

ENEMYSHIPDETECTOR CUMANTI-SHIP GUNUSINGULTRASONIC RADAR**¹Madugula Praveen Kumar, ²Banoth Sekhar Babu, ³Ramakrishna Porandla**

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Abstract:

Ultrasonic swells radiated from the model of radar through Ultrasonic sonic detector peregrination in to free space by surveying the girding area. However, the revolving radar medium will be concentrated over this unidentified boat and starts firing until the unknown boat dissolved or moved out of range, if it detects any adversary boat or boat. Since the Given boat or linked boat is having a communication link with main control unit, it'll be honored and allows freely sailing in the ocean. This is the main ideal of this design work and model of over said entire medium will be constructed fortherallypurpose. When the system is energized, the Ultrasonic detector attached to a motor starts revolving to descry the adversary vessels within the range of 2 bases roughly and the range is confined because it's a prototype module. With the help of a simulated gun deposited towards the ultrasonic surge's direction and moves along with radar medium delivers machine gun sound with flashing LED when the system detects unauthorized ship, However, green LED will be blown and boat details will be displayed through TV, If the system detects authorized boat also if the system detects unauthorized boat, red LED will be blown. This entire moving medium will be arranged over a top of small essence palace structure of 15 elevation height and it's intended to pretend oceanpalace used for radar system. The revolving medium can move a span of 0 – 300 degrees and its movements are confined through limit switches. The main processor is designed with 89c52 micro controllerchip and TV is used to display the information rainfall it's authorized or unauthorized ship, However, its data will be transmitted & entered information in the form of boat details will be displayed through TV, if authorized boat is within the range IR. Voice record cum playback chip is used to deliver the machine gun sound through speaker. H Ground IC is used to drive the DC motor.

Key words: Ultrasonic detector, Radar Revolving medium, Communication link, firing simulated gun, boat discovery.

Introduction:

The word RADAR means Radio Discovery and Ranging. Radar is an object discovery system that uses broilers to determine the range, altitude, direction, and speed of objects within about a 100- afar compass of their position. This is the real working system, but since it's prototype module, the conception presented then can descry the direction of unknown boat or boat. The being system of radar technology is too sophisticated, complicated, long range, and also, they're too expensive. Our defense sectors like Airforce, Navy, Army utilizes these advanced type or radar systems for different operations. Since it's a great subject and to learn little out of this super technology, then a low- cost introductory model of radar technology is enforced which is aimed to serve the Navy to

descry the unauthorized boat present in our demesne. In general, the radar antenna transmits radio swells or broilers that bounce off any object in their path. Due to this, we can fluently determine the object in the radar range. Radar is an electromagnetic detector that's used to descry and detect an object. Radio swells or broilers are radiated out from the radar into free space. Some of these swells are interdicted by reflecting objects. These interdicted radio swells hit the target and are reflected in numerous different directions. Some of these swells can be directed back toward the radar, where they're entered and amplified, However, also it means an object is in the propagation direction, if these swells are entered again at their origin. The ultra modern radar system is veritably advanced and used in largely different operationssimilaras Airbusinesscontrol, Air-defensesystem, radar Astronomy, Antimissile system, external space Surveillance system, and numerous further. In this design work short range ultrasonic detector is used to apply introductory conception of radar system. It's a propinquity detector that's used to measure the distance of a target object. Then distance isn't criterion, chancing the direction, relating the boat whether it's authorized or UN-authorized, simulation of firing over the UN-identified boat, etc. are implanted for demonstration purpose.

The ultrasonic detector detects the object by transmitting ultrasonic swells and converts the reflected swells into an electrical signal. These sound swells travel faster than the speed of the sound that humans can hear. It has two main factors, the transmitter & receiver. The transmitter emits the sound using a piezoelectric demitasse, and the receiver encounters the sound after it has travelled to and from the target. For the computation of the object distance, the detector measures the time taken by the signal to travel between the transmissions of the sound by the transmitter to the reflecting back towards the receiver. Then we aren't chancing the range. These detectors are substantially setup in machine tone-parking technology and anti-collision safety systems. Also, used in robotic handicap discovery systems, manufacturing technology, and numerous further.

Literaturereview:

Existingmethod:

Our being system is ultrasonic radar system which will identify the unauthorized boat and fire the boat unit the boat vanishes for this purpose we're using voice cum play back archivist and the boat information is displayed using TV display. Entire system is controlled by the processing unit 89c51 micro controller.

