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AN ADVANCED ROBOTIC CAR FOR ACCIDENTAL PREVENTIONS

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ABSTRACT:
As accidents have been a common routine on roads these days, it has become necessary to take measures that not only save lives but can help people to prevent accidents. One of the major reasons for accidents is over speed. Over speed is a condition in which an engine is allowed or forced to turn beyond its design limit. The consequences of running an engine too fast vary by engine type and model and depend upon several factors, chief amongst them the duration of the over speed and by the speed attained. With some engines even a momentary over speed can result in greatly reduced engine life or even catastrophic failure. An intelligent car [1] is developed by using RF module [2] so that the speed of the vehicle could not be exceeded even on accelerating in a particular zone like schools, hospitals, etc.

KEYWORDS: Intelligent car, rf module, engine type , catastrophic

INTRODUCTION:
The research paper aims to show that how one can control the speed of any car up to a set value. Once the upper limit is set then it is not possible to increase the speed of a vehicle .As the car receives a code signal then car maximum speed limit is set. Now car driver cannot exceed the speed limit. As the car is out of range then car speed can be changed.
The use of 8051 controller with ADC and LCD display, displays the set value of speed and speed of accelerometer that keeps on changing. For a vehicle we use small DC gear motor. The variable resistor is used to change the value of accelerometer [3]. This variable resistor is connected to the input of ADC circuit. Varying the variable resistor speed of motor changes.
0804 ADC (8 bit) checks the value of input resistor. Output of the ADC is connected to the microcontroller port p1. ADC converts the input voltage and delivers to the microcontroller. When we vary the input voltage then ADC converts the input voltage to the Digital voltage. Output of ADC is hex code, microcontroller coverts the hex data in ASCII code [4] and display into the LCD module. Microcontroller gets the value and save the same in the RAM content of the microcontroller. Controller continues vary the output of the DC motor via varying the duty cycle. Controller compares the change with the set value .When input value is equal to the set value then microcontroller stop to increasing the speed of the DC motor.
5 volt regulated supply is given to the LCD display. 7805 regulator is connected with filter capacitor [5] to provide a ripple free regulated voltage to controller, optocoupler and LCD display. As soon as the power supply is given to the 8051 it doesn't start. We need to restart for the microcontroller to start. Crystals provide the synchronization [6] of the internal function and to the peripherals. When using crystals we need to put the capacitor behind it to make it free from noise.

Microcontroller (8051):
Features:-
Low Power, High Performance CMOS 8 bit microcomputer.

Low power idle and power down modes.
32 programmable I/O lines.
256 X 8 bit internal memory.

1.8-bit CPU.(Consisting of the 'A' and 'B' registers)
Most of the transactions within the microcontroller are carried out through the 'A' register, also known as the Accumulator. In addition all arithmetic functions are carried out generally in the 'A' register. There is another register known as the 'B' register, which is used exclusively for multiplication and division

2. 4K on-chip ROM
The size of the program you write is bound to vary depending on the application, and the number of lines. The 8051 microcontroller gives you space to load up to 4K of program size into the internal ROM.

3. 128 bytes on-chip RAM
This is the space provided for executing the program in terms of moving data, storing data etc.

4. 32 I/O lines. (Four- 8 bit ports, labeled P0, P1, P2, P3)
Port 1 would have 8 bits. There are a total of four ports named p0, p1, p2 and p3 giving a total of 32 lines. These lines can be used both as input or output.

5. Two 16 bit timers / counters.
A microcontroller normally executes one instruction at a time. However certain applications would require that some event has to be tracked independent of the main program.
The solution is to have two timers. These timers execute in the background independent of the main program. Once the required time has been reached, we can trigger a branch in the main program.
These timers can also be used as counters, so that they can count the number of events, and on reaching the required count, can cause a branch in the main program.

6. Full Duplex serial data receiver / transmitter.
The 8051 microcontroller is capable of communicating with external devices like the PC etc. Here data is sent in the form of bytes, at predefined speeds, also known as baud rates.
The transmission is serial, in the sense, **one bit at a time**

7. 5- interrupt sources with two priority levels (Two external and three internal)
The timers can trigger a branch in the main program. However, in this case we would like the microcontroller to take the branch, and then return back to the main program, without having to constantly check whether the required time / count has been reached or not.
This is where the interrupts come into play. These can be set to either the timers, or to some external events. Whenever the background program has reached the required criteria in terms of time or count or an external event, the branch is taken, and on completion of the branch, the control returns to the main program. Priority levels indicate which interrupt is more important, and needs to be executed first in case two interrupts occur at the same time.

8. On-chip clock oscillator.
This represents the oscillator circuits within the microcontroller. Thus the hardware is reduced to just simply connecting an external crystal, to achieve the required pulsing rate.

