Advanced Protection of Accident Prone Zones by Controlling Vehicle's Motor Speed

Harshit Raj[1], Jitendra Jamoriya[2], Bharat Lal Ahirwar[3], Mohd Kazim[4], Dr. Dharmendra Jain[5]

[1,2,3,4]*Student, Department of Mechanical Engineering, Madhav Institute of Technology and Science, Gwalior, Madhya Pradesh, India*
[5]*Assistant Professor, Department of Mechanical Engineering, Madhav Institute of Technology and Science, Gwalior, Madhya Pradesh, India*

---***---

Abstract - *Making an advanced technology for vehicles to protect the accidental zones was not easy even there are related reports already out there but out a team did best to solve the rest of the problem. As we will come to know about how the components function properly as per our requirement. These all is done by using the advanced electronics devices and programming's, our aim is to control the vehicle's speed by radio frequency modules indicating the driver so he could be ready to react when speed descends in zones without panicking. There are sensors installed for sensing the signals and indicating to the driver and even for the rear and front distance with the objects. The major thing which this project has is very much electronics and electrical knowledge's only to save lifes and after some of studies that we are here with our report of advanced protection of accident prone zones.*

*Key Words***:** RadioFrequency, Power Regulator, Transmitter, Receiver, Microcontroller, HT12E/D - Encoder/Decoder.

1.INTRODUCTION

In this project we are going to show how the speed is managed of any Automotive so that the speed of the automatic if controlled and does not extend the speed of car more than the higher limit.

Radio frequency transmitter send signal of code to the motor vehicle motor vehicle, the car is having the receiver which receives the signal coming from the transmitter and it can also modify the speed of the car as the limit is set.

During making of this project there are two circuits. One is transmitter and second is receiver circuit is receiver circuit. 89s52 controller is used in both the both the circuit receiver as well as in transmitter. There will be a presence of presence of LCD screen which will show alphabetic display numerical display for alphanumeric display on LCD of liquid crystal so that the speed is set and the speed of measuring device is controlled. There is a ht12d decoder which is in receiver, which receives signal and decode it to understand the microcontroller. There is a ht12e encoder inbuilt in transmitter which converts the data into signal forms and send it to the receivers.

We are using 12mhtz receiver as well as transmitter circuit. For vehicle in model we are using using DC motor.Ones we have set the limit (eg. 12) then the motor can not exceed that speed until it is changed.

Now we are using the varing resistance to vary in the speed of vehicle to control the car/vehicle.A LED light connected to microcontroller so that it blinks to alert driver on dashbord when the motor comes in contact with Radiofrequency.

Sensors are also installed at the front and back of the automobile and connected to micro-controller which indicates through led as programmed. The programmed addresses\data are transmitted together the header bits via an RadioFrequency or tends to an infrared transmission medium upon the receipt of the trigger signal.

2.MATERIAL REQUIRED

Table -1: Componets which are used

S. No.	Component name
1.	DC MOTORS
2.	DIODE
3.	LED
4.	VARIABLE RESISTANCE
5.	CAPACITOR
6.	LCD
7.	IC7805 P.R.
8.	MICRO-CONTROLLER AT89C52
9.	ENCODER/DECODER
10.	GEAR BOX
11.	SPEED CONTROLLER & ELECTIC CIRCUIT.

3. MATERIAL DESCRIPTION

3.1 Dc Motors

It was invented in 1821 by Michael Faraday. the permanent magnet is in the middle of pool of Mercury.

When the current is supplied then there is generation of magnetic field near armature and this cause the rotation of the shaft.
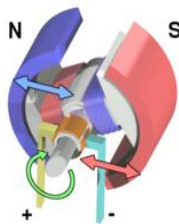

Fig:1- Rotation Of Dc Motor{4}

3.2 Diodes

This is used for the voltage regulator as well is signal limiter. PN junction is produced in this where p-type and n-type region is formed in the same structure and the place where +ve and -ve charges developed is known as depletion region.

