Fishermen Border Alert System

Dr.S.Saravanan M.E., Ph.D[1], S.Karthick M.E[2], Rajeshkumar.K[3], Sriramachandran.S[4], Surjeethkumar.P[5]

Professor& Head, Department of EEE, Muthayammal Engineering College, Rasipuram, Tamil Nadu, India [1]

Assistant Professor Department of EEE, Muthayammal Engineering College, Rasipuram, Tamil Nadu, India[2]

Student, Department of EEE, Muthayammal Engineering College, Rasipuram, Tamil Nadu, India [3,4,5]

ABSTRACT *:* In this modern fast moving and insecure world, it has become a basic necessity to be aware of one's safety. Maximum risks occur for fishermen in situations where they travel on a boat for fishing. In some situations, they should not move after some point and they should not enter into other countries area. The application can be extensively used by people in the Sea border to find the 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 and also notify in voice. 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 smart engine and SMS alert system. This provides ease to operate even for illiterate people. There is a real necessity in designing a system that can track the vehicle and send the information about the vehicle to the concerned person and alert the fishermen also.

KEYWORDS: GPS, GSM, CDMA, RELAY.

I. INTRODUCTION

Tamil Nadu fishermen even today invoke the historical rights and routinely stay into the International Maritime Boundary Line (IMBL) for fishing. From Tamil Nadu about 18,000 boats of different kinds conduct fishing along the India-Sri Lanka maritime border. Sri Lanka and India seaside nations are isolated by their sea borders. In Tamil Nadu about 20,000 vessels make spinning in the Bay of Bengal. The main aim is to give a well equitable user friendly environment for Indian Fisherman to handle hazardous situation with the help of engine control. But by accidentally crossing the border without knowledge, they get shot by the Lankan navy. This leads to loss in the both humans as well as their economic incomes. Identify the current position of the boats/ships using GPS System and view them on an electronic map. For the purpose of identification the fisherman are using the GPS72h, equipment used for the navigation in sea. It provides the fastest and most accurate method for mariners 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. If the fisherman ignores the warning or fail to see the display and move further and if the boat enters the zone nearer to the restricted zone the alarm will turn on and the speed of the boat engine automatically gets controlled by 50%. If the fisherman 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 once it touches the restricted zone, the boat engine gets off by the control of fuel supply to engine.

II. WORKING

The GPS Modem will continuously give the signal which determines the latitude and longitude and indicates the position of the fishermen to them. Then it gives the output which gets read and displayed in the LCD. The same data is sent to the mobile of the fisherman and simultaneously the same data is sent to the Sea border security. An EEPROM/SDCARD is used to compare the data, received by GPS receiver. The hardware which interfaces with

microcontroller is LCD display, GSM modem and GPS Receiver.GPS (Global Positioning System) is increasingly being used for a wide range of applications. It provides reliable positioning, navigation, and timing services to world wide users on a continuous basis in all weather, day and night, anywhere on or near the Earth. 28 satellites inclined at 55° to the equator orbit the Earth every 11 hours and 58minutes at a height of 20,180 km on 6 different orbital Lanes and each one of these satellites has up to four atomic clocks on board. All we require is an accurate clock. By comparing the arrival time of the satellite signal with the on board clock time, at which the signal was emitted, the latitude and longitudinal degree of the boat's location is determined. The current design is an embedded application, which will continuously monitor a moving Boat and once the boat goes beyond the level of the defined layer the particular operation will be done. The additional advantage from the existing border alert systems that are already imparted is that, the interlock of the GSM where minute by minute position of the boat can be received through an SMS to the family members from the control room.

