

GPS & Labview Based System for Detection And Control of Maritime Boundary Intruding Boats

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Abstract— In this modern, fast moving and insecure world, it is become a basic necessity to be aware of one's safety. This project consists of two units (boat unit, border unit). In the boat, border GPS location is entered by using keypad. The rain sensor & wind sensor used to sense the rain and wind level in the boat .Thus, the complete data related to the boat is available at the controlling unit. The information about the vehicle can also be displayed on LCD and sends the GPS location, rain & wind speed to the coastal area (Server with help of RF module). If the person crosses the border then he checks the data coming from GPS and he alerted. In the coastal unit, we are using LabVIEW software to monitor and alert the fisher man in the boat.

Keywords – GPS,GSM,LabVIEW.

I. INTRODUCTION

Surveillance is a key factor to ensure safety in various fields, here motivity of fishing boats in ocean/sea are monitored for illegal intrusion in other nations boundary. Hence an effective scheme is designed to overcome this threat with Global positioning system (GPS) which provides dynamic location of fishing vessel in water and microcontroller which competes on GPS and predefined boundary locations to determine whether the boat have crossed the border or not. If so the fisherman is alerted and the message is transmitted to nearby coast guard ships through RF signals at VHF (30-300MHz) range which covers wide area. On adumbrated the patrolling units can alert the fisherman from their position or if necessary the entire movement of the fishing vessel could be controlled remotely for trespassing. This measures fixes the

cross boundary fishing problems between nations as the fisherman s are unaware about their position in water.

A sea is a large body of saline water that may be connected with an ocean or may be a large saline lake. Oceans, seas, islands and coastal areas form an integrated and essential component of the Earth's ecosystem and are critical for global food security and for sustaining economic prosperity and well-being of many national economies, particularly in developing countries. Oceans and seas cover over 70 per cent of the Earth's surface. The main theme of this paper is to save the lives of poor fishermen who is severely punishing by the other country coastal guards. This is achieved with the help of GPS and embedded system. GPS (Global Positioning System) is increasingly being used for a wide range of applications. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the earth. This paper deals on the versatility and the usefulness of a GPS

device in the sea. The main objective of the paper is to help the fishermen not to navigate beyond other country's border. If a fisherman navigates beyond the country's border, an alarm is generated indicating that the fisherman has crossed the border. Additionally, a RF transceiver interface will send a message to base station located on the sea shore indicating that a boat has crossed the border. Thus guards in the shore can assist and provide additional help to those fishermen if needed. Keeping in mind about lives of Indian fishermen, this device has been created to help them not to move beyond the border. On the whole, it

is an attempt to build a suitable device for the fishermen at a reasonably low cost.

II. DRAWBACKS OF EXISTING SYSTEM

1. Lack of awareness – There is no such system to warn the fishermen when they are about to cross the maritime boundary. These leads to loss in the both humans as well as their economic incomes.
2. No security system –lack of security alert from coast guard can also be the reason for this maritime boundary crossing issue. The coastal guards must save the fishermen when they are in danger.

III. Proposed System

Our system, mainly for fishermen are used to detect the maritime boundary between the two countries. This mainly happens when fisherman crosses maritime border of neighboring country as he is not aware of the limits in sea. In this proposed method is to achieve reliable communication at sea through RF communication. In this system, GPS module updates the dynamic locations of the boat. The controller unit which compares the GPS location value ranges with fixed border GPS location. If the fishing boat approaches near to the border GPS location, the controller unit alerts the fisherman about their location in the indicator panel, hence they can change their movement position. In some cases the fisherman intends to cross the border for owning more sea resources, this intention has to be restricted. Hence to avoid these activities the position of the boat can be notified to roaming coast guards through RF transmission at VHF range.

