

# VEHICLE ASSISTANCE SYSTEM

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## ABSTRACT

*The amount of personalized transportation is increasing day by day. Most of the cars or cabs are running on the road with an average speed and window glass fully covered. This makes the driver unintended to the external noise as well as horn from the rear side vehicle, this may lead to accident conditions as driver may be unknown to the car's rear side. However this system will develop a communicative channel between several automobiles running on the same path. The vehicles will be interconnected or receive an alert signal once they are in the region of another vehicle. The system will operate on microcontroller which will monitor the vehicle's surrounding. Each vehicle unit will be loaded with the receiver as well as transmitter which will make the desired functions. This system will help to prevent damage to the car, saving life of driver and passenger etc.*

**KEYWORDS:** Vehicle, Monitor, accident.

## I. Introduction

The goal of Vehicle assistance system is to prevent accident by allowing vehicles transit to send position and speed data. Depending upon how the technology is implemented, the vehicle's driver may simply receive a warning that there will be a risk of an accident or the vehicle itself may take actions such as braking to stop. A concept of a Vehicle assistance system based on spread spectrum technique-SS communication radar. By exploiting the spread-spectrum technique, the system was capable of transmitting data and measuring the range between Vehicle and obstacles simultaneously, and its theoretical validity was proved using a computer simulation.

In this work, we can use microcontroller unit consist of AVR ATMEGA328 from AVR family or AT89S52 from MCU8051 Family as a main controlling core. Basically system is based on the embedded platform in which multiple sensors are actuators are connected to the system. Ultrasonic transmitter and receiver pair acts as a primary sensors in the system to transmit and receive the modulated data. Modulation of the signal will take place at 38 KHz Frequency. Motor driver and Motor resembles the car engine. Also LCD used for the current system status indication. HORN switch and brake switch is used for actuation of the horn and car brake respectively.

Similarly when there is an emergency condition at car unit 1 with emergency braking system, a high priority signal is transmitted on the reverse channel which makes the car unit 2 brakes activated and the tire or engine will stop. Buzzer will give the audio indications for the different conditions of the system.

## II. Methodology

In this work, when ultrasonic sensor detects the obstacles frontside or backside of the car it will control the vehicle speed and gives the indication to the operator with the help of buzzer this controls with the help of using electronic controller unit. LCD uses to show the distance between vehicle and obstacles which is situated on dashboard.

### II.1 Component

**II.1.1 Ultrasonic sensor:** Ultrasonic sensors are great tools to measure distance without actual contact and used at several places like water level measurement, distance measurement etc. This is an efficient way to measure small distances precisely. In this project we have used an Ultrasonic Sensor to determine the distance of an obstacle from the sensor. Basic principal of ultrasonic distance measurement is based on ECHO. When sound waves are transmitted in environment then waves are return back to origin as ECHO after striking on the obstacle. So we only need to calculate the travelling time of both sounds means outgoing time and returning time to origin after striking on the obstacle. As speed of the sound is known to us, after some calculation we can calculate the distance.

**II.1.2 Motor Driver:** L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC.

**II.1.3 Motor:** Geared DC motors can be defined as an extension of DC motor which already had its Insight details demystified here. A geared DC Motor has a gear assembly attached to the motor. The speed of motor is counted in terms of rotations of the shaft per minute and is termed as RPM. The gear assembly helps in increasing the torque and reducing the speed. Using the correct combination of gears in a gear motor, its speed can be reduced to any desirable figure.

**II.1.4 Arduino:** Arduino is an open source computer hardware and software company, project, and user community that designs and manufactures singleboard microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical and digital world. Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards or Breadboards (*shields*) and other circuits. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler tool chains, the Arduino project provides integrated development environment (IDE) based on the Processing language project.

In this paper, Arduino is used for

1. Testing the input.
2. Execution of the program.
3. Updating the output.

**II.1.5 LCD:** A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in colour or monochrome. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and seven-segment displays, as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

### III. Experimentation

In this work, when ultrasonic sensor detects the obstacles frontside or backside of the car it will control the vehicle speed and gives the indication to the operator with the help of buzzer this controls with the help of using electronic controller unit. LCD uses to show the distance between vehicle and obstacles which is situated on dashboard. Block diagram of complete setup is shown in Fig.1

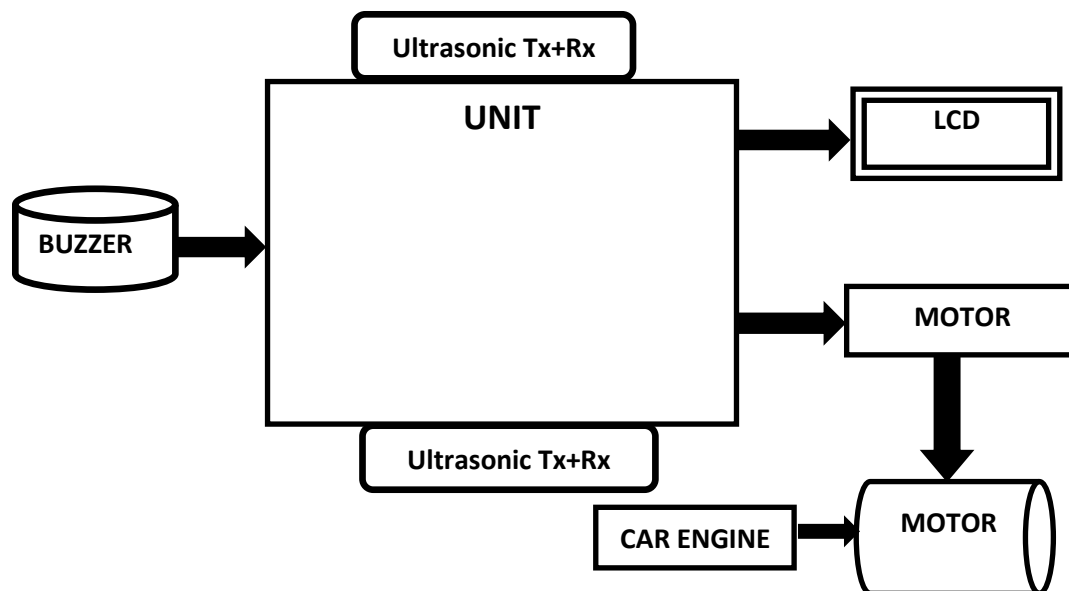


fig.1 block diagram of complete setup

### IV. Result Analysis

The system works on ultrasonic ranging technique, which is a non-contact ultrasonic distance measuring method. It can measure the distance to an object up to a range of 2cm to 400cm, with a measuring angle of 30°. An ultrasonic braking system consists of an ultrasonic transducer or sensor unit, control unit and braking mechanism. The result analysis is shown in Fig no.2



fig.2 photograph of complete system.

## V. Conclusion

As the whole system is based on simple micro-controller and its construction as well as design is simple. Also it is very easy to implement on the practical board. With the use of basic component, total cost for vehicle to vehicle communication will be very less.

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