

A Research Paper on Vehicle Avoidance System

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ABSTRACT: *Auto vehicles shall be equipped with accident detection devices, such as another car or a person, to identify possible impact series. When a possible collision has been observed, these systems take steps to deter a collision and/or to alert the wardrobe. The device consists of an ultrasound wave measurement system using the PIC 16f877A microcontroller which transmits an explosion of ultrasound waves along the path of the vehicle and then receives the corresponding echo from the artifacts ahead. The presence of the echo to the device is calculated by an ultrasonic sound sensor. A microcontroller precisely tests the time needed for the ultrasonic explosion to travel the distance from the device to the target and back to the machine. The alarm signal may also be issued if the driver exceeds a fixed limit on the gap between the vehicle and the obstacle. This also tracks the motion of the car and throws an alert if its pace reaches the mark of the size of a specific obstacle.*

KEYWORDS: *Microcontroller, Measurement, Sensor, Ultrasonic, Vehicle, Safety Guidelines.*

INTRODUCTION

This article defines an ultrasonic sound distance calculation device using the microcontroller PIC 16f877A. With the calculated path, whether the car is about to encounter some barrier, the microcontroller lets the vehicle unexpectedly halt. Accidents can be avoided by way of this equipment. The machine throws the vehicle's path into an eruption of ultrasonic sound waves and collects the appropriate echo from any barrier. The presence of the echo to the device is calculated by an ultrasonic sound sensor [1].

It is reliably determined by the microcontroller as the ultrasonic explosion travels from the device to the target and back to the machine. Present requirements for traffic control involve various styles of vehicle speed limiters, especially for roads near residential areas including hospitals, malls or colleges [2]. This "DYNAMIC SPEED GOVERNOR" concept reflects a modern means of regulating vehicle speed externally rather than centrally. Two PIC16F877As with an RF transmitter and receiver are used for speed calculation and power [1]-[4].

LITERATURE REVIEW

This initiative incorporates a range of groundbreaking approaches that incorporate wireless technology in order to introduce a robust speed control device for the latest speed limiting framework. In various inhabited areas, this suggested program will easily be introduced. The strength of the proposed device resides in its simplicity and production potential with minimal hardware adjustments, such as speed limit adjustments and speed regulation measures that are marginal in time with the program from the base station. The device being implemented is focused on micro controlling technology for the collection of data on speed and its transmission to a base station through a transceiver which analyzes the transmitted data and decides on speed limits and control specifications [5]. Both electronically and manually, a speed regulator controls the peak speed and/or maximum rpm of a truck. The supplier shall position the governor to conform to the national legislation, which provides for the selling of the vehicle, for the protection of drivers against driving at unsafe speed, or for the protection of the automobile against going outside its physical or mechanical stage.

1. Working of the system

The dynamic speed controller primarily consists of 2 parts:-the transmitter and the recipient. The machine is focused primarily on the technology of a micro controller for speed-related data collection and passes the data via RF communication to the micro operator. The microcontroller analyzes the transmitted data and determines the speed limits and the condition of power. In crowded areas such as clinics, centers and traffic regulatory schools a complex speed governor would be required [6]. The device RF transmitter is mounted on a signal plate, and the transmitter's micro-controller detects the speed limits of the field for the micro-controller to store the speed limit. The vehicle's speed limit is passed to incoming vehicles through the RF transmitter. The receiver acknowledges the incoming signal and then feeds the speed limit to an origin of a comparator. A RF receiver is within the car. A RPM meter converts the mechanical rotational activity of the vehicle and allows the speed of the coming vehicle

to be measured using this process. The next pin of the comparator is assigned the measured speed from the RPM meter [7]. At the comparator, all speeds are measured and the processor decreases the speed of the input pin by utilizing the PWM function of this micro device, where the speed limit is greater than the speed limit.

2. Ultrasonic Sensors

Ultrasonic sensors are typically used to assess distance or proximity with a broad spectrum of non-contact presence use. Ultrasonic sound is usually sent to a target that represents the acoustic back to the sensor. The machine would then determine the echo duration and calculate the distance to the target by sound velocity in the medium. The overwhelming number of sensors currently on the market vary in their assembly, environmental monitoring and software functionality. Figure 1 illustrate the ultrasonic sensor.

