Navigation Alert System for Fisherman Using Lab-View

Bhp.Vivek Varma, Mayank Balodhi, Pilly Prashanth ,Shaik Shafi

***Abstract*— Due to the lack in knowledge of maritime boundary line, most of the fishermen facing problem and being arrested by the costal officers. The aim moto behind this work is to provide a user friendly and well understandable environment to avoid accidents and to alert the fishermen about the border areas. Finally the above process is implemented using an Arduino controller, GPS connectivity and Lab view**

***Index Terms*— Arduino, GPS, Zigbee, NI Labview**

I. INTRODUCTION

Frequent incidents of fisherman getting shot in the maritime boundary have enraged everyone in the globe. This problem has been overcome to design the Ship Monitoring and Controlling by using GPS. The application permits finding and sending alert to the fisherman. The main aim of the project is to help the fishermen not to navigate beyond country's border. Keeping in mind about lives of fishermen, this project has been created to help them not to move beyond border. It is an attempt to build a suitable project to avoid frequent death of the fisherman and the conflicts between the countries.

II. LITERATURE SURVEY

At present, there are few existing systems which help to identify the current position of the boats/ships using GPS system and view them in an electronic map. GPS provides the fastest and most accurate method for mariners to navigate, measures speed, and determine the location. This enables to increase the levels of safety and efficiency for mariners through worldwide. The accurate position, speed and heading are needed to ensure that the vessel reach its destination safely. The accurate position information becomes even more critical as the vessel departs from or arrives in port. So our project is designed to avoid such kind of accidents and to alert the fisherman about the border areas, this is done using GPS connectivity and wireless communication

III. PROPOSED SYSTEM

Existing techniques cannot be used effectively because; this is available in large ship only also, they will be having the license. So, they didn't have problem for crossing the border. The proposed system, mainly for fishermen are used to detect the maritime boundary between the two countries. This mainly happens when fisherman crosses maritime border of neighboring country as he is not aware of the limits in sea. The proposed system uses a GPS concept to receive signals from the satellite and gives the current position of the boat. The latitude and longitude of the maritime boundary. To calculates the current position, stored boundary positions and indicates the fisherman that he has crossed the boundary by an alarm, vibrate& notification. The alert will be send to the server section and the fisherman will get the alert visually. This will be more user friendly for the fisherman near the border areas.

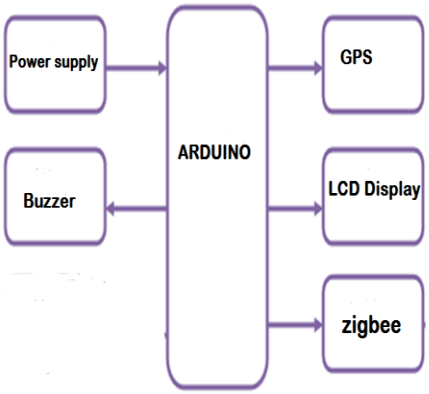

Fig. 1. Proposed system for fisherman

IV. WORKING PRINCIPLE

GPS (Global Positioning System) can be used to finding the position. In this paper is used to monitoring the position of the vessel by the help of GPS (Global Positioning System) then sending and displaying the information about the position of the vessel of fisherman. This paper is only for monitoring and displaying but not used to controlling the vessel.

V. GPS

The Global Positioning System (GPS) is a satellite based navigation system that sends and receives radio signals. A GPS receiver acquires these signals and provides the user with information. Using GPS technology, one can determine location, velocity and time, 24 hours a day, in any weather conditions anywhere in the world for free. GPS was formally known as the NAVSTAR (Navigation Satellite Timing and Ranging). Global Positioning System was originally developed for military. Because of its popular navigation capabilities and because GPS technology can be accessed using small, inexpensive equipment, the government made the

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Bhp.Vivek Varma, Student, ECE, B.V.Raju institute of technology, Medak, India

Mayank Balodhi, Student, ECE, B.V.Raju institute of technology, Medak, India

Pilly Prashanth, Student, ECE, B.V.Raju institute of technology, Medak, India

Shaik Shafi, Faculty, ECE, B.V.Raju institute of technology, medak, India

system available for civilian use. The USA owns GPS technology and the Department of Defense maintain.

A. *GPS Accuracy*

The accuracy of GPS depends on a number of factors, number of channels on the receiver, number of satellites in view, and signal interference caused by buildings, mountains and ionosphere disturbances. Accuracy should be within 15 meters (without SA) provided the receiver has a clear shot at a minimum of four satellites.

