



# Sea-Way Border Alert System for the Person in the Boat by Implementing RSSI

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**Abstract:** The technology proliferation of Received Signal Strength Indication (RSSI) is used to provide location based positioning and time details in all climatic conditions and even anywhere any time. This method focuses on implementing border identification system for all boats. However, the existing system is not powerful enough to prevent the crime against fishermen as it gives only the information about the border identification but not about the exact distance that the boat has travelled from the border. The proposed system's transmitter section includes microcontroller RSSI module, voice playback circuit and DC motor and the receiver section includes RSSI, PC as monitoring database in the control room of port. And we can monitor the fishermen through IOT module.

## I. INTRODUCTION

Wireless Integrated Network Sensors (WINS) combine sensing, signal processing, decision capability, and wireless networking capability called Zigbee which is a compact, low power system. On a local, wide-area scale, battlefield situational awareness will provide personnel health monitoring and enhance security and efficiency. Also, on a metropolitan scale, new traffic, security, emergency, and disaster recovery services will be enabled by WINS. Here first it identifies the node where the harmonic signals are produced by the strange objects and the intensity of the signal will be collected. The signal will be sent to the main node. The processing of the regular interval data from the nodes will be analyzed and based on the intensity of the signals and the direction of the detecting nodes gets changing will be observed and the results will be sent to the satellite communication system. 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 is the fourth armed force under the Ministry of Defense- the first three being the Army, the Navy and the Air Force. It has a specific character for non-military security but addresses to National Defense. It normally deals 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 fisher. 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.

## II. IOT (INTERNET OF THINGS)

The Internet of things (stylized Internet of Things or IoT) is the internetworking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. In 2013 the Global Standards Initiative on Internet of Things defined the IoT as "the infrastructure of the information society. "The IoT allows objects to be sensed and/or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. Typically, IoT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) communications and covers a variety of protocols, domains, and applications, the vision of the Internet of things has evolved due to a convergence of multiple technologies, including ubiquitous wireless communication, real-time analytics, machine learning, commodity sensors, and embedded systems.

### RSSI Technology

Localization and safe evacuation of passengers in large ships during emergency is a growing and important need recently in the maritime industry. Through the Lynceus2Market project [1], it is aimed to develop an overboard localization system that can determine the position of passengers in case they fell overboard the ship into the sea. Through active reflector tags, which will be integrated within the passengers life jackets, passengers' positions can be determined by an unmanned aerial vehicle (UAV) equipped with global positioning system (GPS) surveying the area around the ship.

$$RSSI = P_r = P_t \times (\lambda / 4\pi d)$$

The active reflector tags will use 24 GHz switched injection locked oscillator (SILO) for high resolution localization and it will also incorporate 868 MHz Zigbee transceivers for long-distance communications, which is up to 8 km in an outdoor line of sight scenario with an output transmit power of 14 dBm. The 868 MHz Zigbee will also provide RSSI which can be used to implement a less-accurate localization system for far away passengers which are not in the range of the SILO radar. The advantage of RSSI localization is that it is nearly implemented in all receivers, so it does not require dedicated hardware.

### III. EXISTING SYSTEM

- Borderline measured manually.
- Difficult to communicate to navy control
- Functions of this system based on time and distance.
- Lack of cyclone alert communication

### DISADVANTAGES

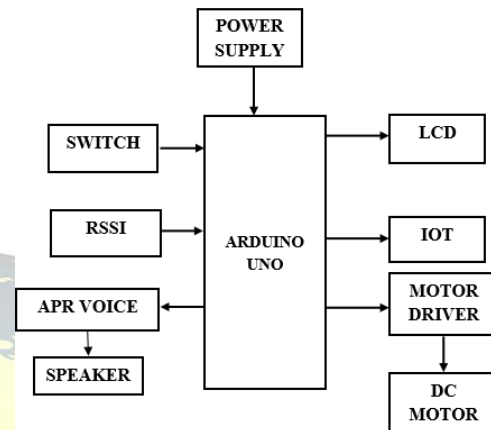
- Human life loss.
- Lack of time to get information like cyclone alert.
- Don't know the border limit.

