Portable Life Protection System for Fishermen

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ABSTRACT

Every day we hearing news about fishermen killed or imprisoned when they cross the national sea border inadvertently. The most outstanding problem is being going on for trans border fishing. Surveillance is critical problem for border control or commercial facilities. The sea border between the countries is not easily identifiable, which is the main reason for the cross border cruelty. From the fisherman point of view, straying takes place inadvertently due to sheer ignorance about maritime boundaries. This proposed system awares the fisherman that they are about to reach the nautical border. The area is divided into three zones fatal zone, warning zone, zone near to the fatal zone and finally the restricted zone. This system saves the life of the fishermen by making an alarm system and a motor controlled device, which is to be mounted in the boat/ship. If fishermen navigate near country's border, an alarm is generated indicating that the boat/ship is near the border of our country. The motor turns off if the boat touches the border. Here we have designed a system using embedded system which protects the fishermen by notifying the country border to them by using Global Positioning System (GPS) and Global system for mobile communication (GSM).

Keywords : Microcontroller, Motor, GPS(Global Positioning System), GSM(Global System for Mobile Communication)

I. 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. The global positioning system is a satellite-based navigation system consisting of a network of 24 orbiting satellites that are eleven thousand nautical miles in space and in six different orbital paths. GPS has become an indispensable aid to navigation around the world, and an important tool for map-making and land surveying. It also provides a precise time reference used in many applications including scientific study of earthquakes, and synchronization of telecommunications networks. There are many applications of GPS that are widely being used. This project aims at another possible application of GPS which can aid small scale fishermen from accidentally crossing over into international waters. In the older days there was no communication between the fishermen boat and the coastguard section. So there was so many accidents took place in the middle of the ocean. Thus this system provides a very simple and a cost effective system which can be used by fishermen and other people to find out their position. Further the people at the ground especially the family and friends of the fishermen can be updated with latest position of the fishermen by the concerned authorities. This brings a huge sigh of relief to the family waiting on the shores. If fishermen navigate near country's border, an alarm is generated indicating that the boat/ship is near the border of our country. With the help of GPS, they would find the location of the boat. At the present time there are few existing systems which help to identify the current position of the boats/ships using GPS System and view them on an electronic map. The proposed system provides an

indication to both fisherman and to coastal guard. Thus it saves the lives of the fisherman and alerts the base station to provide help.
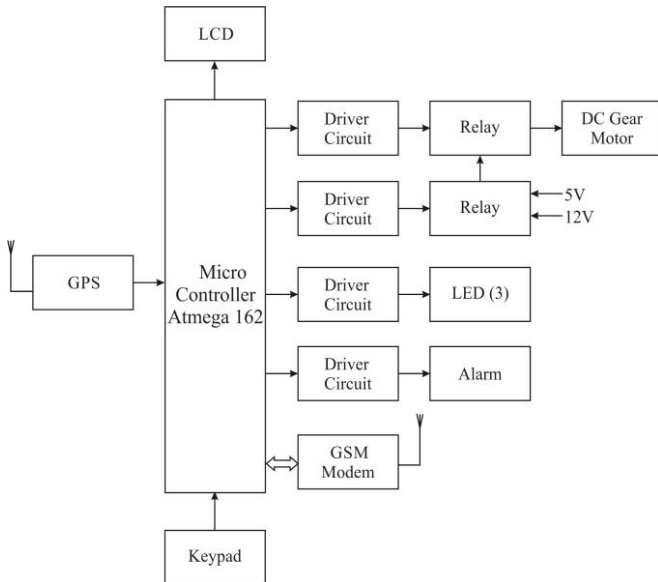
II. METHODS AND MATERIAL