Proposedmethod:

The ideal of this design is to produce a prototype module of a radar system that can descry and separatebetween authorized and unauthorized vessels within adefined rangeofroughly2 bases. The system uses an ultrasonic detector attached to a motor to overlook the girding area and a simulated gun deposited towards the ultrasonic surge's direction to deliver machine gun sound with flashing LED when it detects an unauthorized boat. The system also displays boat details through an TVwhen it detects a sanctioned boat. The entire medium is arranged over a small essence palace structure intended to pretend an ocean palace used for radar systems. The main processor of the system is an 89c52 micro

controller chip, and an H Ground IC is used to drive the DC motor. A voice record cum playback chip is used to deliver the machine gun sound through a speaker. The system's movements are confined through limit switches, and the revolving medium can move as far as 0 – 300 degrees.

The design aims to demonstrate the functioning of an introductory radar system and show how it can be used to separate between authorized and unauthorized vessels. It provides a useful illustration of how ultrasonic sensors can be employed in similar systems and demonstrates the use of colorful electronic factors, similar as micro controllers, LCD, and H Ground ICs. The design also showcases how limit switches can be used to circumscribe the movement of a revolving medium. Overall, the design serves as a precious literacy tool for scholars and suckers interested in electronics and radar systems.

Methodology:

To prove any design work virtually for the demonstration purpose, construction of described model is essential. For this purpose, suitable tackle and software in the form of electronic, electrical and mechanical factors are essential to perform the given task. When these factors are integrated together or working together, better results can be attained from the design work. Since it's a practical acquainted design work, the content presented in the epitome must be proven virtually. In this regard needed active tackle like IC's and other special factors must be gathered and their details must be described in this chapter to fulfil the conception of perfect design report. Keilµ Vision IDE is used as a software requirement and hardware requirements of this project are 89C51Micro controller chip, LCDTSOP1738, Ultrasonic sensor, Voltage regulator, LM555 timer chip, Buzzer, 89c2051, L293D H Bridge IC, Relay, DC motor, APR 33A3 Voice record cum playback chip, Speaker, Microphone.

A)Block Diagram

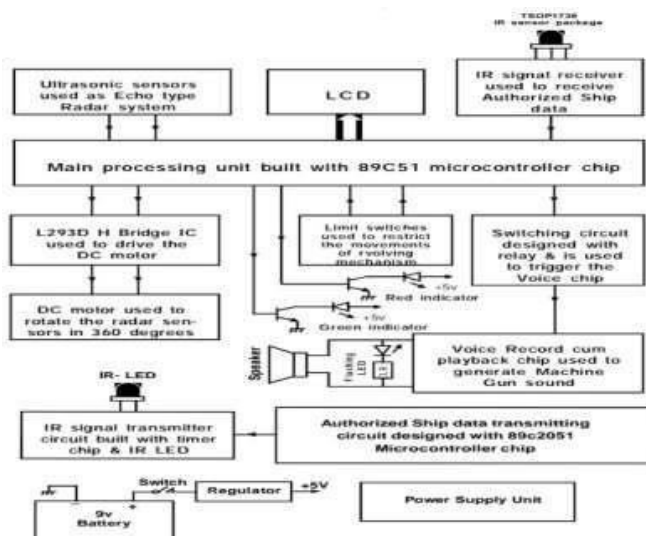


Fig.1.RADAR based unauthorized ship Detector using Ultrasonic Sensor

Fig.1. shows the block illustration of RADAR grounded unauthorized boat Sensor using Ultrasonic Sensor system the above block illustration used to display the essential rudiments of the system through clear and simple disconnectedness. Coming to the ship data transmitter and its receiver. The process begins with the ship data transmitting card, this card is supposed to be installed in the ship is designed with 89C2051 micro controller.

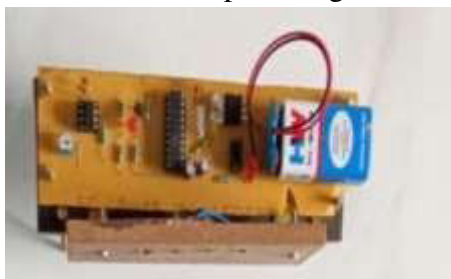


Fig.2.Shipdata Transmitter

Fig.2. shows the Ship data transmitter the data transmitting card is designed as compact, & it is arranged in a small toy ship. AT89C2051 micro controller is used in the ship generates digital information that is proportionate to the ship information, this is a per-programmed chip always generates the same information. The digital information contains vehicle number, and it is transmitted through optical sensor. The digital data produced by the controller is modulated at 38 K Hz frequency. The modulated wave is driving the IR LED. The signal delivered from the IR LED transmits the information in uni-direction like a laser beam. This LED must be exposed from the vehicle & there should not be any obstacles, the signal delivered from this device must travel in space freely. It is the function of infrared LED to deliver the infrared energy in the form of infrared rays, through which data will be transmitted. As we have implemented a prototype the range of the through the junction of IR LED we can increase the range till 20 feet.