3.3 LED

It is also a type of diode which can fall within PN junction. It gives us visible or invisible light when given energy to it.Process of light giving by applying electrical sources of energy is known as electroluminescence.

3.4 VARIABLE RESISTANCE

In a simple words it is a barrier to the current path,which controls the flow of current as per the requirement so to perform the system function better way. Even the resistance can be changed as need of current supply is increased or decreased.

3.5 CAPACITOR

It is a device used for the storage of electric charges. It have two plates which is separated by dielectric material .

Commonly the capacitors are of two types

- ceramic capacitor

- electrolytic capacitor

3.6 LCD

Liquid Cristal Display is the most thin display screen which shows the function and the output in the visual form. it uses very less electricity power and consists of color filter, horizontal filter, crystal molecule, vertical filter.
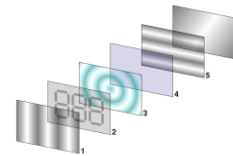

Fig:2- Structure Of LCD{5}

3.7 IC7805 P.R.

IC7805 is for the regulation of voltage we use and is also known as power regulator.

This integrated circuit tends to maintain the output of voltage at a constant value. This IC7805 tends to give +5volt regulated supply.
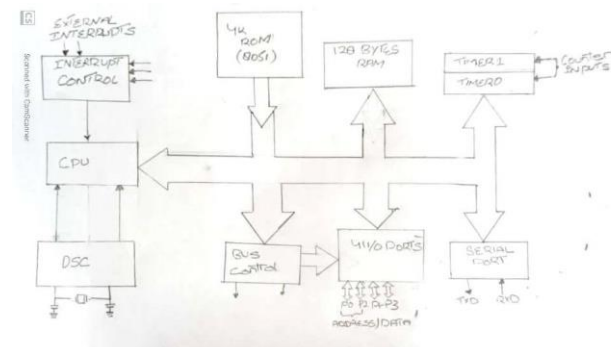
3.8 MICRO-CONTROLLER AT89C52

Fig:3- Architecture Of 8051

Characteristics -

- 14 KB of in system is tend to reprogrammable flash memory

- can write or erase 100 cycles easily

- static oper. - 0Hz to 24Mega Hz

- serial channel programmable in the circuit

- power down modes as well as low power idle

- RAM is of 128 X 8 - internally.

- it is a low powered and high performance CMOS 1byte microcontroller with 4kb flash p e r o m.

Pins we are using are - VCC, GND, Port 0-3, RST, ALE / PROG, PSEN, FA / VPP, XTAL1, XTAL2.

3.9 Encoder/Decoder

The basic function of encoder IC ht12e is to encode the written program into the form of signals and function of the decoder IC ht12d is to convert this signal forms which it is getting into the data or language which microcontroller can easily understand. these are designed by h o l t e k and we are able to use a 18pin version of encoder and decoder integrated circuit.
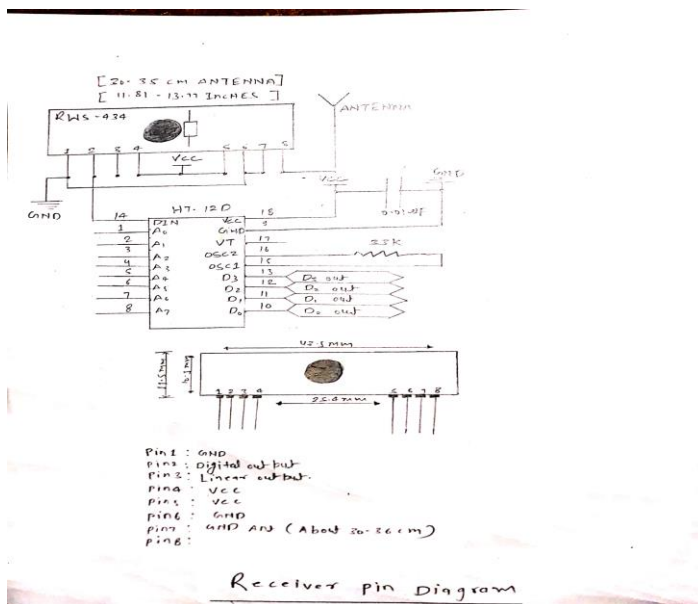

Fig:4- Receiver Pin Diagram

3.10 Gear Box

A gear box is an important part of the vehicle the main purpose of the gear box is change the speed of the car high speed to low speed and vice-versa.

