

## Improved Version Of Smart Helmet To Eschew Road Accidents

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### Abstract

An accident is an unforeseeable and unplanned event. The avoidance of Traffic Rule and negligence are circumstances for occurrence of bike accidents which cause harm to human beings. Here carelessness plays a major role, regarding of this helmet usage is significant. So smart helmet make motorcycles driving is safer than before. From this work, the two-wheeler rider cannot start the bike without wearing the helmet. To eschew accidents, contrivance by using GSM and GPS technology. The functioning of smart helmet is very easy, Radio Switch is placed on the helmet is connected to Arduino with the help of wireless transmission. So, when the rider crashes then helmet send signal with the help of transmitter and receiver receives signal to Arduino, then by using GPS module. When the data increases beyond the minimum stress limit value then GSM module instantly send message to ambulance and registered mobile numbers. GPS module will identify and extract the location i.e., longitude and latitude point of the accident, the GPS data will give values, using these, which one can find the accident place and reached to that place accurately and help to overcome the severity. The alcohol sensor detects permissible level of alcohol, if person having alcohol more than permissible level then Arduino sent signal to GSM. GSM sent warning to the bike rider. After that, bike will automatically stop. Pollution sensor level is also available.

**Keywords:** smart helmet, GPS module, GSM module, Arduino, pollution sensor level

## I. Introduction

Progressively the bike accidents are escalating and may cause a huge loss of many human beings. According to a survey taken in India may conclude it as, almost 698 accidents occurring due to bike mishaps in every twelve months. In this, mainly not wearing the helmet is major reason for accidents and also there may be other reasons, like the biker has no appropriate knowledge about driving, no vigor of the bike, expeditious of bike, driving while intoxicated etc., and also befool are the major problems. Due to this, the person who undergo with wounded or the accident may not be responded immediately for the accident, and also it may cause liable and finally, at the end motorist involved in the mishaps are going to hurt. If these sudden incidents are taken place in any place, where absence of medicament in right time is one more and fore most cause for deaths. According to the look over in India 698 accidents take place per annum, just about half the wounded people die due to not attending the medicament in right time. Here many reasons come in to picture like late coming of hospital wagon, no one is there at the place of accident come about to give details regarding the accident happened at that time to the hospital wagon or parents [2].

With this we may notice that, in our daily life, especially for two-wheeler riders, it is crucial to rise a thought of identifying some solution to solve this difficulty. So, it is important to come up with a design i.e., giving the details about mishaps occurred in that place information to hospital wagon or parents as soon as possible and in time. Because intime reaction is crucial, by using this

design the persons who are going respond in time may stop loss and least we can save half the lives that are lost due to two-wheeler accidents.

Contemplate three paramount strands for keep away from catastrophe causes such as 1. One should wear the helmet mandatory. 2. steer clear of drunk and drive. 3. If a anyone met with an accident, at that place no one will help him or her. For that case, simply leaving or ignoring the person, who met with sudden mishap, he may pass away. In such circumstances, family members or hospital wagon drivers come know the information about the accident, then one can save his or her life to some extent [1] [5].