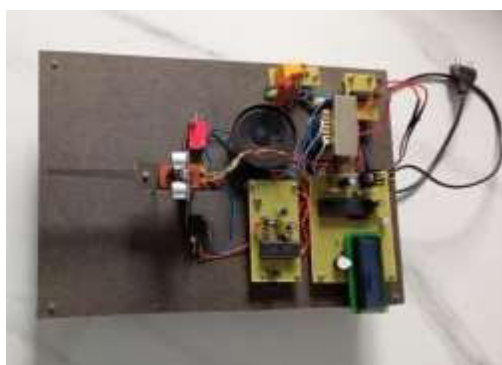


Fig.3.ShipdataReceiverPrototype

Fig.3. shows the ship data receiver prototype. The main processing unit of prototype module is constructed over a wood plank, and it is arranged over a metal structure at some height, this arrangement is made to simulate the system works over the sea water to detect the enemy ships.

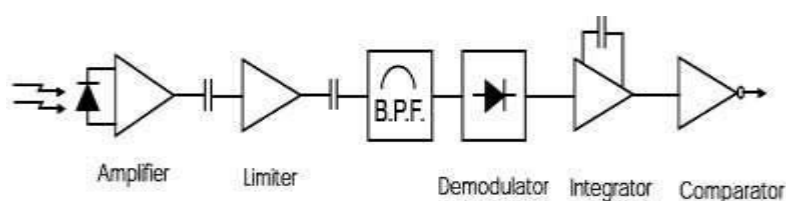


Fig.4.ShipdataReceiver

Fig.4. shows ship data receiver IR signal receiver is arranged, and it is interfaced with main processor. TSOP 1738 is used as IR sensor package, and this is a three-pin device & operates at 38 KHz frequency. This sensor package that contains all required blocks internally demodulates the data and the original code that is transmitted will be re-developed at the final output, TSOP 1738 is a kind of IR signal receiver package consists of IR detection diode (photo diode), signal amplifier, limiter, Band Pass Filter, Demodulator, Integrator and comparator. As this sensor package operates at 38 KHz, the signal delivered from the transmitter is modulated at 38 KHz. The modulated frequency produced by the transmitter should be exactly the same with sensor package, and then the communication link will be established between transmitter & receiver.

This main processing unit is designed with 89C51 micro controller. The 89C51 micro controller is programmed to perform multiple functions, one main function is to decode the data obtained from the TSOP IR signal sensor and display the data through LCD interfaced with it.

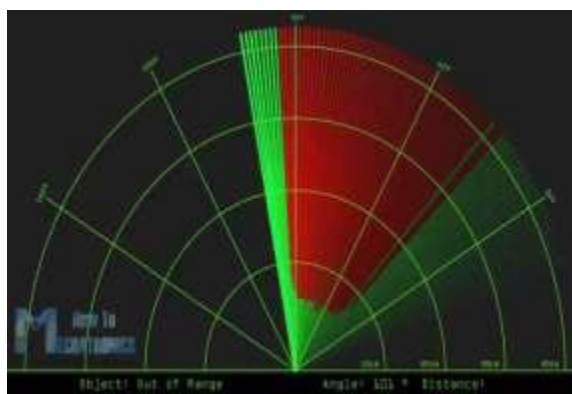


Fig.5.RADARbasedshipDetectorusingUltrasonicSensor

Fig.5. shows the detection of ship using radar based ultrasonic sensor. Adversary boat detector cum anti-boat gun using Ultrasonic radar system originally when the force is given system rotates the radar mechanism, for this purpose DC motor is used and it is driven through L293D H Bridge IC. The Ultrasonic sensor arranged over this mechanism rotates by 300 Degrees and this moving span is restricted through Limit switches. These limit switches interfaced with main processor activates

when rotating mechanism

touches at both sides. In the prototype system in order to protect the circuit connections the moving span is restricted to 180 degrees. Ultrasonic sensors transmit sound waves toward a target and will determine its distance by measuring the time it took for the reflected waves to return to the receiver. This sensor is an electronic device that will measure the distance of a target by transmitting ultrasonic sound waves, and then will convert the reflected sound into an electrical signal. Now in this project work, the output of the sensor is fed to the pin no;1 of 89c51 and it is programmed to display the detected target whether it is authorized or unauthorized and this information will be displayed through LCD.

Result and Discussion:

Enemy ship detector cum anti-ship gun using Ultrasonic radar system originally when the force is given motor starts rotating which is attached with Ultrasonic detector and TSOP which will rotate 0 to 300 degree and detects the vessels around the system once it set up a boat also it'll start decryption the data which is being transmitted from the boat after decryption the boat information if it is authorized it will display "Authorized ship" message on LCD and Green Led is turned on. Similarly, when an unauthorized ship is detected, it will display "Unauthorized ship" message on LCD. And red led is turned on and the gun firing starts as we've enforced a prototype then we're using only gun fire sound in the real time original gun firing happens and it continues till the ship vanishes. Voice archivist cum playback to record gun sound and when an unauthorized boat is detected the speaker produces gun fire sound for one nanosecond and again start detecting other vessels in this way we will identify the unauthorized ships and cover from coming pitfalls.

