

Security System Based On Ultrasonic Object Detection

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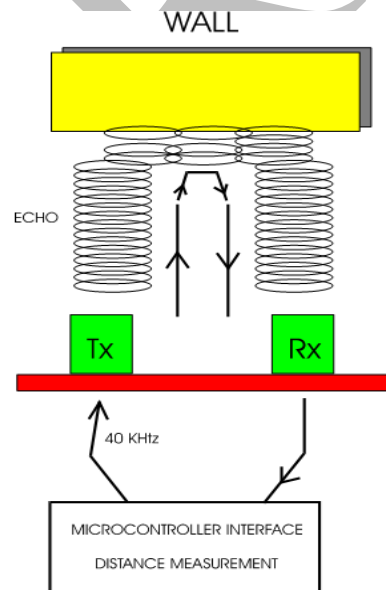
ABSTRACT –

This paper mainly focuses on detection of any object ahead of the ultrasonic transducer and thus demonstrating the idea of advance border security system. The ultrasonic module is interfaced to the microcontroller of 8051 family. Whenever any object approaches near the ultrasonic module, the signal transmitted the transmitter is reflected by this object and is received by the module. When the microcontroller receives the signal from ultrasonic receiver it actuates the output to take the appropriate action.

In this a robot that is controlled by RF technology is made. And we radar is interfaced with the help of ultrasonic sensor that senses the distance and displays it on LCD. And according to distance it takes appropriate decision on the basis of 'valid region' or 'valid person' by ID checking. This system checks the ID wirelessly.

I.INTRODUCTION

The Ultrasonic Distance Meter is used to measure the distance in between two points. The basic principal is based on the speed of ultrasonic waves in open air. The microcontroller AT89S51 transmits and receives ultrasonic waves through 40 KHz ultrasonic receiver and transmitters. By measuring the time required to travel the unknown distance by ultrasonic waves in air we can find out the distance between two points. The distance measured is displayed on a LCD display.

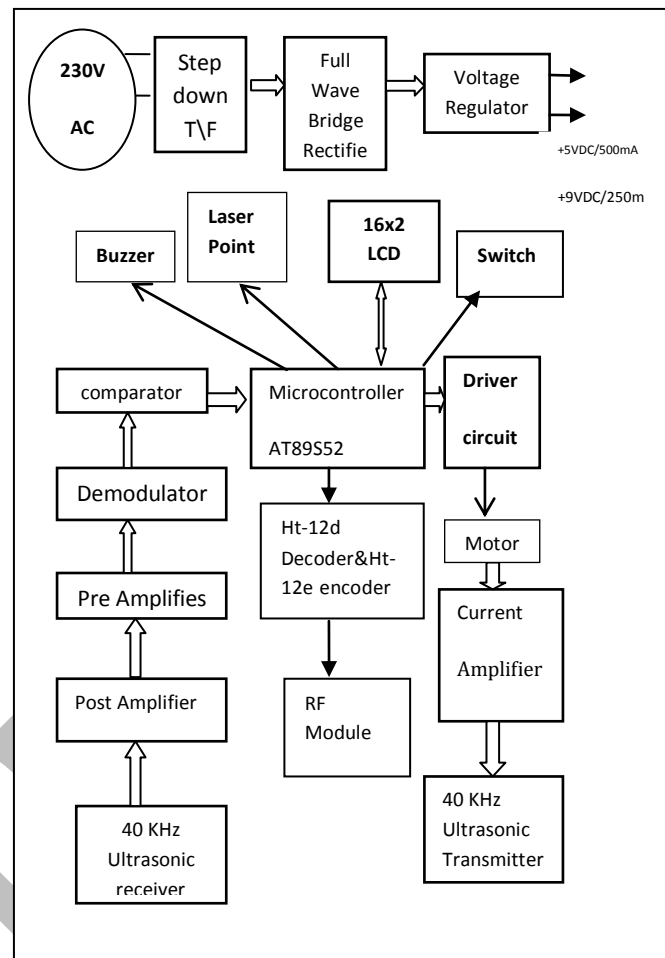


ULTRA- SONIC DISTANCE MEASUREMENT

There are four modes:

- **Wireless robot:** In this mode the robot is operated wirelessly through RF technology.
- **To design radar concept:** In this mode the ultra sonic sensor senses the obstacle and measures the distance and displays it on the LCD.
- **Boarder checker mode:** In this mode the switch is used for setting the critical distance and it can be changed.
- **Person checker:** In this mode the RF active module (wireless id card) senses the system automatically can take appropriate action for criminal.

II. BLOCK DIAGRAM



III. DESCRIPTION

- The ultrasonic module is interfaced to the microcontroller of 8051 family .Emitter produces 40 KHz sound waves which is reflected by the object and further is detected by the detector. Microcontroller calculates the distance sensed by the detector and displays it on the LCD.
- With the help of the switch we can set any distance range.
- If the measured distance of the object is either equal or less than the set distance then the microcontroller performs the following actions:

❖ Checks the ID

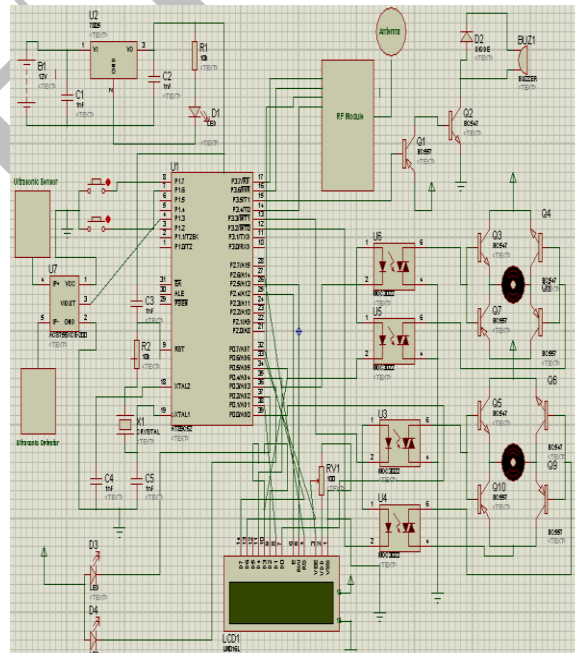
1. If the ID is not recognised then
 - The buzzer is beeped.
 - The Laser is pointed.

The user is alerted by unauthorised breach.
2. If the ID is recognised then detector starts detecting other objects.
 - If the measured distance of the object is greater than the set distance then no action is taken.

IV. APPLICATIONS

- Security area monitoring (in border).
- Wildlife photography.

IV. CIRCUIT DIAGRAM



V. FUTURE PROSPECTS

- It can be used in areas where humans cannot reach and also in areas where there is risk to their lives.
- It can be further improvised as the border security robot.
- It can be implemented in vehicles to avoid collisions.

VI. ACKNOWLEDGEMENT

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