Smart Engine Based Border Alert and Security System for Fishermen

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Abstract— *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.*

Keywords: Smart Engine, RF, Wireless, SMS

1.   INTRODUCTION

The 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. 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. We have developed a system which eliminates such problems and saves the lives of the fishermen.

2. WORKING PRINCIPLE

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 interfaces with microcontroller are 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 worldwideusers 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 onboard 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. For doing so an AT89c51microcontroller is interfaced serially to a GSM MODEM AND GPS receiver. The borders of each country are defined in two levels. The first level extends till a certain distance in the sea and it is called as the National border of the country. 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, 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 through the use of DGPS. But, earlier systems employed infrared radiations which proved to be quite disadvantageous and difficult to use. The DGPS report is also sent to the control room from which the location of the boat can be tracked, in case it is lost in the seas. The paper uses a GPS device, GSM, microcontrollers and an alarm system to alert the fishermen whenever the border is crossed by unauthorized means.

3. LITERATURE SURVEY

D.Jim Isaac et al [1] the paper titled as "Advanced border alert system using GPS and with intelligent Engine control unit "In our system using GPS and GSM, where GPS is used to find the location of the boat. If the boat nearer to the boundary primarily it warning for a fishermen with the alarm and emits the location of the boat to the nearest coast office via GSM communication. When it further nears the maritime boundary an interferer is sent to the Engine Control Unit which controls the speed

of the engine with the help of the electronic fuel injector. and its low cost maritime. By this method, we can alert the fishermen and also monitor them thereby avoiding banned activities such as smuggling, intruders, etc

S. Kiruthika et al [2] the paper titled as" A Wireless mode of protected defence mechanism to mariners using GSM technology "In our system using only GPS to receive the information from the satelliteand stored border locations to detect whether the boat has crossed the border or not which covers wide area.

Naveen Kumar.M et al [3] the paper titled as" border alert and smart tracking system with alarm uses DGPS and GSM and this system uses DGPS to track the location of the boat and to activate an alarm which consists of a Piezo-buzzer, when the border is move toward or crossed. Also, in addition, the DGPS information is sent to control office, and also the information is sent to the family at regular time intervals that are in expectation about their family member's safety.

Implementation of Maritime Border Alert System: This paper proposed to help the small scale fishermen for safe navigation in maritime and then preventing them from entering other country border line. Data collection unit consists of GPS thus provided the information of location based on the position of the boat and transmitter. The processing unit fetched with already known details of border betweenthe countries, and comparison is being done with known data and current position data. The controllingunit will makedecision in order to alert the fishermen and coast guards. [4].

E. Arm Based Fishing Boat Security System: In this paper, the idea is to help the fishing boat for safe navigation using GPS. When the fishermen boat crosses the border limit, the controller units generates the alarm signal. ARM processor is used in controller unit. In addition to it, voice alert is also generated. ZIGBEE module is used instead of GSM module for continuous signal transmission. If so the boat is further moving towards the border, DC motors will be turned off. Thus the system provides the maritime security for fishermen. [5]
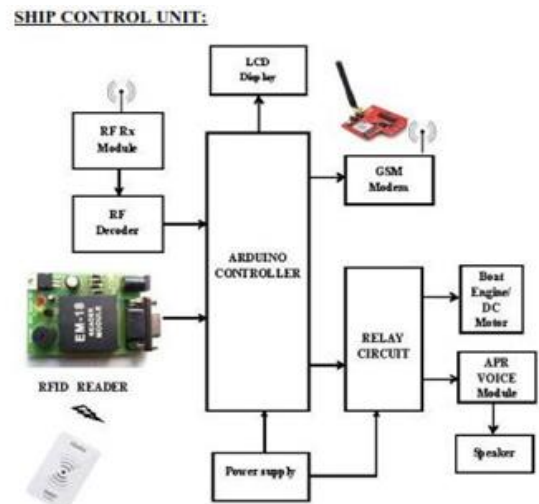
4. EXISTING SYSYTEM:

At present there are many proposed systems which help to identify the current location for the vessel. 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) [1]. 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 works.
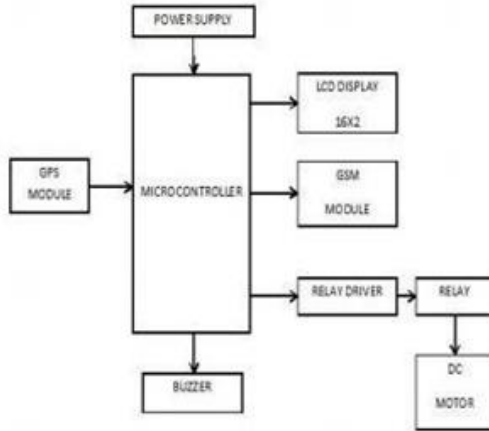
5. PROPOSED SYSTEM:

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 arm processor is programmed to compare the current longitudes and longitudes with the stored longitudes and longitudes of the border. Each boat has a unique number through which a record of how many boats is monitored in the control station [2]. Thus guards in the shore can reach out the fishermen quickly. Our system provides an indication to both the fisherman and to the coastal guard. Thus 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.

