and encouragement of my guide P.C.Siva Kumar.

## REFERENCES

[1] Mr .Manish Bhelande, Mr .Viraj Chaudhari, Mr. Prathamesh Gore, Mr. Raj Dhure, Abhishek Bhayye, “CAR BLACK BOX ” International journal of Advanced research in computer and communication Engineering, ISSN:2278-1021, Volume-05, Issue 3, March 2016 .

[2] Mr. Abdallah Kassem,Mr .Rabih Jabr,Mr. Ghady Salamouni,Mr .Ziad Khairallah Maalouf, “VEHICLE BLACK BOX SYSTEM” International system conference, April 2008 .

[3] Mr. Girish L.Deshmukh, Dr.S.P.Metkar, “RTOS BASED VECHILE TRACKING SYSTEM” International Conference on Information Processing, December 2015.

[4] Mr. Kontham Lavanya,Mrs.Y.Roji, “EVIDENCE COLLECTING SYSTEM FROM CAR BLACK BOX” International Journal of Advanced Research in Computer Engineering and Technology,Volume-03, Issue-10, October 2014.

[5] Mr. Ngo chon chet, “DESIGN OF BLACK BOX FOR MOVING VECHILE WARNING SYSTEM”, Student Conference on Research and Development, 2003.

[6] Ms. Monisha J Prasad, Ms. Arundathi S, Mr. Nayana Anil, Ms. Harshikha, “AUTOMOBILE BLACK BOX SYSTEM FOR ACCIDENT ANALYSIS” International Conference on Advances in Electronics, Computer and communications, 2014

[7] Ms. Prafulla U.P,Ms. Yuvashree G.S,Ms. Ramya Gowda,Ms. Rashmitha H.R, “BLACK BOX WITH INTELLIGENT VEHICLE SYSTEM” International Journal of Engineering Research and Technology, ISSN:2278-0181, 2017.

[8] Mr. Kazi Aaliya,Mr. Gantyala Supriya, Mr. Prabhutendolkar Mrunal, Mr. V.L.Salke, “WIRELESS BLACK BOX USING MEMS ACCELEROMETER FOR VEHICLE ACCIDENTAL MONITORING” International Journal of Innovative Research in Science, Engineering and Technology, ISSN:2319-8753, Volume-06, Issue-04, April 2017.

[9] Mr. B.Hari Kumar ,Mr. Syeda Fathima Tehseen, Mr. Thanveer, Mr .Guntha Vamshi Krishna, Mr. Syed Mohisin Akram, "VEHICLE MONITORING AND TRACKING SYSYTEM USING GPS ANS GSM TECHNOLOGIES" International Research Journal of Engineering and Technology, ISSN:2395-0056, Volume-03, Issue-04, April 2016.

[10] Mr.Ahmed Abdelrahman A.A, Mr.Ahmed Abdallah M.E, Mr.Mohammed Ali.H, Akram Mohammed A.A, "DESIGN AND IMPLEMENTATION OF VEHICLE TRACKING AND THEFT CONTROL SYSTEM", International Conference on Computing, Control, Networking, Electronics and Embedded Systems Engineering, ISSN: 978-1-4673, July 2015.

[11] Mr. Kishor Rane, Mr. Rahul Tichkule, Mr. Mohit Shinde, Prof. S.I. Nipanikar, "ONLINE BLACK BOX SYSTEM FOR CARS", International Journal of Engineering Science Invention, ISSN: 2319-6726, Volume 3, Issue 4, April 2014.

[12] Mr.Chanjin Kang, Mr. Seo Weon Heo, "INTELLIGENT SAFETY INFORMATION GATHERING SYSTEM USING A SMART BLACKBOX", IEEE International Conference on Consumer Electronics, ISSN: 978-1-5090-5544, September 2017.

[13] Mr.Salman Almishari, Mr.Prajna Dash, Mr.Kshirasagar Naik, "AN ENERGY EFFICIENT REAL-TIME VEHICLE TRACKING SYSTEM", Institute of Electrical and Electronics Engineers, August 2017.

[14] Mr.Mayuresh Desai, Mr.Arati Phadke, "INTERNET OF THINGS BASED VEHICLE MONITORING SYSTEM", Institute of Electrical and Electronics Engineers, July 2017.

[15] Mr.Fatin Balkis Binti Alzahri, Mr.Maziani Sabudin, "VEHICLE TRACKING DEVICE", Institute of Electrical and Electronics Engineers, May 2016.