When the input shaft is running at the high rpm then the output shaft running at the low speed with the help of gear the gear will change the speed of the shaft and increase the torque.The other work of the gear is change the direction of the motion when shaft is running at horizontal direction then with the help of gear we can change horizontal direction to vertical direction.

There are many uses of gear is reduce the speed and vice-versa and also increase the torque .there are many types of gear and different gear are used in different place .For high torque we use spur gear and there are many other type of gears warm gear, rack and pinion gear, helical gear etc.

3.11 Speed Controller & Electric Circuit

Motor rotation can be easily controlled by fluctuation for regulating voltage and current our team has taken voltage controlled by a rotary switch which can be controlled mechanically by two gear wires.

4.WORKING DESCRIPTION

In the model of the project we tend to use a motor driver IC to manage the input resistor values. A Liquid Cristal Display screen is to be kept and connected in micro-controller port P1.Motor drives the input voltage and deliver to the microcontroller. Input resistance eventually varies to 5V DC. Once the input voltage is varied then input voltage in microcontroller coverts the HEX Data in ASCII code and display into the screen(i.e.LCD) module.

Micro-controller gets the value data and remember it by saving it into RAM of microcontroller.Module repeatedly varying the speed of DC motor with the help of fluctuating duty cycle.

The micro-controller continues the sending and reserving of the data and compare the speed value of car and the speed values set by us when it finds that the value is matched then immediately it stops the increasing of speed of car DC motor.

The main function of the model is the transmitter circuit , we tend to use it to transfer data in the form of radio Frequency serially . During making of project we tend to use the 12Mhtz freq. module.
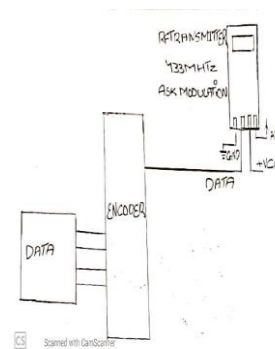

Fig:5- Flowchart Of Transmitter

Encoder IC is used for sending the data and it also converts the parallel data into serial data. This type of data is easy to transmit by Rf. module in atmosphere/air. We tend to use DIP switches for selection of data. Encoder ic HT12E is used to convert the parallel data into serial data .
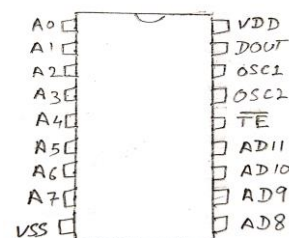

Fig:6- Pin Diagram Of Encoder

Pin No. 10, 11, 12, 13 is data insertion pin. Pin no 1- 8 is address pin. Pin No. 9 is grnd pin. . We provide a 0 bit on the entire address pin,which is not much necessary and the address pin is selected as we require them.

We tend control the pin no 14 by connecting a Pin No. 14 to ground pin, because when this is ground then only the data can be send to the IC. Pin 15 and 16 is known as oscillator pin of encoder IC, 1M Ohm resistor is connected to this pin. Pin 17 is output data pin, data from the pin is connected to the input transmitter.

