

## Deep Sea Fisherman Patrol System

Sahukara Rohini Rajitha, Asish KS, Vaishnavi Tantry,  
Rajeswari PK

*Applied Electronics And Instrumentation, ASIET, Kalady, M G University, India*  
*Applied Electronics And Instrumentation, ASIET, Kalady, M G University, India*  
*Applied Electronics And Instrumentation, ASIET, Kalady, M G University, India*  
*Applied Electronics And Instrumentation, ASIET, Kalady, M G University, India*

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**Abstract:** *This paper introduces an intelligent design which would transform the life of fishermen community in India. One of the problems faced by the Indian fishermen is the arrest made by the neighbouring country. This is because of the lack of knowledge of their position across the sea. This problem can be overcome with the dynamic location of the vessel by using the Global Positioning System (GPS) and the Electronic Control Unit that uses PIC16F877A MICRO CONTROLLER along with a weather forecast.*

**Keywords:** *PIC16F877A, GPS, Transmitter, Motor, Receiver, Sensors (Humidity, Temperature, LDR), Zigbee,*

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### I. Introduction

The Indian Coastguard was formally inaugurated on 18 August 1978. It is set as an independent armed force of the Indian Union, through an act of parliament. It normally deal with marine safety, maritime security, lifesaving, law enforcement, maritime environmental security and fisheries. These call for monitoring, control, surveillance and response. The Coastguard has multiple responsibilities and strengthening the safety of fishers[2]. Fishers are vulnerable to disasters of several kind- accidents, casualties, abduction, and alien interventions. The Indian coastguard cannot assist fishers exclusively but concern for fishers is central to its aims.

The strategic role of the Coastguard is to protect the maritime zones from illegal activities including infiltration through maritime routes and environmental damage and provide humanitarian and scientific assistance within the maritime domain[4].

The Indian Coastguard too has its exclusive duties and functions as spelled out in the Coastguard Act 1978, include

- Safety and protection of islands and offshore structure
- Protection and preservation of maritime environment and endangered species
- Prevention and control of pollution in maritime zone
- Assistance to the customs in anti-smuggling operations
- Assistance to fisherman in distress at sea
- Safeguarding life and property at sea
- Preventing poaching in Indian water
- Assisting in ocean research
- Enforcing maritime law

We expect our device with GPS tracking and our concept of ZIGBEE-assisted community patrols will prove successful in India and elsewhere in the world. We are sure that this technology will benefit the poor fishermen and protect the coastal environment.

This paper introduces a design which deals with an innovative handheld device which would transform the fisherman community as the eyes and ears of the Indian Coastguard. Upon sighting an intruder or poacher, the device allows fisherman to calculate its exact location using the integrated GPS receiver, and radiates

the information to the nearest coastguard station via ZIGBEE communication[1]. The coastguard is then able to dispatch a patrol boat to intercept the intruder. The device would also warn the fisherman (beep and vibrate) when they approach near the national sea border and controls them to trawl (go fishing) within the correct region safely. Our project includes the active weather forecast to the coastal and boat also. Community surveillance allows the coastguard to patrol efficiently because they could go only on an alert call and not to patrol at random.

Also we are going to implement a system that would make the fishermen and the coastal guard to alert in case of drastic weather changes like rainfall and storm. We have a receiver and transmitter system i.e., in case of thunder and heavy storm and rainfall, when the boat is in the middle of the sea we are planning to inform the coastal guard that the situation is drastic here so that they can take appropriate measures in such situations[3].

## II. Block Diagram

This project is designed with a microcontroller, LCD, GPS, and buzzer. Mainly 2 sections: one transmitter and one receiver section, in boat and coastal respectively. In this system, GPS tracks the position of the boat and feeds to the microcontroller. Buzzer alerts when the boat crosses the boundary. Also, we have a Zigbee network so as to establish communication between the coastal guards and the fishermen in the boat. Apart from this, we are also going to include a fresh water analyzer (ultrasonic type) and a lightning detector (LDR system) so as to give indications in case of heavy storm and rainfall. LCD always displays the position of the boat, indications of heavy rainfall, storm to both the coastal guard and the fishermen.