ADC (0804):
Features:-
It takes the input from variable resistor.
Analog signal gets converted to digital signal.

The output is in form of hex code.
The output is given to the LCD.

LCD:

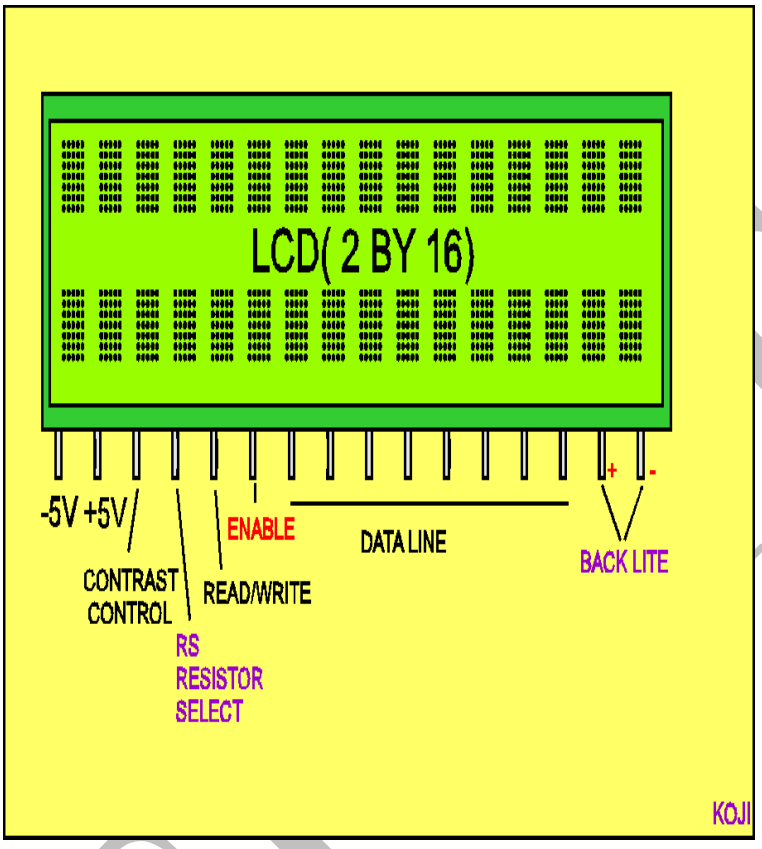

Fig.1 LCD

Features:--
It is 2 by 16 matrix.
It shows the set value and current speed value.

Encoder & Decoder:
Features:-
Encoder converts data parallel to serial.
This data is send is transmitted by rf module.
Decoder converts data to parallel.
The receiver decodes the output.

RF Module:

A.TRANSMITTER SECTION OF RF MODULE
The transmitter module will be RF sensor module which will be placed in the area where we want to control the speed of the vehicles or in the speed limiting zones.

B.RECEIVER SECTION OF RF MODULE

The receiver module is an RF receiver module which is placed inside the car. This module detects the speed controlled zone as soon as the car enters the area where speed limit is set, this receives the data sent by the transmitter and aids in control of the speed of the car by further sending the data to the microcontroller.