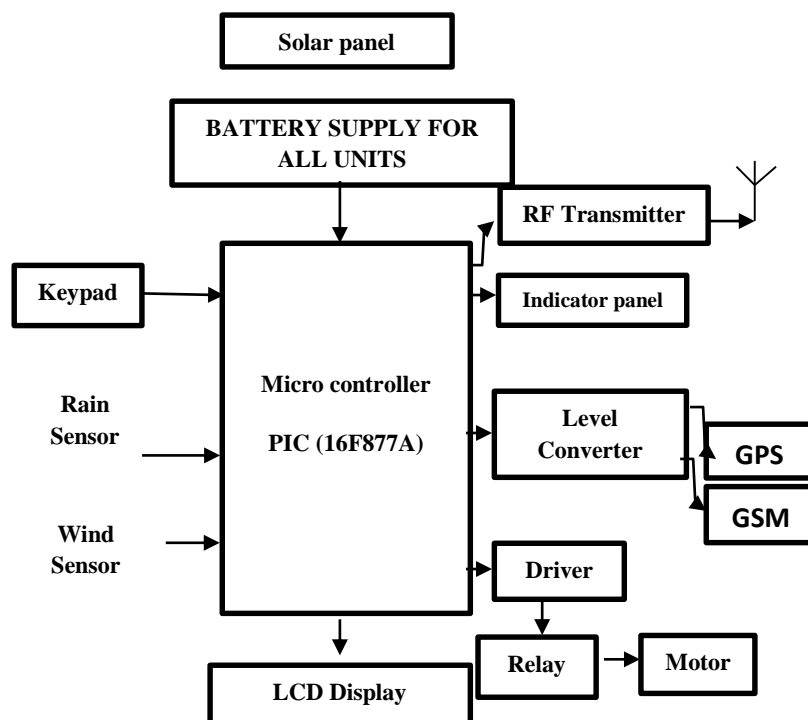
The proposed system uses a GPS concept to receive signals from the satellite and gives the current position of the boat.

The latitude and longitude of the maritime boundary. 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 coastal area. It also uses a RF transmitter to information to the base station which monitors the boats in the sea. The system provides an indication to both fisherman and to coastal guard. The coastal area (server unit) is powered with LabVIEW software to monitor & instructs the boat using RF communication (HC-12). The transmitter unit is fixed in the boat. This will continuously transmit the GPS location and the coastal will have the receiver. The receiver will receive the signal and decodes the signal and bring it to the original form which is fed to PC. In concept, wind sensor & rain sensors are used to detect the weather condition in the boat unit. And these parameters also monitored in the server. The keypad is used to sends information to the server i.e) boat brake failure or first aid help. The LCD displays the status of boat location as well as shows any received information from the server.

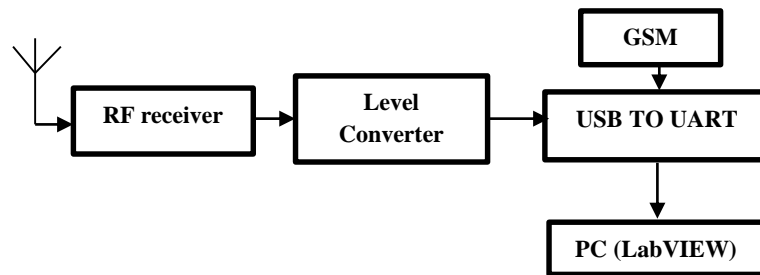
IV. BLOCK DIAGRAM

The overall operation is controlled by PIC microcontroller. This project consists of two units (boat unit, border unit). In the boat, border GPS location is entered by using keypad. The rain sensor & wind sensor used to sense the rain and wind level in the boat. Thus, the complete data related to the boat is available at the controlling unit. The information about the vehicle can also be displayed on LCD and sends the GPS location, rain & wind speed to the coastal area (Server with help of RF module).

A. BOAT UNIT:



B.SERVER UNIT:



V.LITERATURE SURVEY

1) Hanjiang Luo, Kaishun Wu et al “Ship Detection with Wireless Sensor Networks” – IEEE 2012.

They have presented an innovative solution for ship intrusion detection. Equipped with three-axis accelerometer sensors, we deploy an experimental Wireless Sensor Network (WSN) on the sea’s surface to detect ships. Using signal processing techniques and cooperative signal processing, we can detect any passing ships by distinguishing the ship-generated waves from the ocean waves. We design a three-tier intrusion detection system with which we propose to exploit spatial and temporal correlations of an intrusion to increase detection reliability. We conduct evaluations with real data collected in our initial experiments, and provide quantitative analysis of the detection system, such as the successful detection ratio, detection latency, and an estimation of an intruding vessel’s velocity

2) Dr.R. Azhagumurugan, Vignesh Kumar G Et Al “Guiding & Control Of Fishermen Boat Using Gps” – Ieee, 2017

Existing paper involves the Global Positioning Satellite System technology for tracking the position of the boat in the form of latitude and longitude. The received signal from the boat position is compared with the present value time to time. As a result of the comparison, the motor of the boat is operated in three different modes such as normal, slow and reverse. By employing this technique, the fisherman could get enough knowledge about their position which helps them to be in the safer zone.