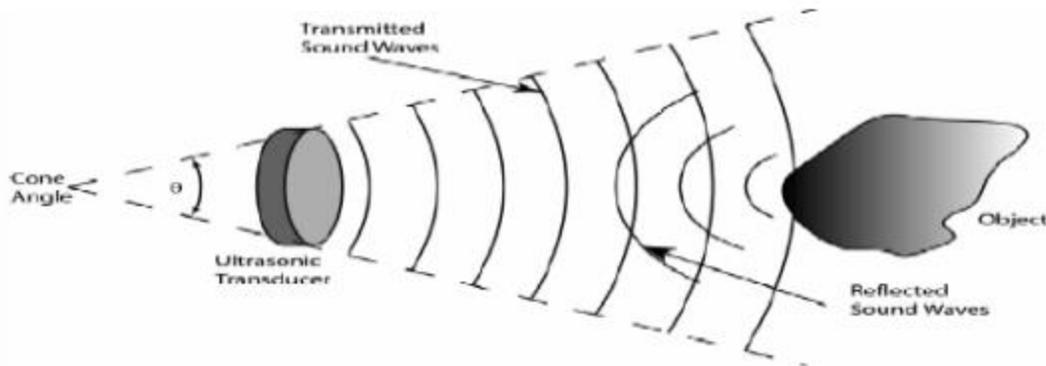


Figure 1: Ultrasonic sensor

We work at differing frequencies acoustically and with varying radiation levels. Normally, it is not difficult to choose or test electronic applications that better meet the environmental and mechanical specifications of a specific program.

An ultrasound system is simple to run. The unit receives ultrasonic sound waves and waits for the vibrations [8]. Once the sound wave or typically called echo is provided, the sensor measures differences in different ways. The sensor has been activated and then the echo pulse waited. To us it's necessary to calculate echo pulse duration, since $30 \mu\text{s}$ implies 1 cm for us [9].

3. Transmitter and Receiver pair:

It is made up of a receiver and transmitter set. For transmitter and receiver, there are two separate transducers. The transmitter sends the signals and the receiver awaits them. The chart below indicates the sender / receiver set.

4. LCD Module:

Figure 2 illustrate the LCD module, the LCD is a seventeen-pin module parallel controller. For the contrast modification, the first three Led pins are included. The first pin, second to the voltage distribution and third to the variable resistor are attached to the wall. The data lines (D0 to D7) are seven to 14 rows. The data lines D4 to D7 are used in this specific circuit, since there are four lines data buses accessible from the LCD carrier. The fifteenth pin has 5 volts supply associated.

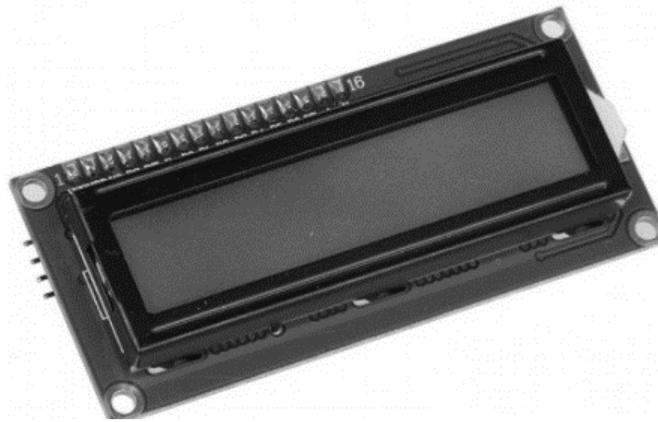


Figure 2: LCD Module

Control pins Pin 4, 5, 6, R / W, RS, RS, are allowed. A resistor attaches the 16th pin to the wall. When the transistor is turned on, the voltage from pic16f877a is triggered and switches on the LCD backlight Resistor R9.

5. Power Supply

The entry is given by the DC adapter. Diode IN4007 prevents the inversion of polarity when paired. Lead is used for status showing. For the elimination of ripples, capacitive filters are required. Electrolytical 1000uF condenser and disk condenser 0.1uF. For every amp current drawn and at least two times the input voltage, the condenser filter must be set to a minimum of 1000uF. The 0.1uF condenser prevents any high-frequency bursts that may conflict with the control mechanism. Robust stress regulators. Thanks to short circuits and overheating, they may tolerate over-current drawing. In all instances, before harm happens, the system powers down. A reverse voltage is the only way to kill the regulator. Reverse polarity nearly instantly kills the regulator. To stop this, the diode safety of the power supply will always be used. This is especially relevant when you are using 9 volts of battery supplies as people typically check the battery in one direction and then in the other. Only the brief "check," if no safety diode is used, may kill the regulator.