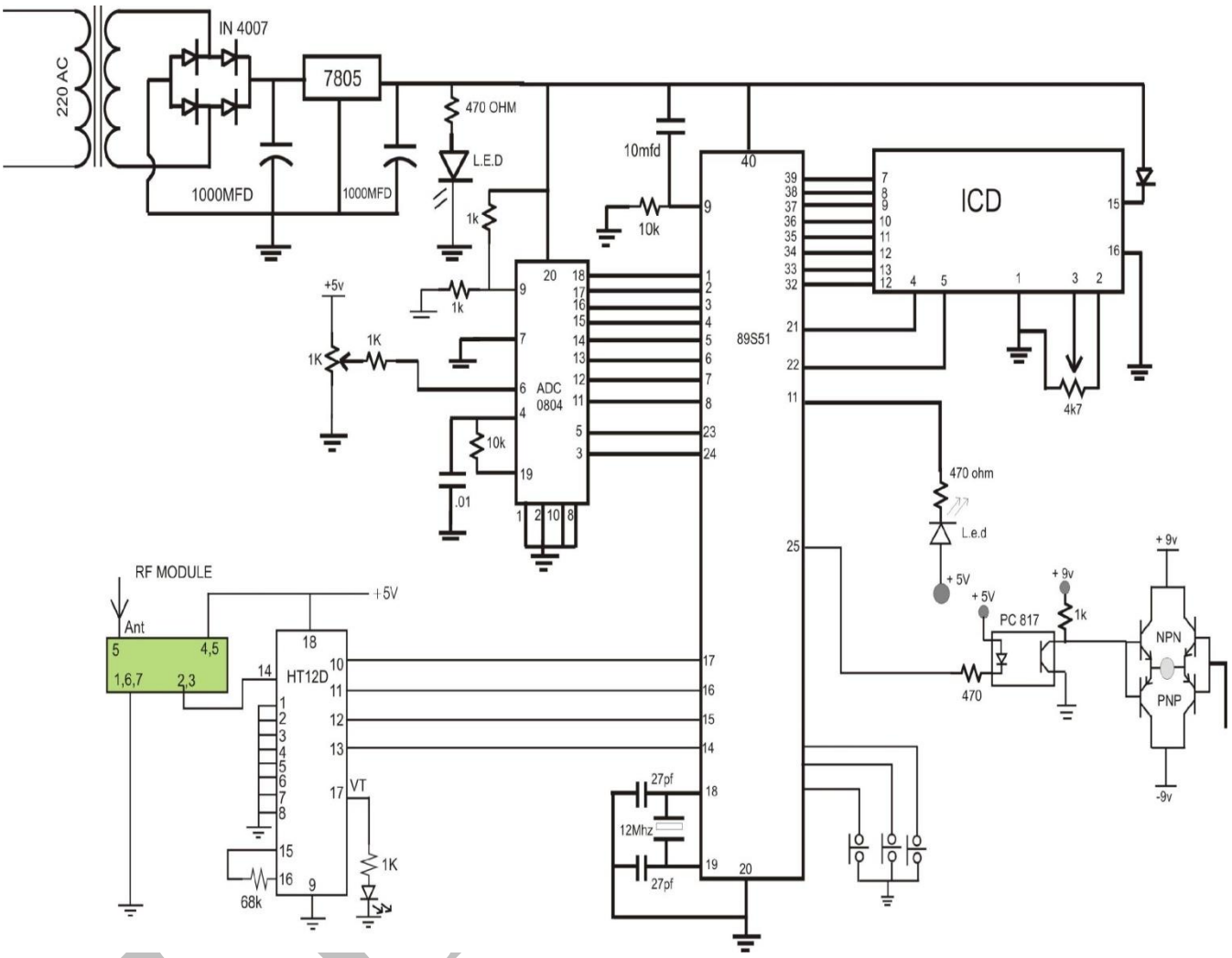

Fig.2 **Circuit Diagram for Speed Control**

BENEFITS TO USER:
Ultra low power consumption
Easy and fast to install
Superior urban canyon performance
Low cost with high performance

APPLICATIONS:
It prevents accidents at places like schools and hospitals.
It is used for sports and recreation.

It prevents accidents at hilly areas.

CONCLUSION:

Speed is the main reason behind accidents. A 5% increase in average speed leads to an approximately 10% increase in
crashes that cause injuries and a 20% increase in fatal crashes. Zones of 30 kmph can reduce crash risk and injury severity and are recommended in areas where vulnerable road users are particularly at risk Here by we, conclude that this project is very easy to implement on current system and the current type of technology available, low cost and durability, ensures maximum safety to passengers and public, saving their crucial time, the driver gets all information about the road without distracting him from driving, driver gets all information even in bad weather conditions, low power consumption. This project is further enhanced by automatic speed control when the vehicles get any hazard signal from outside environment.
Through research presented in this paper, we propose an intelligent car system for accident prevention and making the world a much better and safe place to live.

REFERENCES:

1. M. Bertozzi "Self-steering Mars Rover tested at ESO's Paranal Observatory". ESO Announcement. Retrieved 21 June 2012.
2. F. Egan, William (2003).Practical RF System Design . Wiley-IEEE Press. ISBN 978-0-471-20023-9.
3. Broggi, M. Bertozzi, A. Fascioli, and G. Conte,Automatic Vehicle Guidance: The Experience of the ARGO Autonomous Vehicle. Singapore: World Scientific, 1999.
4. A. Broggi, A. Fascioli, C. G. Lo Bianco, and A. Piazzi, "The ARGO autonomous vehicle's vision and control systems,"Int.J.Intell.Control syst., vol. 3, no. 4, pp. 409–441, 1999.
5. C. Thorpe, J.D. Carlson, D. Duggins, J. Gowdy, R. MacLachlan, C. Mertz, A. Suppe, and C. Wan, "Safe robot driving in cluttered environments," 11 International Syposium of Robotics Research, 2003. G. Hegeman, "Overtaking os frequency and advanced driver assistance systems," in Proc. IEEE Intell. Vehicles Symp., Parma, Italy: Univ. Parma, 2004, pp. 145–149.
6. S. Tsugawa, T. Yatabe, T. Hirose, and S. Matsumoto, "An automobile with artificial intelligence," in Proc. 6th IJCAI, Tokyo, Japan, 1979, pp. 893–895.