## II. Block Diagram

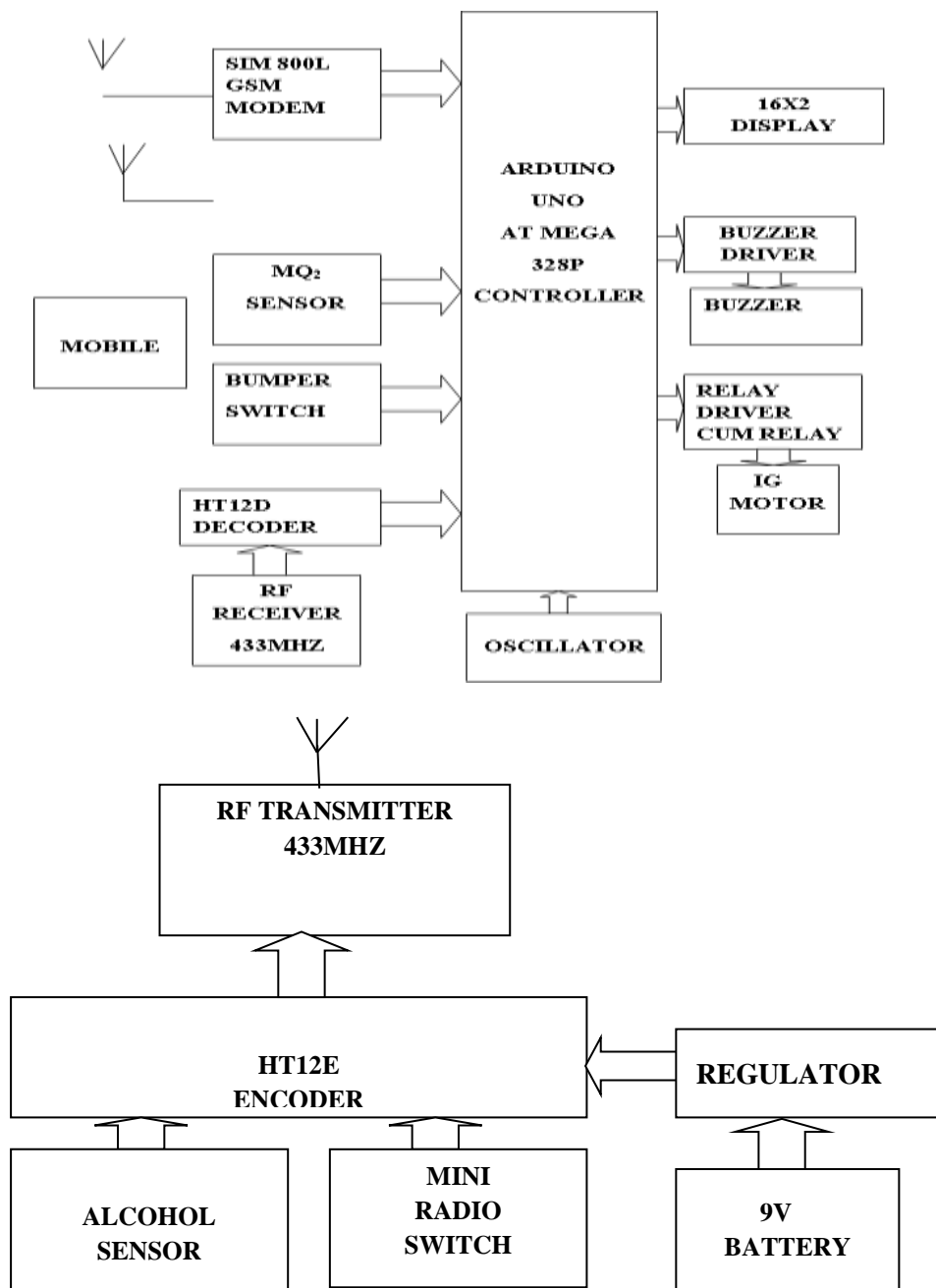


Fig.1 Block Diagram

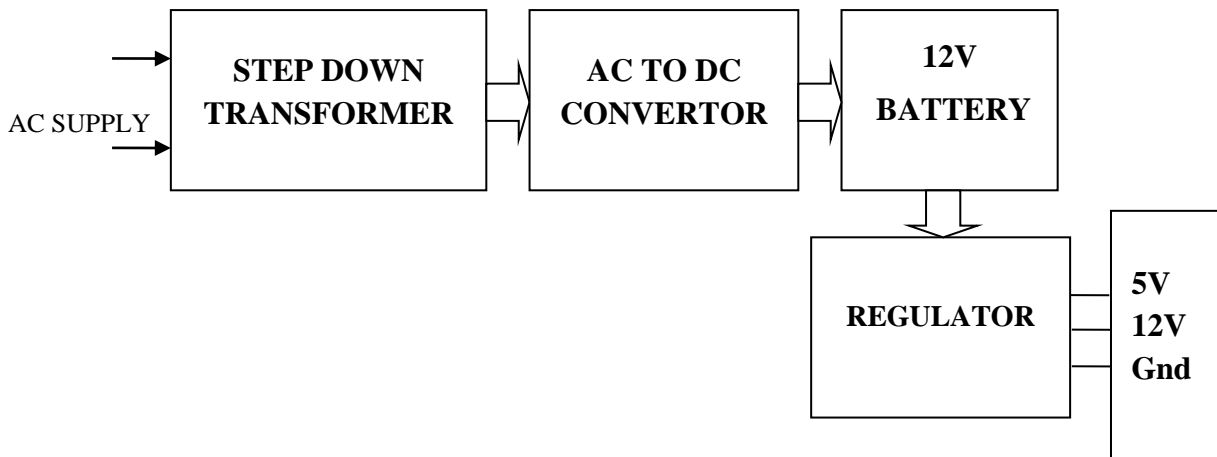


Fig. 2 Power Supply Block

All the components in this circuit use a 5v DC supply. A step-down transformer reduces the voltage level from 230V AC to 12V AC supply. This is voltage is then converted into DC using full wave center tapped rectifier. This dc voltage is used to recharge battery. IC7805 voltage regulator is used to maintain constant 5V DC.

#### A. BLOCK DIAGRAM DESCRIPTION

The block diagram is divided into two parts. First part is placed in the helmet consist of 9v battery, Regulator, 433 MHZ RF Transmitter, HT12E Encoder, MQ135 alcohol sensor, and second part is separate hardware kit consist of 12v battery, Arduino UNO at mega 328p microcontroller, HD12E Decoder, 433 MHZ RF Receiver, GSM module, GPS modem, Bumper switch, MQ2 Pollution sensor, 16\*2 LCD Display, Buzzer, relay.

The 9V battery supply is given to voltage regulator. IC7805 voltage regulator step down 9V to 5V. This +5v is given as supply to MQ135 alcohol sensor, HT12E Encoder, 433 MHZ RF Transmitter, helmet switch. MQ135 alcohol sensor estimates the amount of alcohol that is present in the helmet and its concentration range: 10-300 ppm. It is highly sensitive sophisticated and has fast response time and provides an analog output based on alcohol consumption. Encoder encodes data to the transmitter.

The transmitter is an electronic device used in telecommunications to produce radio waves in order to transmit data to the antenna. From the Rechargeable battery we get a constant dc supply of 12V. The 7805IC voltage regulator step-down 12V to 5V. This 5V is given as supply to the Arduino board, MQ2 Pollution sensor, HT12D Decoder, 433 MHZ RF Receiver, Bumper switch, 16\*2 LCD display, GSM and GPS modem, Buzzer, relay. Decoder decodes data through transmitter then sends to the receiver. A receiver is electronic equipment which pickups the desired signal and reject the unwanted signal. Pollution sensor is an instrument to measure carbon dioxide gas. A GSM digitalize and reduces the data then sends through a channel to the client data at a particular time slot. GPS can give precise and concise information that is used to measure speed, time, and exact location of person, where he or she met with mishap. One channel relay is considered to control high voltage, high current load such as motor, lamps. 16\*2 LCD display is an electronic display module and it can display 16 characters per line and there are 2 such lines and ARDUINO UNO used.

