VEHICLE SPEED CHECKERS AND AUTOMATIC SPEED REDUCTION FOR HIGHWAYS

Ridhika Chopra[1], Sidhika Chopra[2], Namrata Dangat[3], Sayli kokare[4]
Dept of Electronics Engineering
KCCEMSR
Thane, India
[1]ridhikachopra@gmail.com, [2]sidhikachopra@yahoo.com, [3]namratadangat028@gmail.com,
[4]saylikokare2393@gmail.com

***Abstract*- While driving on highways, motorists should not exceed the maximum speed limit permitted for the vehicle. However, conditions keep occurring due to speed violations since the drivers tend to ignore their speedometers. This speed checker will come handy for the highway traffic police as it will not only provide a digital display in accordance with a vehicle's speed but also reduce the speed if the vehicle exceeds the permissible speed for the highway.**

I. INTRODUCTION

The motor vehicle environment has gone virtually untouched by the technology explosion of the past decade - especially the computer revolution. Except for the use of microprocessors as an adjunct to pollution control and engine management; technology has, for the most part, not effected the roadway environment - automated traffic lights notwithstanding. Each year there are thousands of highway deaths and tens of thousands of serious injuries due to "Run-Off-Road" accidents. Everything from simple driver inattentiveness, to fatigue, to driving-while-impaired, are responsible.

The cost to the nation is the thousands of lives lost, and tens of millions of rupees. This is a much more common cause of single vehicle fatalities than is generally thought. The high profile multiple vehicle accidents--including large "eighteen wheelers," capture the headlines. One very effective prevention to this needless carnage, is the installation of so-called, "SPEED SENSOR" along the roadway edge. SPEED SENSOR are deeply inserted in road, they transmit the maximum speed limit signal by Radio frequency waves .uC compares signal from road speed limit signal with actual speed signal of car ,If vehicle speed is more then speed limit signal generated from sensor embedded in road, then initially alarm is given & then automatic brake is applied. In all but the most impaired driver, the response is imminent and Life Saving! The long dreamed of, "Smart Highway," has not only been technically feasible for some time, but its time may be now. To enlist the vehicle's existing computer for the added tasks involved in vehicle/highway interface management, will put great computing power at the disposal of the entire IVHS structure. There are two approaches: one would have smart vehicles operating autonomously, with minimal centralized control or supervision; the other approach would be an integrated tightly-coupled vehicle/highway interface. This latter approach is composed of three elements: the "smart" vehicle, the centralized authority or "network" and the communication between them. The resulting homogeneity would strengthen any and all functions taken on by such a system: it would be an entity that is greater than the sum of its parts. Surplus computing

power would always be available, improving data access and distribution; and speed in evaluation and decision making (e.g., expert systems).

The various communications methods that might be brought to bear on such a system all have their individual strengths and weaknesses: there seems to be no single technology that has it all. However, among the contenders, the RF-wave, approach appears to have the greatest advantages. By the time the intelligent vehicle highway system, IVHS, starts to show up in those urban areas where it is most needed, the motoring public - both commercial and private - will not only except it, they will, most likely, welcome it.

II. PROBLEM STATEMENT

(Efficiency and range: Numerous external factors influence energy)

An intelligent vehicle equipped with car-to-x technology is aware of necessary braking or acceleration manoeuvres in advance because it combines navigational data with information about the flow of traffic, for example. The central computer can prevent driver actions that would use energy unnecessarily or use targeted braking for recuperation of the battery. A vehicle has spun out on a slippery road in a blind curve and is unable to free itself under its own power. At the same time, other vehicles are approaching quickly. The stuck vehicle uses car-to-x to send out a warning signal reporting the precise location of the hazardous location. A corresponding warning then appears on the navigation system display of the approaching cars.

Example 1 – Traffic flow: Many cars are travelling between traffic lights on an arterial road. Over and over again, they accelerate only to have to brake again when the traffic light changes to red. Car-to-x technology enables them to establish a network between themselves and receive information from the traffic light controller. The drivers can then make more judicious use of the gas pedal because they know what to expect. The same applies for imminent traffic jams: cars ahead provide information that results in adjustments to the posted speed limits, noticeably spreading out the traffic.

Example 2 – Convenience: The driver has entered a shopping centre with a chronic shortage of parking spaces into his navigation system as the destination. With car-to-x, the mobile system networks with the parking space registration system at the destination. When the system in the parking garage reports that a convenient parking spot is available, the navigation system can register its location and also reserve the spot.

