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Marine Boundary Alert System for Fishermen

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Abstract— The aim behind this paper is to save the lives of the poor fishermen from crossing marine boundary. The boundary detection technique does not allow the fishermen to cross their country border. When they reach the country limit an alarm will be raised and the message will be sent to the base station at the shore and the boat will be controlled by the base station. The new system adapts the embedded architecture based on PICMICRONTROLLER and ANDROID Phone. The PICMICRONTROLLER is used as the core processor because it has high definition, less power consumption.

Keywords— Microntroller, Bluetooth module, Android phone, DC Motor, Driver IC(L293Ds), Emergency switch.

I. INTRODUCTION

The Island like Sri Lanka, peninsula like India and the coastal countries are separated by their maritime borders. The people livelihood in the coastal area of those countries purely depends on fishing occupation in the sea. Crossing the border is serious offence. Due to unknowing boundary limit, the fishermen used to rude the maritime borders. Once they rude the border, they get arrested or killed by the relevant navy and they are being abducted and their boats are being captured by the neighborhood countries coastal guards. In such situation the lives of fishermen continue to be difficult. In order to avoid this issue, there is need for producing significant realization among our fishermen to avoid boundary crossing. GPS, GSM and Wireless Networks can be the best choice for addressing the maritime border crossing issue. The proposed system is used to devise a low cost alert system for fishermen that gives an alert when the boat/ship crossed beyond other country's border. It helps the fishermen not to go afar of border. If the fishermen violate the border agreement, an alarm(danger signal) is generated indicating that the fishermen has violated the rule. In addition, a Global System for Mobile Communication supported TX interface will send (forward) a message to base station located on the shore indicating that a vessel has crossed the border and the boat/ship will be controlled by the base station. 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 Indian border.

II. BLOCK DIAGRAM WITH DISCRIPTION

Components of the marine boundary alert system for fishermen are:

- PIC-Microcontroller
- Bluetooth module
- Android phone
- LCD Display
- DC motor
- Buzzer
- LED
- Driver IC L293D
- Emergency switch

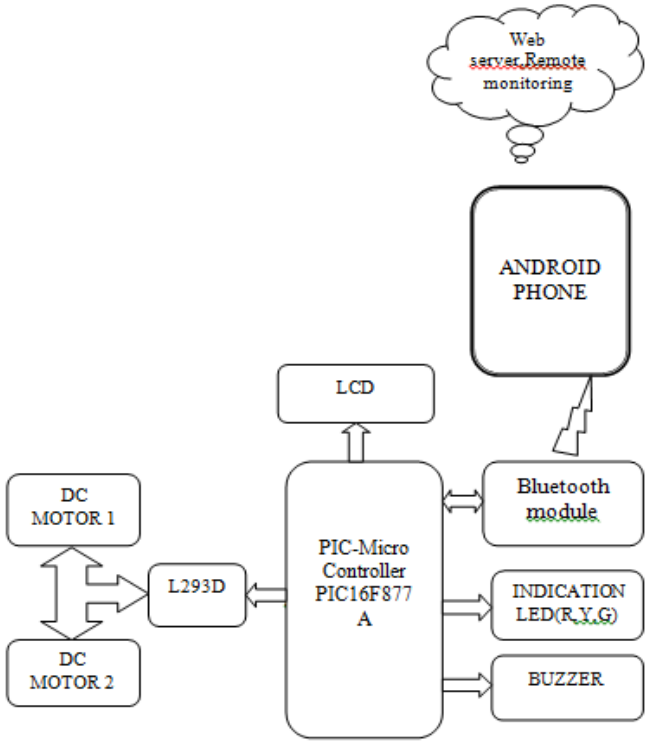

Fig 1: Block Diagram

A. *Microcontroller(Pic16F877A) :*

The PIC microcontroller PIC16F877A is one of the most renowned microcontrollers in the industry. This controller is very convenient to use, the coding or programming of this controller is also easier. One of the main advantages is that it can be write-erase as many times as possible because it use FLASH memory technology. It has a total number of 40

pins and there are 33 pins for input and output. PIC16F877A is used in many PIC microcontroller projects. PIC16F877A also have many applications in digital electronics circuits.

B. *LCD Display:*

LCD (Liquid Crystal Display) is used in all the electronics projects to display the status of the process. A 16x2 alphanumeric LCD is most widely used module of LCD nowadays. There are several others type of LCD available in market also.

The reason for choosing LCD over other display component or devices is that it is

- Low cost
- Easily programmable
- Large number of display character etc.

C. *Bluetooth Module:*

The Bluetooth module HC-05 is a MASTER/SLAVE module. By default the factory setting is SLAVE. The Role of the module(Master or Slave) can be configured only by AT COMMANDS. The Slave modules cannot initiate a connection to another Bluetooth device, but can accept connections. Master module can initiate a connection to other device.The user can use it a simply for a serial port replacement to establish a connection between MCU and GPS, PC to your embedded project, etc.

D. *Android Phone :*

An Android cell phone is a cell phone running the Android OS. A typical Android cell phone is a smart phone with touch screen interface, multiple connectivity options, internet browsing capabilities.

E. *DC Motor :*

A DC Motor is a mechanically commutated electric motor powered from direct current. This paper gives idea to use three Johnson's metal geared motors. Two motors having rating12v,

30 rpm for controlling robotic wheel. Another motor12v, 1000 rpm for grass cutting purpose. High starting torque required for this device so DC series motor will fulfill the requirement.

F. *Driver IC(L293D) :*

L293D is a dual H-bridge motor driver integrated circuit(IC). Motor drivers act as current amplifiers since the take a low current control signal and provide a high current signal. This higher current signal is used to drive the motors. L293D contains to inbult H-bridge driver circuits. In this common mode of operation, two DC motors can be driven simultaneously, both forward and reverse direction.

G. *Buzzer:*

Piezo buzzer is an electronic device commonly used to produce sound. Light weight, simple construction and low price make it usable in various applications like car/truck reversing indicator, computers, call bells etc. Piezo buzzer is based on the inverse principle of piezo electricity discovered in 1880 by Jacques and Pierre Curie. It is the phenomena of generating electricity when mechanical pressure is applied to certain materials and the vice versa is also true. Such materials are called piezo electric materials. Piezo electric materials are either naturally available or manmade. Piezoceramic is class of manmade material, which poses piezo electric effect and is widely used to make disc, the heart of piezo buzzer. When subjected to an alternating electric field they stretch or compress, in accordance with the frequency of the signal thereby producing sound.

Advantages

1. Provide great safety to fishermen.
2. Saves the lives of people.
3. Manual control.
4. System provides emergency help.

III. LIMITATIONS

1. Compulsory internet requirement.
2. Weather dependent so during rainy season its efficiency will get decreased.

IV. FUTURE SCOPE

1. The system can be also helpful for avoiding terrorist activity.
2. In future this idea can be enhanced by using smart watches and satellite phones.

V. CONCLUSION

In this way the proposed system will make us know the maritime boundary identification for fisherman using PIC micro controller, GPS and GSM of Android phone which will be present with the proposed system. The fisherman, while navigating crosses the maritime boundary, unknowingly as they are unable to visualize it in the ocean which causes loss to its life. Through this system a Android Application based security system is provided to the fisherman so that they can find out when they are in danger. Thus the fishermen can easily identify the sea borders and therefore prevents them from entering their area. Thus saving their lives and providing good relationship with the neighboring countries.

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