III. METHODOLOGY

The GPS device will frequently give the signal which determines the latitude and longitude and indicates the position of the boat and it is displayed in the LCD.GPS provides consistent positioning, navigation, and timing services to users on a continuous basis in every day and night. GPS store the storage of the maritime position. While comparing the previous maritime restricted position and current position and result will be the latitude and longitudinal degree of the boat's location is determined If the boat nearer to the restricted zone ,automatically warning message will be send to the LCD display which is in boat. The warning messages are sending by using a GSM Modem. A microcontroller is interfaced serially to a GSM modem and GPS receiver. The block diagram of the entire system is given.
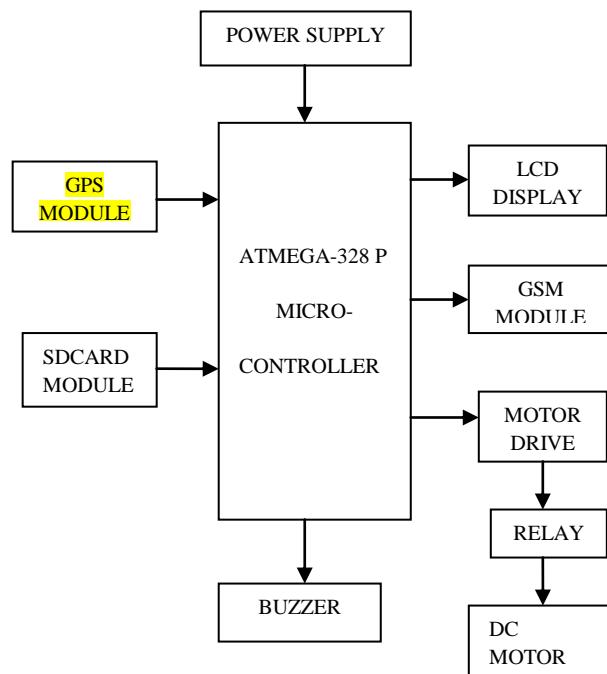
Then the fishermen fails to ignore the warning and they move to reach the restricted zone automatically engine gets off by means of relay and send through the message to the coastal guard. The part of seas as towers cannot be placed in middle of the ocean so it place in coastal control office. Thus the coastal continuously receive the GPS information from the GPS Address. The main aim of this GSM system is to ensure continuous monitoring of each boat and information given to the coastal office. When boat crosses border, the stored message adjacent to with compared position and message sent to the desired authority person by using GSM module.

IV. EXISTING SYSYTEM

The systems are GPS and RADAR based which were run over by coastal guards. Other systems include such as the android application, WSN based (RSSI). But the above systems are not possible due to its short range, high cost, time efficiency, etc. The major drawback of this existing system is that they never provided a accurate way to control the speed of the outboard motor which is used by our common fishermen. All these defects are overcome in our proposed work. For the purpose of identification the fisherman are using the GPS72h, equipment used for the navigation in sea. It provides the fastest and most accurate method for mariners 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.

V. PROPOSED SYSTEM

The proposed system is used to denote the boundary to the fishermen and to stop the boats from trespassing into the border. It is done by GPS which receives a signal from the satellite and gives the current position of the boat. The Arduino processor is programmed to compare the current longitudes and longitudes with the stored longitudes and longitudes of the border in SDCARD. The particular layer level i.e. border can be predefined and this can be stored in memory. The current value is compared with predefined values and if these values are same, immediately the particular operation will be done. The microcontroller gives instruction to the alarm to buzzer. It also uses a message transmitter to send message to the base station which monitors the boats in the sea. Each boat has a unique number through which a record of how many boats is monitored in the control station. Thus guards in the shore can reach out the fishermen quickly. Our system provides an indication to both the fisherman and to the coastal guards. This system alerts the fishermen and the coast guard about the position of the boat. Further attempts of crossing the border neglecting the alert can be prevented by controlling the engine through the engine control unit.

Table 1. Table of latitude & Longitudes

Positions	Latitude	Longitude
Location 1	12′ 05′.0 N	82′ 03′.0 E
Location 2	12′ 05′.8 N	82′ 05′.0 E
Location 3	12′ 05′.4 N	82′ 09′.5 E
Location 4	12′ 33′.0 N	82′ 46′.0 E
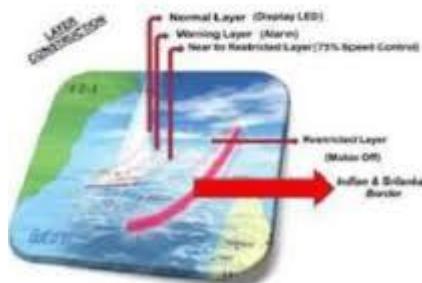
Latitude and Longitude