There are several methods that can improve GPS accuracy. Two commonly discussed are Differential GPS (DGPS) and Wide Area Augmentations System (WAAS). These improve accuracy to within 1 to 3 meters. DGPS uses fixed, mounted GPS receivers to calculate the difference between their actual known position and the calculated GPS position. This difference is then broadcast over a local FM signal. GPS units within range of the local FM signal can improve their position accuracy to within 1cm over short distances (but more typically 3-5 meters).WAAS, developed and deployed by the FAA, takes this approach a step further. Today there are 25 WAAS ground stations networked together. These communicate errors back to the wide area master station. The master station applies correction algorithms to the original GPS data stream and sends a correction message to a geosynchronous satellite. This satellite then transmits on the same signal as GPS satellites. This correction results in better than a 3 meter degree of accuracy.

B. *Calculating the positions*

Upon taking in all available satellite signals, the receiver compares the time that the satellite sent the signal to the time it was received for each of the available signals. Trilateralization (similar to triangulation) then calculates the position by comparing the difference among the signals.

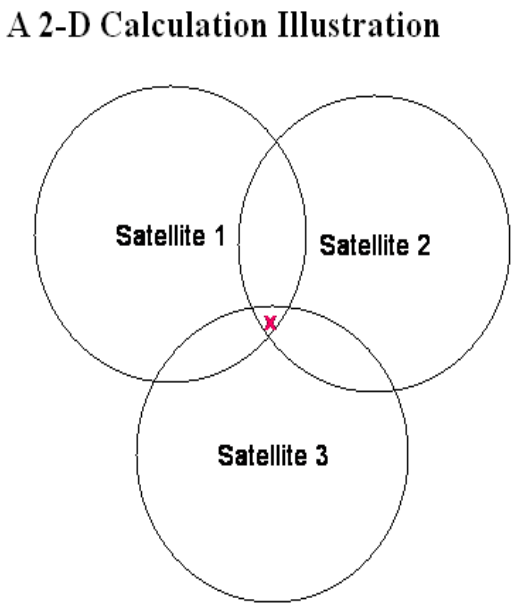

Fig.2. Calculating positions using GPS

VI. NI LabVIEW

We have taken NI Lab View back panel from this we can communicate with arduino. In this we are using VISA (virtual instrumentation software architecture) tool box for serial communication with zigbee transreciever. VISA serial tool box is used to connect to the zigbee which is Connected to com 6 we are creating a delay of 10000 milliseconds now we create a while loop for showing status whether he crossed border or not for that purpose we are using visa read tool box which can read maximum of 40 characters. It will receive longitude and latitude from zigbee which is placed on the board. this can be shown in status bar, if this loop fails the control will go to visa clear if there any error occurred during the transmission of data it will show error in status bar. We cannot show the output in real time so we created a demo button in this we created a if loop in this we marked coordinates. If this loop is true than it will show "BORDER CROSSED" and the buzzer will give alert. if loop fails it wont give alert. The images of the labview diagram and the demo coordinates we used can be shown in the below figures.