Experimental Work

Figure 1. Block Diagram

Hardware Materials

Our proposed consists of six major units which are discussed below as

1. Atmega 162

The high-performance, low-power Microchip 8-bit AVR RISC- based microcontroller combines 16KB of programmable flash memory, 1KB SRAM, 512B EEPROM, and a JTAG interface for on-chip debugging. The device supports throughput of 16 MIPS at 16MHz and operates between 2.7-5.5 volts. By executing instructions in a single clock cycle, the device achieves throughputs approaching 1 MIPS per MHz, balancing power consumption and processing speed.
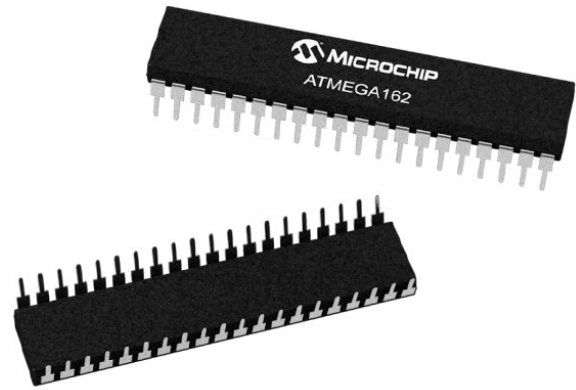

Figure 2. Atmega IC

2. LCD DISPLAY

A liquid-crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images (a sin a general-purpose computer display) or fixed images which can be displayed or hidden. Such as preset words, digits, and 7-segment displays a sin digital clock. The same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements. The LCD displays information about the steps that should be followed by the user etc.


Figure 3. Liquid Crystal Display

3. Power Supply

The ac voltage, typically 220V rms, is connected to a transformer, which steps that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.

A regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes.
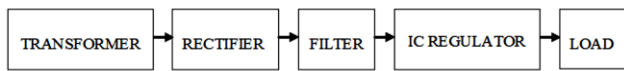
Figure 4. Block diagram (Power supply)

4. GPS

The use of GPS may appear at first complicated, but the principle is quite simple.GPS stands for Global Positioning System- a shorter term for NAVSTAR GPS(Navigation Satellite Timing and Ranging)-a system for locating ourselves on earth. It is a satellite-based system created and controlled by the US Department of Defense, initially for military purposes but extended later for civilian usage. It consists of a constellation of 24 satellites (4 satellites in 6 orbital planes) orbiting at an approximate altitude of 20200km every 12 hours. Each satellite broadcasts two carrier waves in L-Band (used for radio) that travel to earth at the speed of light.

Figure 5. Global Positioning System

5. GSM

A GSM modem exposes an interface that allows applications such as SMS to send and receive messages over the modem interface. The mobile operator charges for this message sending and receiving as if it was performed directly on a mobile phone. To perform these tasks, a GSM modem must support an "extended AT command set" for sending/receiving SMS messages, as defined in the ETSI GSM 07.05 and and 3GPP TS 27.005 specifications.

Figure 6. GSM Module

6. Motor

An electric motor is an electromechanical device that converts electrical energy to mechanical energy.

- An electric current in a magnetic field will experience a force.
- If the current carrying wire is bent into a loop, then the two sides of the loop, which are at right angle to the magnetic field, will experience forces in opposite directions.
- Practical motors have several loops on an armature to provide a more uniform torque and the magnetic field is produced by electromagnet arrangement called the field coils.
- Hence the motor speed will be decreased partially and the boat will takes a reverse action.

III. FUTURE SCOPE

- By replacing the GSM with some other means of communication like satellite communication which would be more efficient.
- Can be extended to provide full aid by identifying the density of fish in an area.
- In the ice dense cold areas it can be used to identify the ice bergs in oceans.
- Marine traffic can be completely controlled and bought under control.
- We can use the EEPROM to store the previous Navigating Positions up to 256 locations.
- We can reduce the size of the kit by using GPS+GSM on the same module of GPS navigator.
- We can increase the accuracy up to 3m by increasing the cost of the GPS receivers

IV.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 neighboring countries. Also, the piracy of ship can be easily brought under control.

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