6. IMPLEMENTATION

SHIP CONTROL UNIT:

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. The hardware which interfaces with microcontroller, LCD display, GSM modem and GPS Receiver. 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 message are send 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 block diagram of the entire system is given

part of seas as towers cannot be placed in middle of the ocean so it place in coastal control office. Thus he 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.

7. HARDWARE COMPONENTS

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 GPS address. The main aim of the GPS 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.

POWER SUPPLY

The power supply is provided DC motor and microcontroller. The DC power supply with both positive and negative output voltages, a centre-tapped transformer is used and Ardino 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
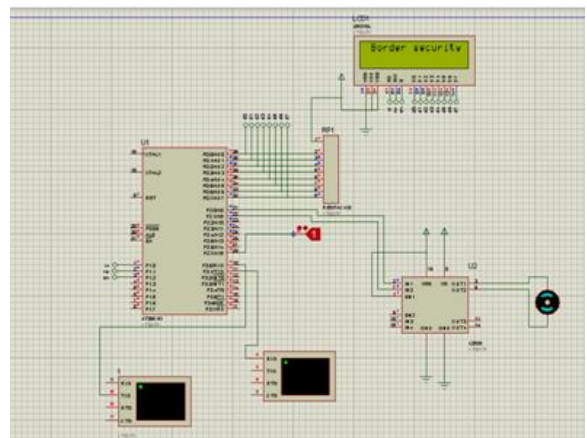
BUZZER

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)..
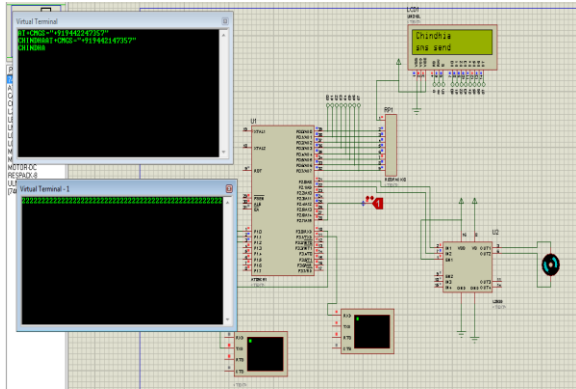
AT COMMANDS:

The Microcontroller uses the AT commands to control the GSM modem. GSM modems and normal Hayes modems support a common set of AT commands. GSM modem supports an extended set of AT commands which are defined in the GSM standards.
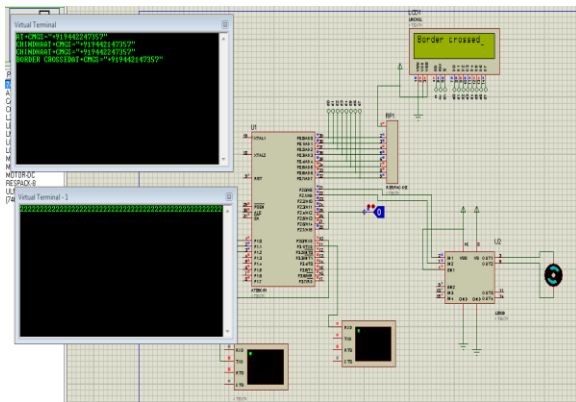
8. SOFTWARE RESULTS

The circuit can be implemented in the proteus software and three kinds of windows will be obtained.

The above diagram shoes the schematic view of the 8051 module in Proteus, where two kinds of results will be obtained.

The above schematic diagram is the simulated output of the software when the boat has been started. when the boat was started it will display the result as 'Boat started' and the sms will be sent.

The above diagram is the simulated output of the Proteus software when the boat crossed the border. The results will be displayed as 'Border crossed'.

9. 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.

10. FUTURE SCOPE

The process of directing the fishermen can be enhanced by placing the engine control unit system in the coastal office. They remotely control the engine to restart the boat for the safety of fishermen.

11. REFERENCES

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