

Fishermen Safety Border Alert System

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ABSTRACT

In day-to-day life we hear about many tamil fishermen being caught and put under Sri Lankan custody and even killed. The sea border between the countries is not easily identifiable, which is the main reason for this cross border cruelty. Here we have designed a system using embedded system which protects the fishermen by notifying the country border to them by using Global positioning System (GPS) and Global system for mobile communication (GSM). We use GPS receiver to find the current location of the fishing boat or vessel. Using GPS, we can find the current latitude and longitude values and is sent to the microcontroller unit. Then the controller unit finds the current location by comparing the present latitude and longitudinal values with the predefined value. Then from the result of the comparison, this system aware the fishermen that they are about to reach the nautical border. The area is divided into two zones-warning zone and finally the restricted zone. In case it moves further and reaches the warning zone, the LCD displays warning zone at the same time SMS send to the family members. If the fishermen ignores the warning or fail to see the display and move further and automatically gets controlled by 50%. If the fishermen did not take any reaction about the alarm and move further, then the boat will enter into the restricted zone, the alarm continues to beep as before, and LCD displays Restricted area and at the same time SMS send to the family members once it touches the restricted zone, boat engine will automatically get in reverse mode and travel far from the restricted zone for about 3 seconds.

Keywords: GPS, GSM, NRF, LCD Display, Buzzer, Microcontroller, Motor driver, Tilt sensor.

1. INTRODUCTION

Global Positioning System (GPS) provides a wide range of navigation and timing services. With the combined interlock usage of GSM technology, it can be used for border security, tracking of boats and ships in the oceans and in the seas. The current issue of Indian fishermen being abducted by the Sri Lankan navy is of serious concern. This paper serves as a benefit for these people where NRF system is attached to the boat which in turn is connected to an alarm device. The GPS receives the topographic location of the boat in the sea and then triggers an alarm if the border of the country is crossed by the boat. Topographic location of a country's border can be obtained with the information of the latitude and longitude of the place and position of the boat. The borders of each country are defined in two levels. The first level extends till a certain distance in the sea and it is succeeding the national borders and just a few kilometers towards is the International borders. The additional advantage from the existing border alert systems that are already imparted is that, position of the boat can be received through an SMS to the family members from the control room through the use of GSM.

2. PROBLEM STATEMENT

At the present time there are few existing systems which help to identify the current position of the boats/ships using GPS System and view them in an electronic map. For the purpose of identification the fishermen are using the GPS72h, equipment used for the navigation in sea. It provides the fastest and more accurate method for marines to navigate, measure speed, and determines location. This system enables increased levels of safety and efficiency. It ensures whether the ship reaches its destination safely. The accurate position information becomes even more critical as the vessel departs from or arrives in port. Tilt Sensor is used in order to detect the wave nature with their

frequency. They enable the easy detection of orientation on inclination. Tilt Sensor measures the tilting position with reference to gravity NRF is used here to separate the zones with the low cost.

3. PROPOSED SYSTEM

The proposed system uses a GPS receiver system which receives signal and gives the current position of the boat. The proposed system is used to detect the border of the country through the specified longitude and latitude of the position, not only between Sri Lanka and India but all over the world. The particular layer level i.e, border can be predefined and this can be stored in microcontroller memory. The current value is compared with predefined values and if these values are same, immediately the particular operation will be done i.e, the microcontroller gives instruction to the alarm to buzzer. The system provides an indication to both fishermen and to coastal guard.

In the above fig, the ship is moving inside the sea with the normal speed for the own purpose and they don't have any idea about the borders during fishing. At that time NRF receiver receives the signal simultaneously from the sea unit. If it reaches the normal limit zone then the buzzer sound will be alerted.

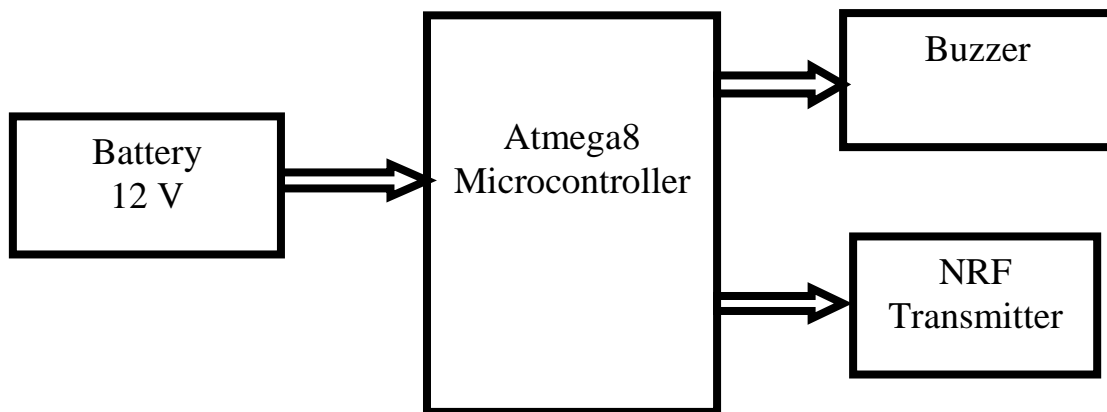


Fig: Block Diagram of Warning Zone

In which, the boat reaches the first zone that is the warning zone, NRF transmitter transmits the signal to the NRF receiver and the buzzer sound will be alerted and the GSM is used to send messages to the family members.