A 1N4004 control diode is usually attached to the power supply in series. The regulator is secured from injury when the connection is attached in the wrong way. Three terminal regulators with several defined output voltages are available in LM78XX series which are appropriate for a wide variety of applications. All of which is card control at local level, removing variations in the delivery of single point legislation. Such regulators may be used in logical schemes, computers, HiFi and other solid state electronic devices due to the usable voltages. While primarily intended to be fixed voltage regulators, these instruments may be used for adjustable voltages and current with external components. The LM78XX series is available in an aluminum TO-3 kit that allows loading current above 1.0A if adequate heat sinking is possible. The existing cap is used to assign a reasonable value to the peak performance existing. A protected area safety is given for the transistor to restrict the dissipation of internal energy.

6. Circuit Diagram

6.1. Transmitter:

Figure 3 shows the circuit diagram of Transmitter

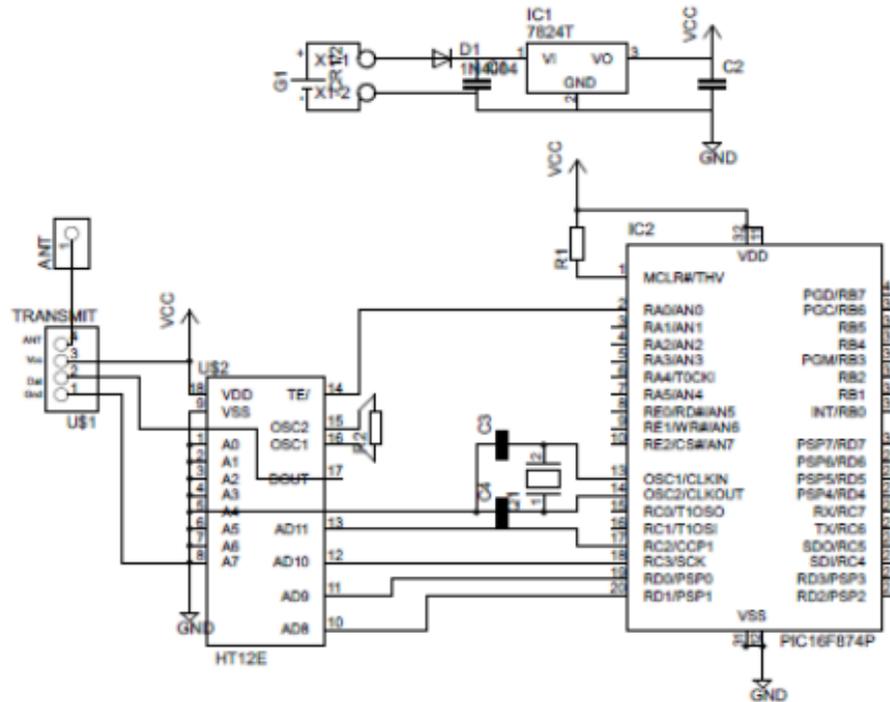


Figure 3: Transmitter Circuit Diagram

6.2. Receiver:

Figure 4 shows the circuit diagram of receiver.

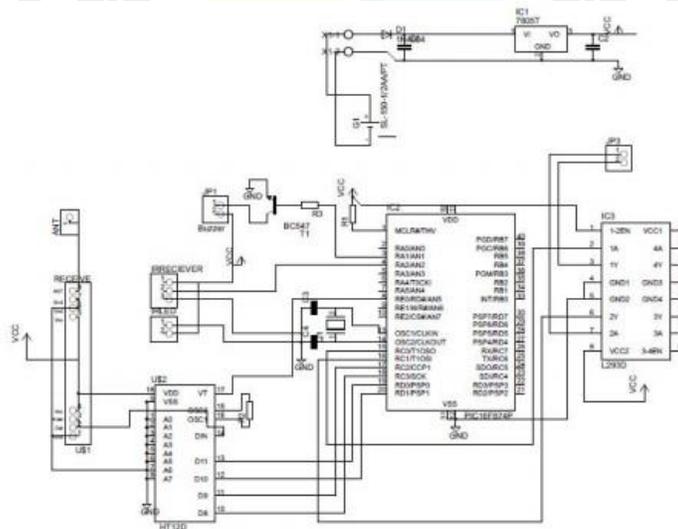


Figure 4: Receiver Circuit Diagram

7. PCB & Circuit Fabrication

7.1. PCB fabrication

The PCB is a mechanical device composed of fiberglass surface layers laminated with engraved copper designs. It is used for rigid assembly of electronic components for packaging. A main role in the construction of PCBs is played by the kind of integrated circuit components used in a manufacturing phase. Driver diameter, spacing