## II. CIRCUIT DIAGRAMS

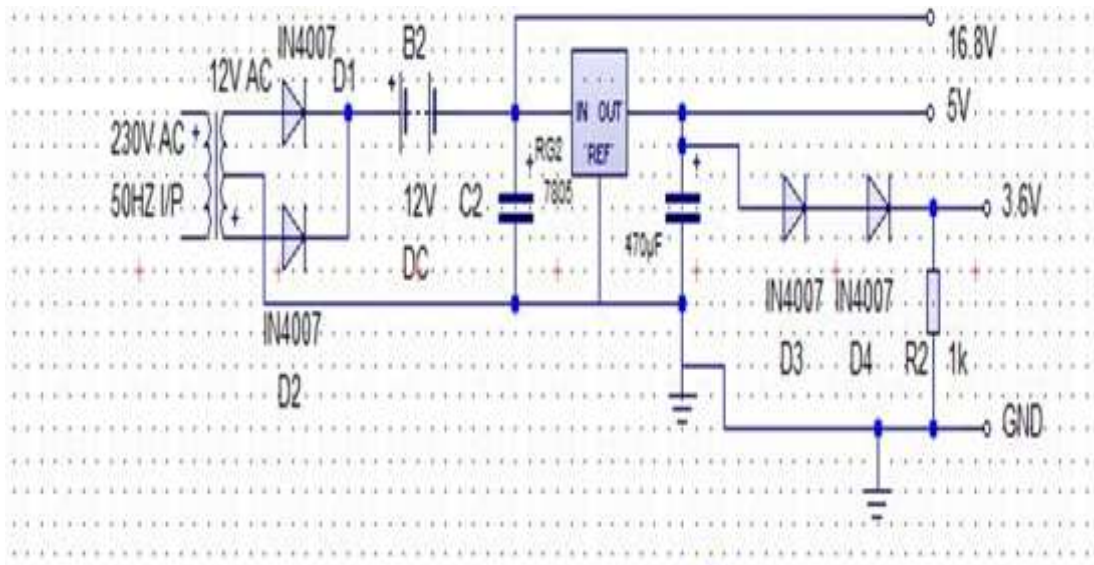


Fig.3 Power Supply Circuit Diagram

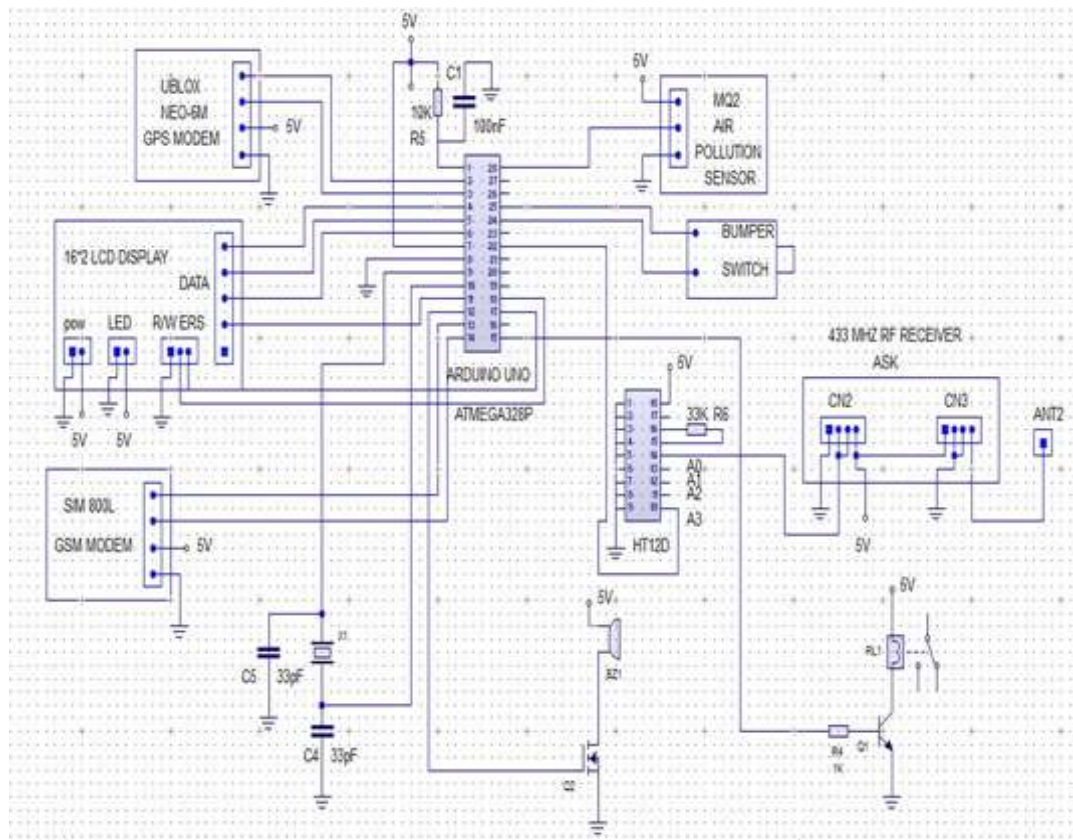


Fig.4 Main Circuit Diagram

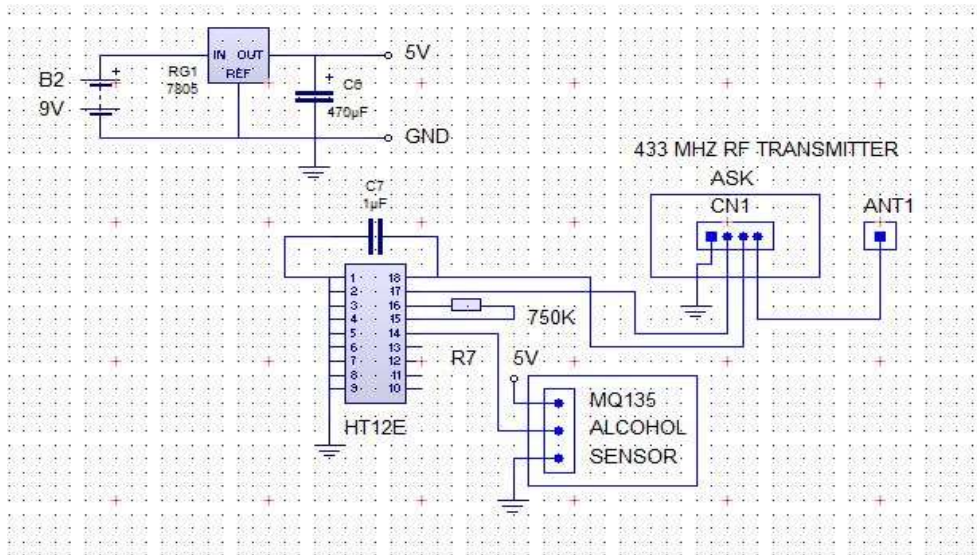


Fig .5 Alcohol Sensor

### A. WORKING

This system can be divided into two parts. One is under the helmet and another one is kit on bike. When the 230v ac supply is given to the kit then the step-down transformer steps down the voltage 230v to 12v ac supply and it converted into 12v pulsated dc supply by using full wave rectifier. Finally, capacitors will change pulsated dc supply to pure dc supply. A voltage regulator maintains +5v to entire system. For helmet part, we are giving 9v battery supply.

If the person is not wearing helmet, then the bike will not start and display show it “helmet not ok” with the help of transmitter and receiver. When the person wearing helmet, bike will start and display show it “helmet ok”. With the help of MQ135sensor, checking for whether the person drink alcohol or not [3][4]. If the person having alcohol the bike will not start and sends location and message to the concern numbers by using GSM and GPS [5]. Or else bike will start. After starting the bike, the pollution sensor MQ2 sensor will senses the pollution of the bike. If the pollution is more than permissible