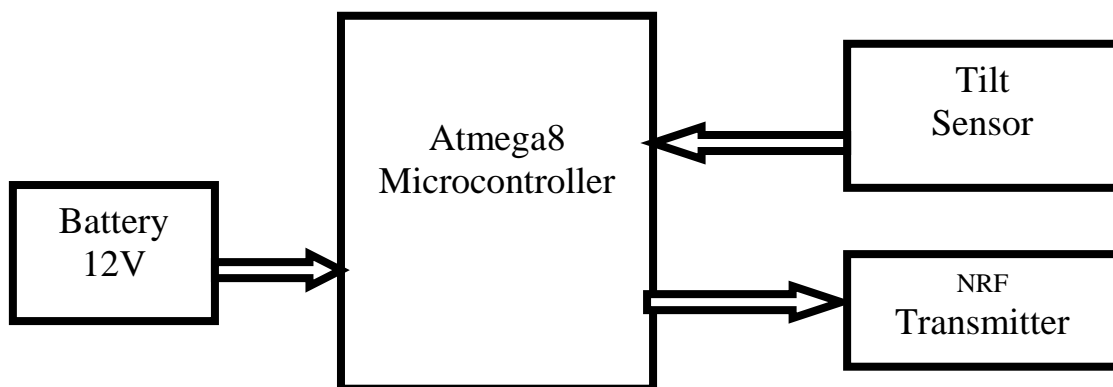
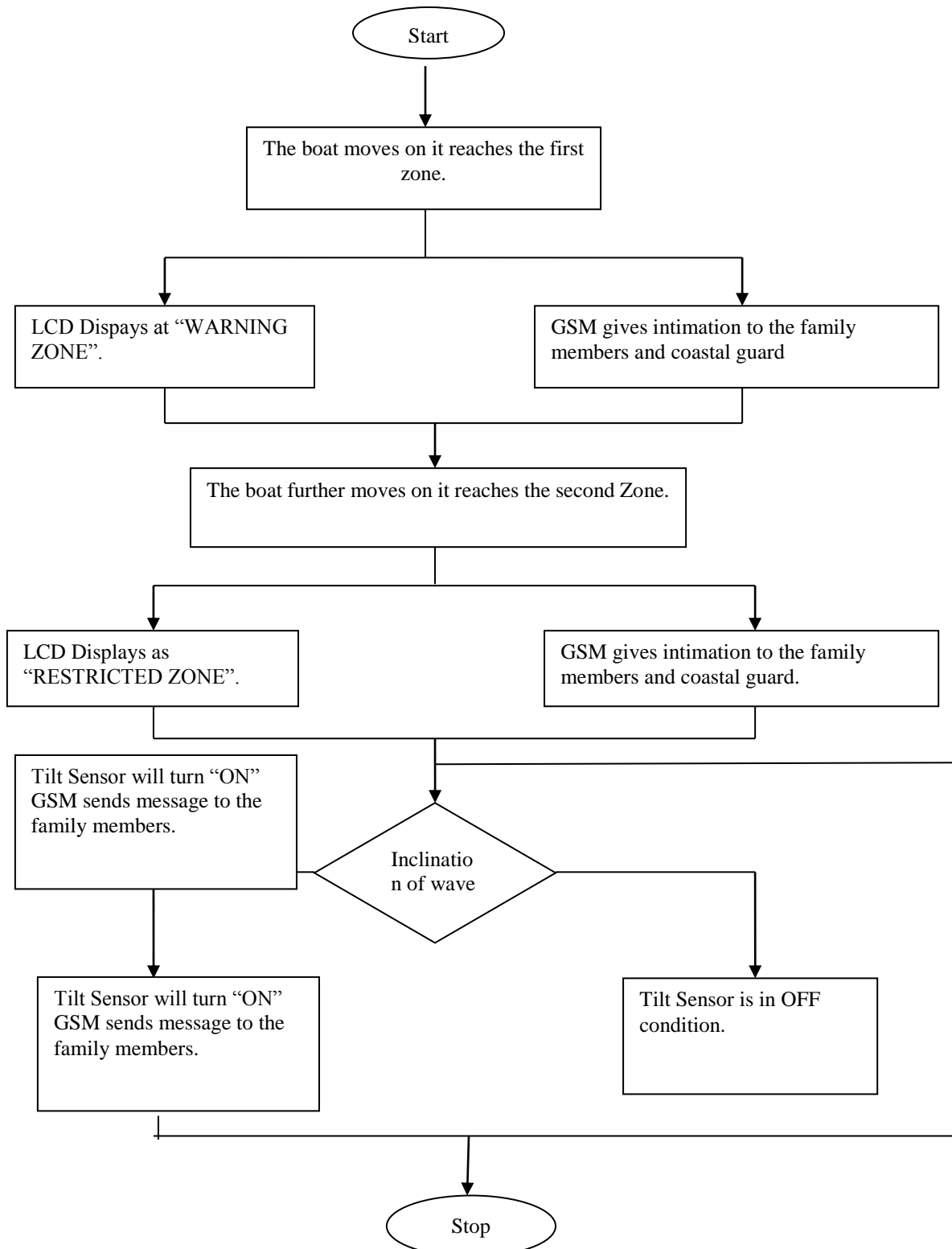