between signal drivers etc, is determined to give the driver's lines optimum wave impedance. Optimum wave impedance gives the pulse advantage in the wireless circuit minimal wait or increase and path.

7.1.1. Generation of Art Work

As the first step in the PCB development process, generation of PCB artwork should be taken. The piece is produced according to the required accuracy at 1:1:1 or 4:1 scale. The methods used for art work generation are tin drawing on a clear drawing paper or cutting and striping process.

7.1.2. Routing

Artwork generation for PCB output is not currently used. Instead, several kinds of PCB routing applications are available. CAD Tech EAGLE, ORCAD, TRAXMAKER, EASYPAGE, Gateway etc. are the main mobile programs. We use the Light EAGLE CAD here.

- Manual: Traces should be mounted manually, as with the conventional style, where any time you click on the mouse you adjust the trace direction.
- Follow-me: It integrates the strength of an auto router with automation and manual routing functionality.
- Auto Router: The whole track can be automatically redirected using this completely automated system by clicking on the right net side. Laser printer is extremely affordable, fast and reliable.

For everything, except the easiest PCB swell, the printer must have a minimum resolution of 600 dpi. The printer produces strong solid black without toner pinholes is quite necessary. Using manual feed on paper to identify the paper production direction to maintain the job as smooth as possible to eliminate the jamming by using monitoring paper or video. The illustrated image then is a picture with placed vertically. Perhaps the most flexible of all printing techniques is screen-printing. This may be used to print fabric, fabric, fabrics, bottles, metals, signs, stickers, decals, panels and all kinds of cloth and electronic circuit boards. The advantages of screenwriting are that the press may be printed on substrates of any type, thickness and scale. A major aspect of the screen printing is that the substratum has a larger thickness than for other methods of printing. This creates certain rather cool results which cannot be accomplished by certain forms of printing. Thanks to the ease of the production process, the screen printing will use a broader variety of inks and dyes than any other printing method.

8. Circuit fabrication and soldering detail

Soldering is an essential competency for electrical technicians. Soldering techniques. For the proper operation of machinery, good soldering is necessary. Solder is a tin and plum alloy. The most widely used solder is 60/40. This means 60% tin and 40% plumage is created. Around 400 degrees Fahrenheit, the solder melt. The bits must be adequate to heat the solder allowing solder to bind [10]. Within the solder is the Rosin fluid. Rosin-core solder is popular. The solder is added to the joint while it is dry. Fire is used for the solder melting of metal pieces. Sparing use can be made of only a limited amount of heat. The joint would feel slim and flat. If not, a "cold" solder joint may be. This is called "cold seam." It is vital not to destroy PCBs when soldering sections. It is best to use thin, low-wattage irons with PCBs and semiconductor tools for achieving the required clean surface lines, which involve flux fluid. Most metals appear to form oxygen-based complexes, which even at room temperature contribute to an oxide surface, react chemically with oxides and spread reaction materials. Before and after soldering, fluxes are added.

CONCLUSION

The idea presented here is novel in nature and there was thorough work done on coding, checked circuits, factored PCB, installed, soldered, produced your cabinet, evaluated the finished product, etc. all in the short term. Our success in this period will help us manage similar tasks in the future with ease. This initiative incorporates a range of groundbreaking approaches that incorporate wireless technology to introduce a robust speed control device for the latest speed limiting framework. In various inhabited areas, this suggested program will easily be introduced. The strength of the proposed device resides in its simplicity and production potential with minimal hardware adjustments, such as speed limit adjustments and speed regulation measures that are marginal in time with the program from the base station. The device being implemented is focused on micro controlling technology for the collection of data on speed and its transmission to a base station through a transceiver which analyzes the

transmitted data and decides on speed limits and control specifications. Such exposure has driven us to think more about the future and development and thereby incorporate our beautiful awareness and understanding of the huge ocean to electronics.

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