

# DEVELOPMENT OF RADAR USING ULTRASONIC SENSOR

Jayprakash Maurya, Riyazuddin N. Khan, Mudassir Shaikh, Niraj Dhebe

Electronics And Telecommunication Department

Bharat College Of Engineering

Badlapur, India

sk.muiddi@gmail.com

*Abstract*— Radio Detection And Ranging (RADAR) are remote sensing system with military, scientific and commercial applications. EM wave are sends by the radio detection and ranging in which we use the radio wave to find the “the distance metallic objects”. In the laboratory disclose the earlier results in the development of radar network. Some development of radar are given below

- a. Wave form design and diversity.
- b. Radar network.
- c. MIMO Radar.
- d. Navigation and positioning.
- e. Target detection and tracking.
- f. Sensor fusion.
- g. Routing.
- h. Security and privacy.
- i. Network capacity.

**Keywords:** Radar Transmission, Radar communication, Radio waves, Radio efficiency, Waveform, Bandwidth.

## I. INTRODUCTION

### A. Radio signal.

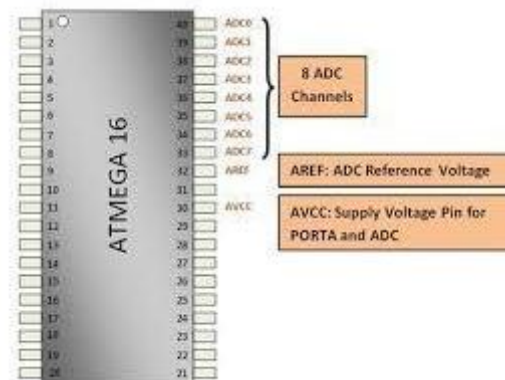
RADAR works as transmitter and receiver both in which we have a common antenna which work, as a transmitter and receiver. The dedicated transmitter is not available in Passive radar system. At the place of dedicated transmitter we use the environment, and fro this we measure the time difference of signal sends from the transmitter and the signals sends via reflection from the object. To determine the object bi-static-range. For bi-static range the passive radar which measure the bi-static Doppler shift of echo and the direction of arrival. And from this we find the location, heading and calculate the speed of object. Sometimes multiple transmitter and receiver are used for several measurement of bi-static range

Sometimes “Passive radar” is used incorrectly to describe the passive sensor which detect and track aircraft by RF emissions. E.g. Radar, communication, transponder emissions. All recent radars were bistatic cause of switched from transmit to receive mode technology was not developed.

## II. COMPONENT USED

### A. MICROCONTROLLER SECTION

In our project microcontroller ATmega16 is used.



It sense all the input parameter and depend on the program algorithm it operates the output.

### B. ULTRASONIC SENSOR

Ultrasonic sensor emit short, high frequency sound pulses at regular intervals.



These propagate in the air at the velocity of sound.

**C. SERVO MOTOR**

Servomotor are not a specific class of motor although the term servomotor is often used to refer to a motor suitable for use in a closed-loop control system.



Servomotor are used in application such as robotics, CNC machine etc.

**D. BUZZER**

Audio signaling device.



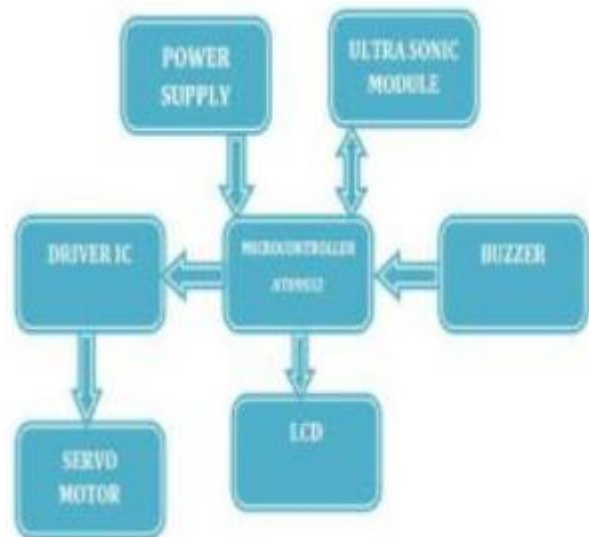
Include alarm device, timer and confirmation of user input.  
LCD

LCD display is provided for showing the current status of the system.

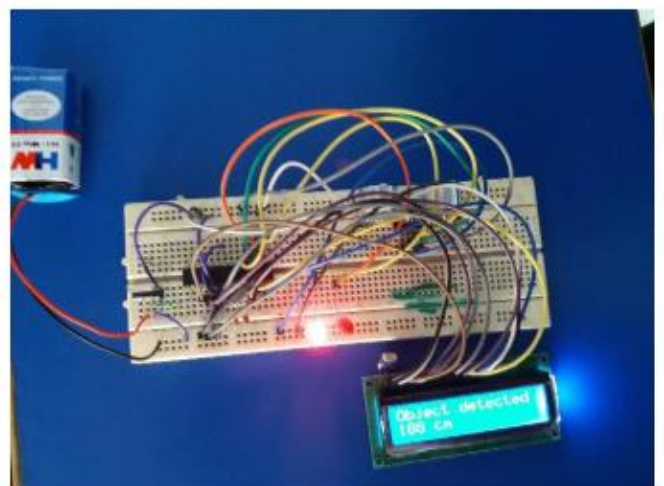


LCD used in 8 bit mode.

**III. SYSTEM BLOCK DIAGRAM**



**IV. SYSTEM WORK AT BREADBOARD**



IN this project if any object come across the project at a distance 180cm then it detects and buzzer are work at alarm function. For E.g. in the figure any object come at project distance then its detect and show the how long distance.

#### V. APPLICATION

There are various application which will given below:-

In spying systems, set up for similar activities.

Better operation in quick response.

Preparation of surveillance system.

Radar use in traffic control to track plans on ground and air both.

The military uses it to detect the enemy and to guide weapons.

Ultrasonic metal flaw detector. Under water network.

#### VI. RADAR RANGE EQUATION

The total power  $P_r$  reflected to the reference antenna is given by the radar equation.

$$P_r = \frac{P_t G_t A_r \sigma F^4}{(4\pi)^2 R_t^2 R_r^2}$$

In the common case where the transmitter and receiver are the same location,  $R_t = R_r = R$  and then

$$P_r = \frac{P_t G_t A_r \sigma}{(4\pi)^2 R^4}$$

#### VII. ADVANTAGE

NASA uses a radar to map the earth and other planets.  
Is distance measurement resolution is high.  
Its measurement updates is fastly.  
Radar procurement cost is vary low.

#### VIII. CONCLUSION

System is self-sufficient so reduction in man power as well as prevents further losses.

The system not only gives accuracy but also reduces the time in military surveillance

#### IX. REFERENCES

J.G .Proakis, "Digital Comm.", 4th edition. NY: McGraw-Hill, 2001.

M.I. Skolnik, "Introduction to Radar System", 3rd edition. New York ,NY: McGraw- Hill, 2001.

R.BaraniukandP.Steeghs,

"Compressive radar imaging" in IEEE

Conference, 2007.

Wikipedia

Tech Support, Ultrasonic Ranging Module HC - SR04.

<http://www.services.elecfreaks.com>.

Dontabhaktuni Jayakumar , A. Pravalika,

K. Purnachandra Rao ' Model Radar Implementation Using Ultrasonic Sensor' , paper published in November 2011.