VI. IMPLEMENTATION

The GPS device will frequently give the signal which determines the latitude and longitude and indicates the position of the boat and it is displayed in the LCD. GPS provides consistent positioning, navigation, and timing services to users on a continuous basis in every day and night. GPS store the storage of the maritime position. While comparing the previous maritime restricted position and current position and result will be the latitude and longitudinal degree of the boat's location is determined If the boat nearer to the restricted zone ,automatically warning message will be send to the LCD display which is in boat. The warning messages are sending by using a GSM Modem. Then the

fishermen fails to ignore the warning and they move to reach the restricted zone automatically engine gets off by means of relay and send through the message to the coastal guard. A microcontroller is interfaced serially to a GSM modem and GPS receiver.
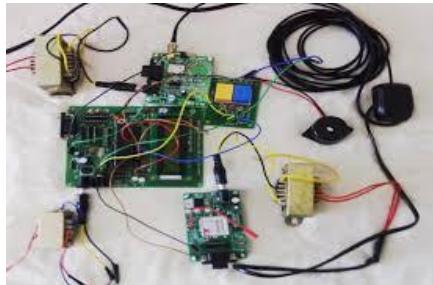
The main aim of this GSM system is to ensure continuous monitoring of each boat and information given to the coastal office. When boat crosses border, the stored message adjacent to with compared position and message sent to the desired authority person by using GSM module.

VII. HARDWARE COMPONENTS

7.1 GSM MODULE

GSM network operate in a number of different carrier frequency and its frequency up to900MHz or 1800MHz. GSM module is utilized for transmission of message looking for help. The GSM makes use of narrowband Time Division Multiple Access (TDMA) technique for transmitting signals. It cannot be utilized as a part of seas as towers cannot be placed in middle of the ocean so it placed in coastal control office. Thus the coastal continuously receive the GPS information from the GSM with help of CDMA. The main aim of the GSM system is to ensure continuous monitoring of each boat and information given to the coastal office. When boat crosses the border, the stored message adjacent to with compared position and message sent to the desired authority person by GSM module.

7.2 POWER SUPPLY

The power supply is provided from dynamo of the boat. The DC power supply with both positive and negative output voltages from battery is used and Arduino operates at low power. A relay is an electrically operated switch. Where many relays are used to an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid state relays .Relays are used where it is necessary to control a circuit by a low-power signal where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers they repeated the signal coming from one circuit and retransmitted it on another circuit

7.3 BUZZER

If the boat nearer to the restricted area the alarm will keep on increasing by means of pulse width modulation. It ranges from (0-255).

7.4 GPS MODULE

A GPS navigation device is any device that receives Global Positioning System (GPS) signals for the purpose of determining the device's current location on Earth. GPS devices provide latitude and longitude information, and some may also calculate altitude. GPS devices are used in military, aviation, marine and consumer product applications. The Global Positioning System (GPS) is a space based navigation system that provides location and time information in all weather conditions.. The GPS detects the latitude and longitude of the boat's position and sends the data to the microcontroller.

7.8 BOUNDARY BETWEEN INDIA AND SRI LANKA

The boundary points are marked above. These points should be stored in microcontroller. The computation is done in microcontroller with these points. Thus vessel crossing the border is being calculated.

7.9 DISCUSSION

The GPS modem will continuously give the signal which determines the latitude and longitude and indicates the position of the fishermen to them. Then it gives the output which gets read and displayed in the LCD. The same data is sent to the mobile of the fisherman and simultaneously the same data is sent to the sea border security. An EEPROM is used to store the data, received by GPS receiver. The hardware which interacts with microcontroller is LCD display, GSM modem and GPS receiver.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. Microcontrollers (Programmable Interface Controllers), are electronic circuits that can be programmed to carry out a vast range of tasks .They are found in most electronic devices such as alarm systems, computer control systems, phones, in fact almost any electronic devices. Microcontrollers are relatively cheap and can be bought as pre-built circuits or as kits that can be assembled by the user. Microcontroller receives the data from the GPS receiver through RX and TX of Arduino. The data received contains many details along with latitude and longitude. The latitude and Longitude of the current position is separated from the detailed data from GPS. The current positions are compared with already stored latitude and longitude of countries boundary locations. At first the latitude is compared with stored latitude which identifies if the current position is located near to the boundary. The latitude and Longitude values for each boundary are stored in separate text files. Depending up on the text files matching Arduino will change the operation. [10]The current position received

from GPS is compared with stored values. The latitude S1 is compared with stored latitudes. If latitude match, then adjacent latitude and longitudes (X1, Y1 and X2, Y2) are retrieved from stored table and compared and simultaneously.

VIII. CONCLUSION

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 are no proper identification systems. 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 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. So this project enable the people are secure to fishing the border areas.

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