III. LITERATURE SURVEY

Vehicle technology has increased rapidly in recent years, particularly in relation to breaking systems and sensing systems. The wide spread introduction of antilock breaking system(ABS) has provided the building blocks for a wide variety of breaking control systems. Additional hardware that allows break pressure to be increased above pedal, demand as well as to be reduced, combined with additional software control algorithms and sensors allow tracktion control(TC), electronic break force distribution(EBD), break assist (BA) and electronic stability control functions to be added. In parallel to the development of breaking technology, sensors have been developed that are capable of detecting physical obstacles, other vehicles or pedestrian around the vehicle, many luxury, mid size and small cars in Europe and in japan even very small cars, are now fitted with an adaptive cruiz control system that is capable of measuring and maintaining a driver preset headway to the vehicles ahead by automatic modulation of engine control, and it requires automatically by supplying breaks upto a maximum de-acceleration of 0.3g. if no vehicle is ahead, the vehicle maintains the desired set speed, Acc can be ordered as an option for new vehicle.

IV. PROPOSED SYSTEM

The evaluation system involved speed checking provided with an alarm of over speed detected by the sensors and a signal sent by the transmitter to the receiver in the car and the driver was only adviced to reduce the speed manually, also no control was seen in the reduction of speed by the driver as per his wish. Also no control was made in the speed of drunk driving thereby increasing accidents. Use of horn increased to various health problems such as noisy areas, mental disturbance, and hearing aid in prohibited areas such as hospitals which require complete isolation from noisy areas, this factor of providing automatic speed reduction was not included earlier. Since most drivers disobey the law of traffic by breaking signals, automatic stopping within the range of signal was not provided. Henceforth to avoid all the above drawbacks we have overcome with the following conclusion and improvements.

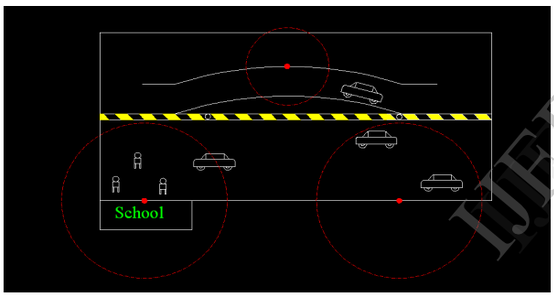
V. EXISTING SYSTEM

The existing system of automated automotive speed reduction has major advancement of reducing speed automatically if the driver increases the specified speed limit. This system senses the speed of the car and if the car speed is over limit the sensor transmits a signal to the receiver in the car which sends this signal to the microcontroller used , the microcontroller will then reduce the voltage supplied to the ECU (engine controlled unit), this will automatically reduce the voltage supply to the motor and hence reduce the speed of the car automatically. Also it includes an additional feature of NO HORN in horn prohibited areas such as school, hospitals, etc. Major advancement is to control the speed of the car if the driver is drunk; this is done by the alcohol sensor included inside. Thus we can reduce the speed of the car by various features thereby reducing accidents to great extent and saving lives.

VI. PROJECT MAIN FEATURES

A. Vehicle speed control in variable zone

In this Feature we can control the speed of vehicle in different type location, such as Flyover bridge, school area, college campus, courts, highway, cities internal area.

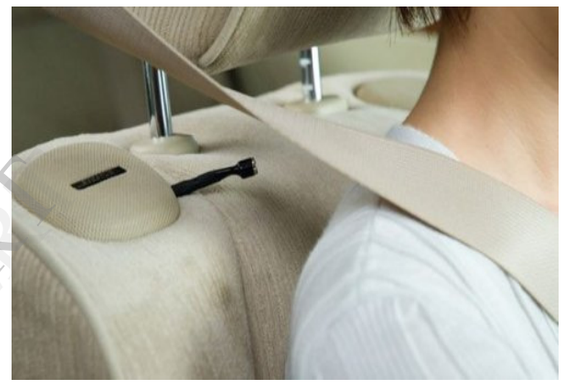


B. Horn control of vehicles

In this feature we can control the unwanted horn Disturbances in horn prohibited area like School , collage ,Court area, all type hospitals, kids nursery's, Public libraries, Offices, public places.

C. Alcohol control

In this feature we can control all accidents of vehicle by happing because of " Drink and Drive " When Driver Start the vehicle then the System check the alcohol level of driver, if it sensed then the car engine not started that time. If it's sense nothing then the system allows them to start the engine.