Data receive by the receiver receiver is in the form of radio frequency of radio frequency radio frequency. The receiver receives the receives the data and the decoder decodes the serial signals into parallel data then it is sent to the microcontroller and therefore the further work is preceded as programmed. Then and the microcontroller controls the function off the motor as well as indicator LED which is which is indicator LED which is which is placed on the on the dashboard of the vehicle to alert the driver.
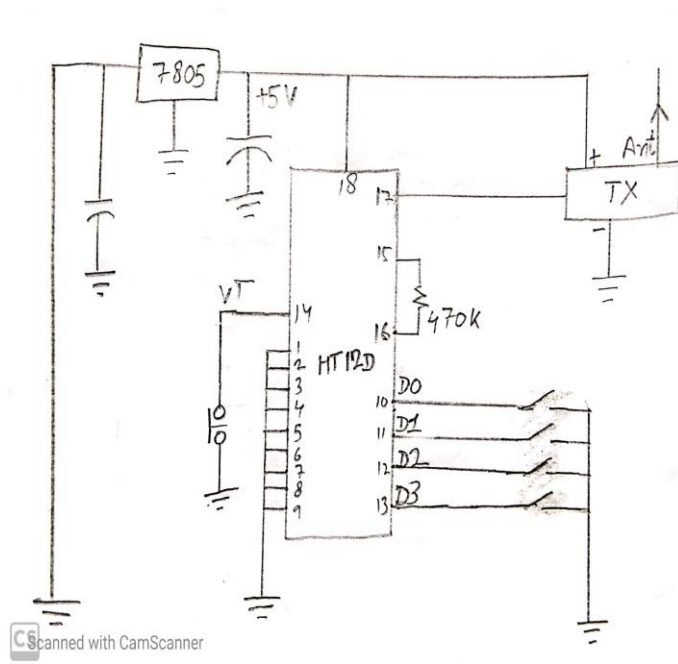
5. CIRCUIT DIAGRAM
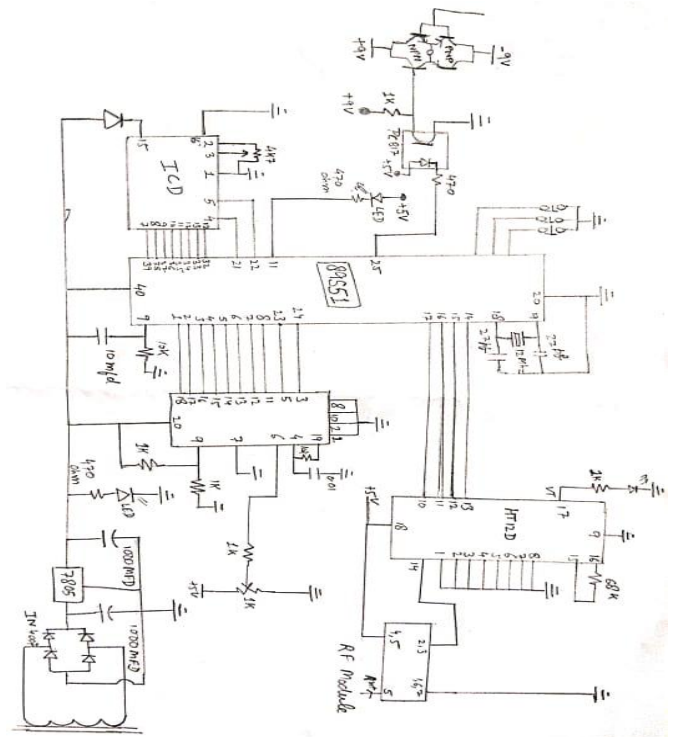

Fig:7- The **Transmitter** Circuit Diagram

Fig:8- **Receiver** Circuit

3. CONCLUSIONS

The conclusion is that we tend to set a speed value of vehicle according to our or area requirement. As we select the one upper limit and fix, then the vehicle cannot achieve a speed more than that.

All this control done pragrammically, the vehicle receiver will receive the code then it will talley the set speed and current speed of the car, if the car exceeds maximum speed, our system will automatically slow it down.

In recent days the Engineers or Researchers are in progress to develop faster relays using modern technique and many digital distance relaying have been derived.

At the end of the day it will make travelling safer.

REFERENCES

[1]   Electronics Book of A.K. Maini and Gupta &Kumar.

[2]   Amit Sohara From Techbrief worked on speed control by bluetoth in 2011.(SCIENTIST)

[3]   R.F. Circuit design book of Howard W. Sams in 1982.

[4]   https://apsstudy.weebly.com/electricity.html

[5]   https://en.m.wikipedia.org/wiki/Liquid-crystal_display