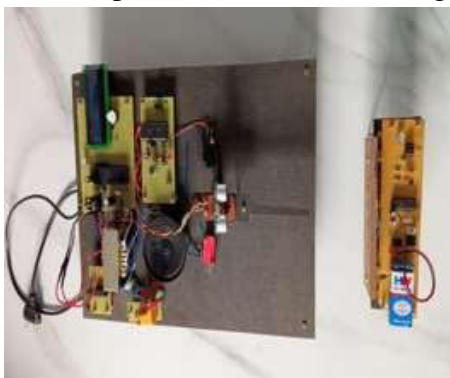


Fig.6. Ship detector Prototype

Fig.6. shows the prototype of RADAR based unauthorized ship detector using ultrasonic system. The entire system is described in two parts: one is the ship which acts like a transmitter and the other is a system with a main processing unit which acts like a receiver.

LCD Display

The display section is designed with LCD and the main function of this display is to display the ship details and it is programmed to display the detected target whether it is authorized or unauthorized and this information will be displayed through LCD. Whenever the authorized ship passes near by the system, the corresponding sensor will acquire data from the ship and this information is passed to the microcontroller unit by which ship information will be displayed through LCD.



Fig.7.a) LCD displaying welcome message

Fig.7. a) shows When the system is energized, the Ultrasonic sensor attached to a motor start revolving to detect the enemy ships within the range of 2 feet approximately and the range is restricted because it is a prototype module. Initially LCD displays Welcome message.



Fig.7.b) LCD displaying authorized ship message

Fig.7. b) shows with the help of a simulated gun positioned towards the ultrasonic wave's direction and moves along with radar mechanism delivers machine gun sound with flashing LED when the system detects unauthorized ship. If the system detects authorized ship, green LED will be glow and detected authorized ship message and the distance of the



detected ship also be displayed through LCD.

Fig.7. c) Displaying unauthorized ship message

Fig.7. c) shows when the system detects unauthorized ship, red LED will be glow and detected unauthorized ship message and the distance of the detected ship also be displayed through LCD.

Conclusion and Future Scope:

In this design work Ultrasonic detector is used for detecting & locating the object, since it's a proto type module a introductory module of radar system is designed and the main debit of the system is that it cannot feting the objects of colorful kinds at considerable distances. Range is also veritably short, to overcome these problems image processing system with long range detectors can be used. The ultrasonic detector operates by transmitting

electromagnetic energy toward objects, generally appertained to as targets, and observing the echoes returned from them. The targets may be aircraft, vessels, vehicles, etc. Besides determining the presence, position, and haste of similar objects, in advanced radarsystems, radar can occasionally gain their size and shape as well. There are numerous advancements that we can make to our system in order to produce better results. First of all, we need to increase the range of the discovery, not having to limit our input signals as much to get accurate results. We need to acclimate with the slice rate that we use in order to be suitable to descry lower rapidity as well as more accurate ranges. We could optimize the algorithm for the peak locator in the haste analysis to give more accurate results. In the end, we managed to produce a system that created signals to shoot out with a RADAR, as well as pretend a returned signal for objects a specific distance down. We were suitable to descry the objects that were fairly close, the main conception involved in the system is to descry the boat and fete it, in this part we could suitable to achieve good results. Eventually, performance of the over system results was set up to be good or satisfactory. While there has been plenitude of time devoted to exchanges of Adversary boat discovery it's time to re conceive the end of the first section of the paper including a list of four pretensions that were important to negotiate for the paper to fully cover its compass. Pretensions one, two, and five were achieved in the first five sections, but thing three requires its own special attention. More specifically, there needs to be discussion into not only ways to meliorate the current design, but also ways to expand upon it or use its ideas or findings in other ways. As it stands, there are at least four visible advancements that could be made to the current design. First, perhaps most obviously, the prototype model is confined to a limited range of 2 bases, and its delicacy may vary depending on the terrain and other factors. unborn development could concentrate on enhancing the range and delicacy of the system, by using more advanced detectors, signal processing ways, and algorithms. The prototype model requires mortal intervention to descry and identify vessels, and spark the simulated ordnance and LED. unborn development could involve adding autonomy and intelligence to the system, using machine literacy, artificial intelligence, and other advanced technologies. This could enable the system to operate more singly and make better opinions grounded on the data it collects. The prototype model is designed as a demonstration model, and its factors may not be optimized for cost and scalability. unborn development could concentrate on optimizing the cost and scalability of the system, by using further affordable and extensively available factors, and designing it for mass product and deployment.

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