level then bike will not start and location will be sent to the concern numbers. After all of these, the bike will start. When the person meets with an accident the location of person will be detected by using GSM and GPS technologies and sends location and message to the concern numbers.

### III. PRACTICAL MODEL



Fig.6 Top view of the helmet



Fig.7 Top view of the kit

#### IV. OUTPUT PICTURES

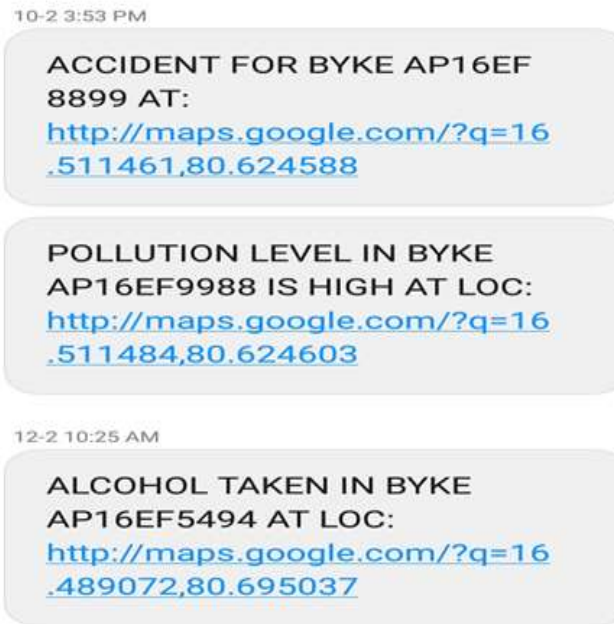


Fig. 8 Message sent through GSM

#### V. CONCLUSION

Improved version of smart helmet by using GSM and GPS is an eminent way to eschew road accidents for bike riders. This system gives extensive to rider wearing helmet all over the drive, should not under have the alcohol, checking the pollution level of bike and accident location tracking. This work helps the public is to reduce the mortality-rate caused by to failing to wear the safety helmet, driving two-wheeler by having aqua vitae and giving information to concern persons about the accident and location of the place and also the pollution rate of that bike is crucial. In accordance with this proposed system makes it mandatory for the bike rider to use this protective guard in order to drive a two-wheeler vehicle and ensures the safety of the human being and safe riding

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