Design of Border Alert System for Fishermen

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Abstract

Increasing tensions across the borders cause much havoc between the two countries. Fishermen from one country are being abducted by other navy for crossing the border which is unintentional most of the times. This project deals with a system of tracking the location of the boat using GPS and to trigger an alarm which consists of a buzzer, when the border is approached or crossed. This paper aims at providing a system that will alert the fishermen well in advance and ensure maximum safety and peace at the borders and also notify the family members.

Keywords: GPS, GSM, Pic Controller, mikroC PRO, Border Security

I. INTRODUCTION

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. 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.

II. NECESSITY OF STUDY

In this paper deals with a marine traffic simulation based on an autonomous ship cluster behavior model in which each vessel's maneuvering decision is made by taking into consideration of four independent forces that act on it, namely, goal attainment, centripetal, collision avoidance, and following forces. The compositional force, which determines each vessel's behavior, is calculated based on the four forces with a specific weight function for each. The weight functions in the present paper were designed so that they could reflect ship operator’s individual differences with respect to safety precaution by introducing smooth, non-linear curves, and the same simulation result could be obtained when the ratio of the outputs of these four functions were the same.

III. DESCRIPTION OF EXISTING PROBLEMS

The Indians have not been fishing at long distances deep in the Indian Ocean away from the contentious Sri Lankan maritime zone because they do not possess multi-day fishing crafts. The Indian government has undertaken a census of fishermen in western Gujarat, preparing a database of information on fishermen and their boats to be used for more effective monitoring of fishing activities in Indian territorial waters alongside Pakistan and to prevent boats from straying into Pakistani waters. The Indian Coast Guard has also begun installing tracking devices in fishing boats operating in the waters off western Gujarat to maintain surveillance and to stop them from straying into Pakistani waters. Developed by the Indian Space Research Organization, the tracking device has the ability to send out alerts for fires on board, a sinking vessel, a medical emergency and when the boat is apprehended by another country.
Ports that are made use are Port B, Port C and Port D. Port B is initialized to LCD where write is made high. Port C is connected to GPS and GSM. Inbuilt transmitter and receiver of PIC16F877A is connected to GSM and for communication of data between GPS and GSM, SOFT_UART library is used. Data from GPS is sent to GSM through SOFT_UART. As shown in Fig. 1.1
V. MATHEMATICAL AND HARDWARE DESCRIPTION

The output of a bridge-rectifier with capacitor filter may be called unregulated dc since it varies with changes in load current and line voltage. Most of the electronic circuits require a stable dc voltage for their proper operation. Hence, it is necessary to regulate the output of full-wave rectifier with filter. IC 7805 is a 5V voltage regulator that restricts the voltage output to 5V and draws 5V regulated power supply.

![Diagram of Power Supply]

\[ V_{DC} = 12V, I_{DC} = 1A \]  
\[ V_{DC} = 2V_m/\pi \]  
\[ V_m = 18.85V \]  
\[ V_{DC} = V_m - I_{DC} / (4fC) \text{ where } f = 50Hz \]  
\[ C = 729.927 \mu F \Rightarrow C = 1000 \mu F \]

\[ C = q / V_C \text{ where } V_C \text{ is capacitor voltage, } V_C = q/C \text{ where } q = I \times t \]

\[ t = 1/f \text{ hence } t = 1/50 = 20ms, \text{ Then, } q = 1 \times 20m = 20mC \]

\[ V_C = 20m / 1000\mu = 20V, \Rightarrow \text{ Capacitor } = 1000 \mu F / 25V \]

VI. GSM SPECIMEN AND SOFTWARE DESCRIPTION
Piezo Buzzer is a sound generator that is used in our project to indicate that a ship/boat the maritime boundary. Relay is a device that allows you to control a high-current electrical load with a low-current electrical ‘signal’. An Electric DC motor is a machine which converts electric energy into mechanical energy.

The Code Editor is an advanced text editor fashioned to satisfy the needs of professionals. General code editing is same as working with any standard text-editor, including familiar copy, paste and undo actions, common for windows environment. Advanced Editor Features include adjustable syntax highlighting, code assistant, parameter assistant, auto complete, auto correct, bookmarks and goto line options. The Code Explorer is placed to the left of the main window by default, and gives a clear view of every declared item in the source code. It is possible to jump to a declaration of any item by clicking to it, or by clicking the Find Declaration icon. To expand or collapse tree view in Code Explorer, use the Collapse/Expand All icon.

In case that error was encountered during compiling, the compiler will report them and won’t generate a hex file. The Error Window will be prompted at the bottom of the main window by default. The Error Window is located under the message tab, and displays location and type of errors compiler has encountered. The compiler also reports warnings, but these do not affect the output; only errors can interfere with generation of hex. Double click the message line in the Error Window to highlight the line where the error was encountered.
Fig. 1.8: Description of Error Window with Error

Fig. 1.9: Description of Error Window without Error

The PICkit 2 Development Programmer/Debugger is a low-cost development programmer. LCD is interfaced with PIC16F877A to PORT B as shown in the Fig. It makes use of pins RB0, RB1, RB2, RB3, RB4 and RB5 connected to D4, D5, D6, D7, RS and EN respectively. It makes use of library file “LCD” from Library Manager. LCD is an output in our project; hence TRIS register with respect to PORT B is initiated with zero.

VII. IMPLEMENTATION
VIII. APPLICATIONS

- We can use this device also as bomb detector.
- Location of any lost vehicle could be found.
- By keeping the kits in the entire boats and by knowing the locations of all the boats we can use our kit to assist the traffic.

IX. CONCLUSION

At present, the fishermen have to keep watch the maritime border, which cannot be easily separated as land region. If they cross a certain limit on the sea, they have to pay the penalty or get arrested by the naval guards of the neighboring countries. This project generates alarm if the fishermen are just about to cross the border. The simple circuitry 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. It aims at solving relevant social problems with the appropriate use of satellite for geographical location data through wireless networking. Also, our project will be used for advancement of coastal border averment. It will thereby, 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.

REFERENCE