### IV. PROPOSED SYSTEM

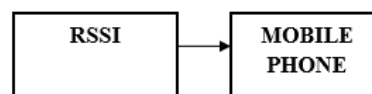
- In our project, we are using RSSI technology to alert the fisherman in which distance they are from the border.
- Communication between fisherman boat and Navy control will be done by wireless communication.

- Boundary identification through RSSI technology.
- Display system for identifying boundary.

### Block Diagram Boat Section



### Harbor Section



### ADVANTAGES

- Human life is saved.
- Android app will be used for the wireless communication for the Navy.
- Easy to find the distance from the border.
- Time requirement is low.

### HARDWARE REQUIRED

- Arduino Uno
- IoT
- Power Supply
- RSSI
- Switch
- LCD
- APR Voice
- DC Motor
- Motor Drive
- Speaker

### SOFTWARE REQUIRED

- Arduino IDE
- Language : Embedded c
- Cloud Server

## V. WORKING

In the proposed system, the boat distance can be measured using the received signal strength received from the slave RSSI (boat). Arduino UNO is used as the controller which controls the proposed system. By using this RSSI we can find the location (zone) of the boat in the sea. Whenever the boat is to reach the border the APR voice alert the concern person in the boat and at the same time boat will automatically turn OFF. IOT is used to monitor the overall process. LCD is used to print the current status from the controller.

### RSSI based embedded hardware fabrication

Received Signal Strength Indicator (RSSI) is a measure of the power present in a received radio signal. RSSI is usually invisible to a user of a receiving device. However, because signal strength can vary greatly and affect functionality in, IEEE 802.11 devices often make the measurement available to users. It is a measure of the power level that a RF client device is receiving from an, for example. RSSI is the relative signal strength in a wireless environment and can be measured in any unit of power. It is often expressed in decibels (db), or as percentage values between 1-100, and can be either a negative, or a positive value.

### IoT Node Mcu

Node MCU is an open source IoT stage. It incorporates firmware which keeps running on the ESP8266 Wi-Fi SoC from Expressive Systems, and equipment which depends on the ESP-12 module. The term NodeMCU typically refers to the firmware, whereas the board is termed Devkit. NodeMCU Devkit 1.0 consists of associate ESP-12E on a board that facilitates its use. It additionally contains a transformer, a USB interface. The expression "NodeMCU" of course alludes to the firmware as opposed to the improvement units. The firmware utilizes the Lua scripting dialect

The NodeMCU (Node Micro Controller Unit) is an open source software and hardware development environment that is built around a very inexpensive System-on-a-Chip (SoC) called the ESP8266. The ESP8266 is designed and manufactured by Express, contains all crucial elements of the modern computer: CPU, RAM, networking (wi-fi), and even a modern operating system and SDK. When purchased at bulk, the ESP8266 chip costs only \$2 USD a piece.

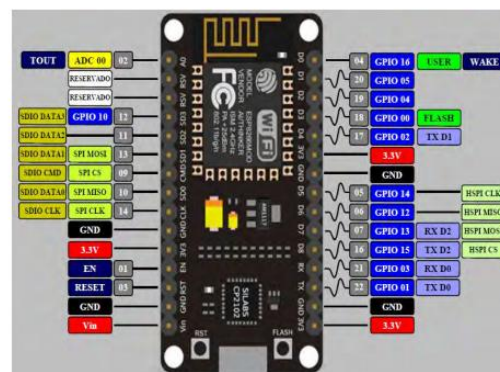


Fig: Esp8266 NodeMCU chip

## VI. 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 neighbour 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 paper will be used for advancement of coastal border averment. 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. The process of increasing the accuracy will be achieved greater in future.

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