D. Red traffic light control

In this feature we can control the vehicle on traffic signal, when traffic signal is red then the vehicle automatic stopped by this feature**.**

VII. BLOCK DIAGRAM

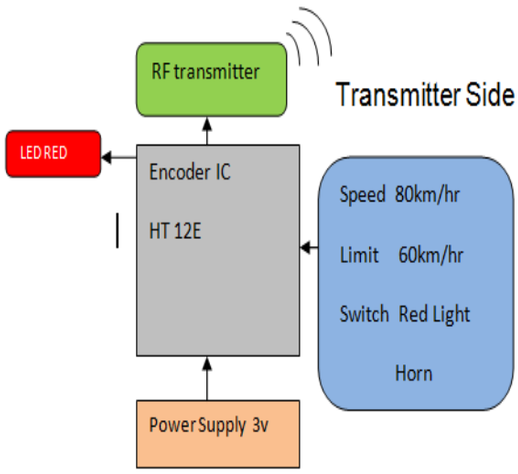


Fig: Transmitter block diagram

B. Receiver

On receiver side the data is received by RF receiver module of 433 MHz. This demodulated signal is fed to decoder for further decoding. If address send from encoder IC GND matches with decoder address then valid tone (VT) signal on decoder goes high, which indicates receives signal. The decoded by decoder is fed to uC for further control of relay. uC requires mainly three things for operation. Which are power supply clock & reset. Power supply provided to uC is +5v & GND on pin40 &pin20 respectively. On osc pin18 &19,a crystal oscillator is connected which generates clock for program execution for reset on pin9 & 10k resistor &10k capacitor is connect which reset controller on power up. Controller receives data from decoder & after decoding of commands it gives proper command to relay driver IC ULN2803, which amplifies signal coming from controller & controls as per controller instruction. Relay used of 12v, 400ohms SPDT type. For making motor on/off single relay is required for changing direction of motor two relays are required .direction of motor can be changed by changing the direction of supply of motor.

The circuit is divided into two parts:

A. Transmitter

For transmitter section, the different commands signals are transmitted via RF transmitter module of 433 MHz. it has 4 pins of antenna, Vcc, Gnd, & serial data input. Antenna, +5v & Gnd are connected to respective places and serial data input is generated from encoder IC HT12E. This encoder IC's function is to convert parallel data into serial data address lines of encoder are grounded because they are not used. Data lines are fed with command signals since four lines are available 16 different commands can be generated. The output modulating frequency is decided by resistor connected at OSC pin of the encoder. Currently because of 1.2Mohms resistor, It is 30 KHz. The output of encoder is fed to RF transmitter module is currently is roughly 100sqm.

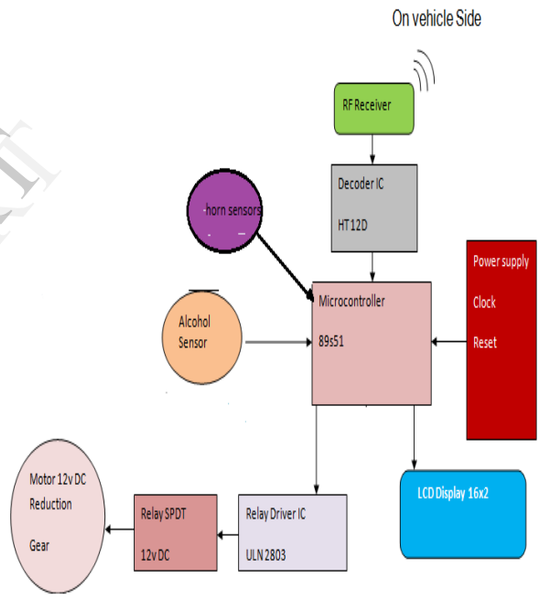


Fig: Receiver block diagram

REFERENCES

[1.] Power supplies : http://www.electronics-tutorials.com/basics/power-supply.htm
[2.] Microcontrollers: http://www.engineersgarage.com/electronic-components/at89c51-microcontroller-datasheet
[3.] Links to sites of interest in electronics: http://www.electronics-tutorials.com/links/links.htm
[4.] Links to tutorials on receivers: http://www.electronics-tutorials.com/receivers/receivers.htm
[5.] Links to web sites that show how to build test equipment projects: http://www.electronics-tutorials.com/test-equip/test-equip.htm
[6.] http://www.smpstech.com/aids.htm Links to design aids for power supply design.
[7.] AM/FM/SW active antenna: http://www.ee.washington.edu/circuit_archive/circuits/activeant.html
[8.] http://digitallibrary.srmuniv.ac.in/dspace/bitstream/123456789/566/1/2947.pdf