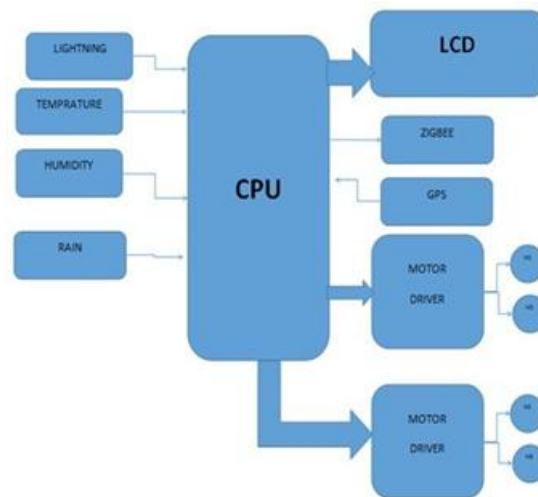


Fig:1 Transmitter section

In the conventional, the fishermen have to keep watch the maritime border, which cannot be easily separated as land region. If they crossed certain limit on the sea. They have to pay the penalty or got arrested by the naval guards of the neighbor country. The project generates alarm if they cross the border by mistake. With the simple circuitry and the use of sensors (low cost sensors) makes the project a low cost product, which can be purchased even by a poor fisherman. This project is best suited for places where the fishermen continuously monitor the boundary limit. This project also aims at solving relevant natural disaster problems with the usage of heavy rainfall analyzer and lightning detector. Our goal is to confront wireless networking with a concrete problem of worldwide dimensions, the sustainability of fishermen community are taken care by the simulation experiments. The simulation result shows the circuit level work is outperformed well that can be extended to circuit fabrication in future. This paper will be used for advancement of coastal border management. This also will give sufficient process to both ship and coastal guardians, if anyone crossing the border. The process of routing the fishermen will make more efficient[7].

There are two parts transmission part and reception part. The transmission part uses a CPU of 16F877A and it has 4 inputs and the outputs are ZigBee, motor driver, and LCD. The inputs are lighting detector , temp sensor, humidity sensor ,rain gauge sensor, and GPS .The lighting detector uses the LDR.LDR are given potential driver resistance in series and the resistance is grounded. As LDR resistance changes the potential difference is given to the CPU's 2nd pin and as soon as it is given it is connected to analogue to digital convertor. A threshold value is set already and after conversation it checks with this threshold value, if it is more than that threshold value through ZigBee an alert is sent. We use LM35 in Temp sensor and the output voltage is set to 20degreeC which gives a voltage of 0.20 volt. We can calculate this by voltage \*100 gives the value in centigrade. This is connected to the 3rd pin and has the same function as conversation of analog to digital. The temp in degree centigrade is obtained by voltage

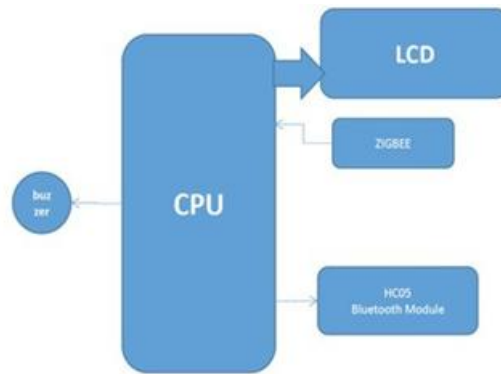


Fig:2 Receiver section

\*100.Next we have humidity sensor and the unit of humidity sensor is percentage. For example if 90% a corresponding voltage value is obtained and we check that voltage value and convert it into percentage. gauge sensor is detected in a vessel and it is measured in centigrade. We use ultrasonic for rain gauge sensor . In ultrasonic a sound is sent and the timer is started to record the time it takes to reflect back. And the value is noted and converted to centimeter[2].

An LCD is used to display all the parameters used in the boat. A ZigBee is used to send all the data to the base station.A GPS is used to record the location of the boat. We use 2 motor drivers in our project. Because as we know 1 motor driver is used to run 2 motors and in our project we use 4 motors so we require 2 motor drivers. The motor RPM is 60 and is used to control the speed. Next we have the receiver station. The data from the boat is received through ZigBee in the station.The data are humidity , temp, lighting alert, GPS location, receiver receives these information and it acts as a base station. Base station are of two types: Fixed section and mobile section. In fixed section the data coming to base station is through ZigBee[2]. This data is decoded and displayed in LCD as a real time value. But to show the weather report and to show the list of data's graphically in mobile device we use an interface. In mobile phone the temperature , humidity, and rain gauge data's are displayed through the help of a Bluetooth. To receive information from boat to the base station (fixed station) we have ZigBee[4]. But to receive the information in the phone we cannot use ZigBee. As a result we use Bluetooth to receive this information from boat to the phone. Bluetooth can also be used to send alert to the boat and also to the station.pic.for the prototype making we made a four wheeler small vehicle type system for this project in place of a floating boat.

### III. Conclusion

In the conventional, the fishermen have to keep watch the maritime border, which cannot be easily separated as land region. If they crossed certain limit on the sea. They have to pay the penalty or got arrested by the naval guards of the neighboring country. The project generates alarm if they cross the border by mistake. With the si

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