3) Kishore Kumar Reddy. N.G, Ramakrishnan.G et al “Ensuring Fishermen Safety through a Range Based System by Trizonal Localization using Low Power RSSI” – IEEE, 2017

In this proposed system a solution is given to the problem of “Fishermen Tracking their location in the sea”. For this the sea area is divided into three zones namely; safe, intermediate and danger. The boat is allowed to roam anywhere within the safety zone. If the boat reaches the intermediate zone, a buzzer alert is given to the fisherman. If the boat reaches the danger zone, an intimation is given to the fisherman where he is supposed to reach the

intermediate zone within the specified time. Else the engine gets stopped automatically and the control of the boat goes to the control room The boat will be released only after inspection by the coast guard or after the emergency help is given. The different Ranges are identified using Received Signal Strength Indicator(RSSI).

4) K.Prabakaran, N.Raj Kumar et al “A Novel Approach Of Geofencing And Geotagging System Based Sea Border Identification Using Embedded System” – IEEE, 2013.

This existing paper deals on the versatility and the usefulness of a GPS device in the sea. The main objective of the paper is to help the fishermen not to navigate beyond other country’s border. If a fisherman navigates beyond the country’s border, an alarm is generated indicating that the fisherman has crossed the border. Additionally, a GSM transmitter interface will send a message to base station located on the sea shore indicating that a boat has crossed the border. Thus guards in the shore can assist and provide additional help to those fishermen if needed. Keeping in mind about lives of Indian fishermen, this device has been created to help them not to move beyond the border. On the whole, it is an attempt to build a suitable device for the fishermen at a reasonably low cost.

5) M Shubin Aldo, R Dinesh Kumar et al “Alert

System for Fishermen Crossing Border using Android” – IEEE, 2016

In the existing android application based system can be widely used by people in the border to find the appropriate path to reach the destination. The notification will be sent to the border security forces which act as the server to all other devices that are operated by people in ships. The application will notify the information of where the devices are being located and intimate them about the issues that occur due to opponent forces in ships to server. This can act as an incident management application to avoid conflicts at varying situations. This is processed mainly for Tamil fishermen’s who are employed in the borders. The automatic alarming system is going to be provided along with this device which alerts in case any sort of issues. This is devised in such a way that the

application can be easily been utilized by all the people in the surroundings. The application operates based on device tracking. This provides ease to operate even for illiterate people.

6) B.Kamalakaran, K.Naresh Et Al "Protecting Fishermen's By Detecting And Warning Them While Crossing Sea Borders Using Gsm And Rfid Technologies" – Ieee, 2016

This existing paper presents how the protection of innocent fishermen's from the shooting and arresting by the other country navy is possible. An Embedded technology which uses GSM (Global System for Mobile), and LPC2148 Arm microcontroller and RFID (Radio Frequency Identification) can avoid this. There are three boundaries of borders taken. Final state boundary will be the border between the two countries and other two borders before that comes under the parental country circumstances. First two border crossing will be monitored by Indian government. The fishermen's are warned by the warning devices such as speaker (a buzzer) and an LCD display while they crossing the first two borders. If warning system fails there is another option. While crossing third border, the motor in the boat turns off automatically.



Fig. 4 User interface

VI.CONCLUSION

Thus the fishermen can easily identify the national sea borders and therefore prevents them from entering their area. Thus saving their lives and providing good relationship with the neighbouring countries. Also, the piracy of ship can be easily brought under control.

VII.RESULTS AND DISCUSSION

In the olden days there is no proper system to identify the border. The fisherman while fishing they cross the border unknowingly and these may lead them to serious effects. It is so because there is no proper identification systems. During those days they use magnetic compass and other natural identification system. Because of the inadequate knowledge of the fisherman, they face serious consequences while crossing the border. These are the problems that are faced in the present system. By overcoming this it is possible to introduce new ideas for identifying the border. The best area for fishing. On an account to it is able to give warning from the base station that some natural calamities is about to happen. cost and it will be more advantage to the fisherman. Even after these services provided to fishermen, there are some future enhancements is given here. It is able to intimate the fishermen about the boundary before some kilometers of

distance by feeding the latitude and longitude values of places before the boundary into the PIC and an automatic engine disable system can be implemented if the fishermen are going to reach the boundary or the speed of the boat can be gradually controlled depends on their further navigation to boundary.

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