Fig: Block Diagram of Sea Unit

The boat is moving inside the sea, when it reaches the first zone the display unit will display as warning zone, simultaneously GSM gives intimation to the family members and coastal guard. Further the alert system buzzer will gives alert to the fishermen and moves on to the second zone and as like the previous the lcd diplays as restricted zone and the GSM gives intimation to the concern persons. the nature of the wave inclination is detected and the tilt sensor will act according to the wave positions and it also gives alert to the family members through GSM.

Fig: Flow chart



4. RESULT AND DISCUSSTION

Sea Unit

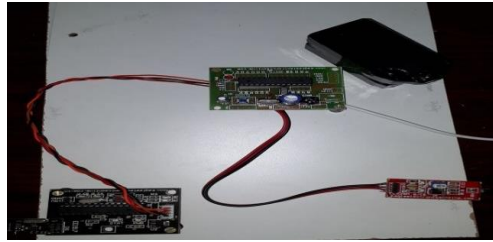


Fig: Sea Unit

In the Fig5.1, the NRF transmitter receive the signal from the microcontroller and if any changes in the inclination of the wave, the tilt sensor sends the signal to the microcontroller and the motor will get stopped and GSM sends the message to the family members and coastal guard .It will start working and the motor will get reversed. The reverse process is not in fast manner



Fig: First Zone

The boat moves on and if it reaches the first zone, then the LCD displays as WARNING ZONE and the GSM gives intimation to the family members and coastal guard along with that buzzer will turn ON and if it reaches the critical zone then the LCD displays as RESTRICTED ZONE and GSM will intimate to the family members and the alarm sound is get from the buzzer.

Ship Unit

The NRF transmitter receives the signal from the microcontroller and if any changes in the inclination of the wave, the tilt sensor sends the signal to the microcontroller and the motor will get stopped and GSM sends the message to the family members and coastal guard. It will start working and the motor will get reversed.

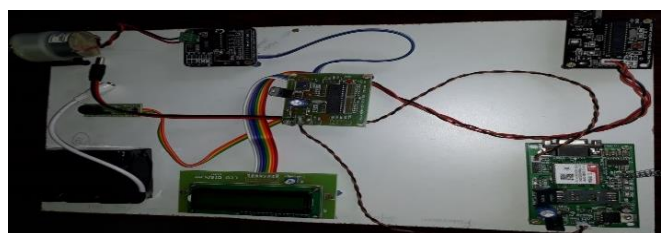


Fig: Ship Unit

5. CONCLUSION AND FUTURE ENHANCEMENT

This project helps the fisherman to identify their country border and save their life from other country navy. As it is a self security system, the fisherman don't need any help from their navy to identify the country border and therefore prevents them from entering their area. This system provides high accuracy and high precision values of Latitude and Longitude. This model proves to challenge the already existing model which just uses a GPS device to track the border and make the boat move backwards. Hence; along with saving lives it also establishes good relationship with the neighbouring countries. Piracy of ship can be controlled. By this project work we gained , self-experience and co-ordinate qualities. The knowledge of designing fabrication and team work spirit has been increased.

We can use the EEPROM to store the previous Navigating Positions up to 256 locations. We can reduce the size of the kit by using GPS and GSM on the same module of GPS navigator. We can increase the accuracy up to 3m by increasing the cost of the GPS receiver. We can use Iridium GPS for the location identification purpose .It can identify the signal in any depth and sends the signal to the satellite .then the satellite will intimation to the family members and coastal guard USING GSM.

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