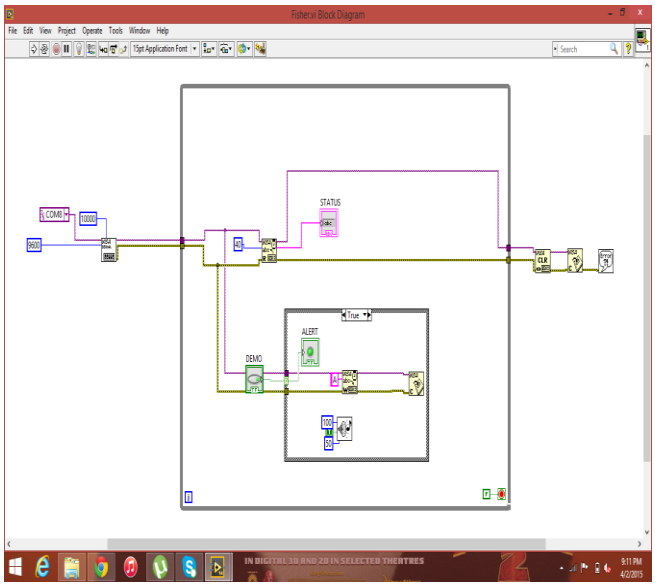

Fig.3. Serial Communication Using NI Lab view in server

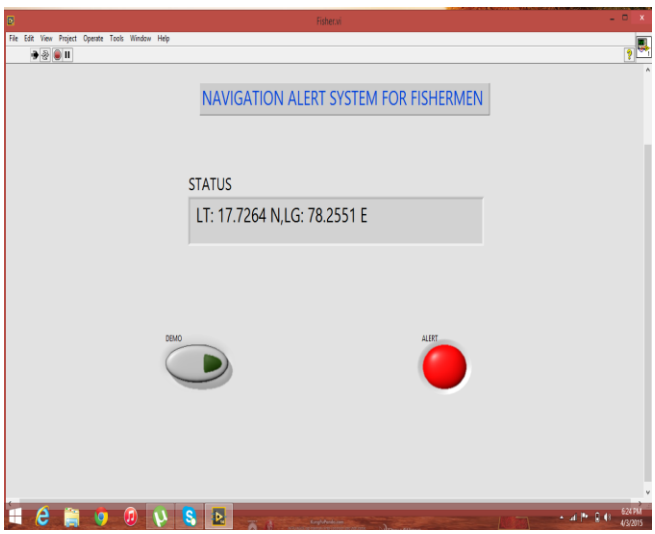

Fig .4.GPS coordinates of the location in output

It shows the output as the coordinates where it has both longitude and latitude.When connected with the external kit that is the hardware, also these coordinates are displayed on the LCD. These are the present locations. This will be connected with an usb-uart port connected to a zigbee which will be communicating with the moving hardware present at the ship of the fisherman which also has a zigbee.

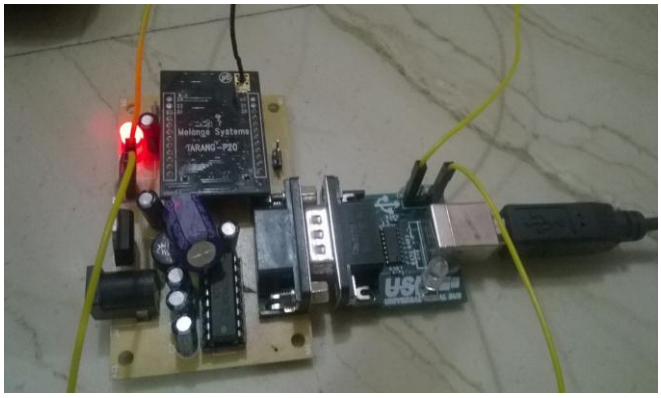

Fig.5.UART-USB Converter

As part of the project objective, the code is to be dumped in which the boundary is marked in the arduino so that it gives alert to fisherman when the bounadary is crossed. This is done with help of a microcontroller. Following figure shows how the controller will be at the center of the whole system. All the signals will be coming towards the controller and all the signals will be going out from the controller. Thus, the microcontroller will play a very important role in digitization of the sensor signals.

The processor is programmed to get the gps value information. Latitude and longitude value is send serially to the zigbee transceiver, from which zigbee information is obtained using wireless mode. Also the unirt consists of alarm which is controlled from control unit.

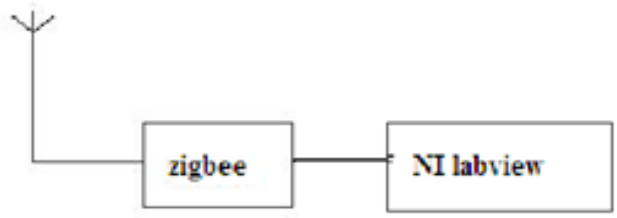

Fig.6. Control Section for ship

When we press the demo button the stored coordinates which are the boundary coordinates are matched with the coordinates of the location and if they are same it gives the alert and status as "BORDER CROSSED" shown below.

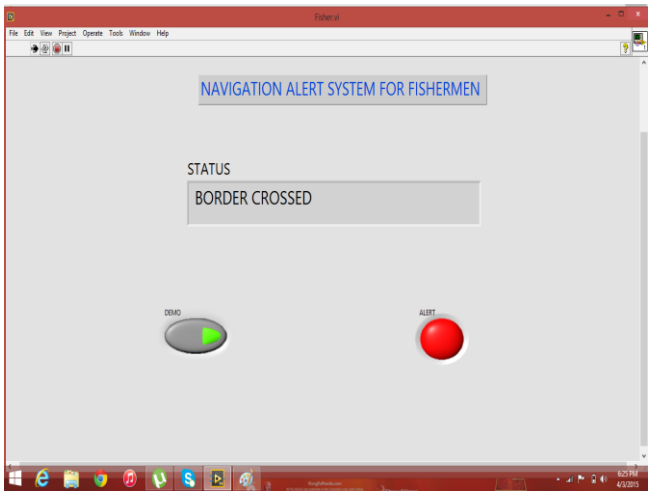

Fig.7. Output to show border crossed with a demo

VII. HARDWARE OUTPUT ON LCD DISPLAY

It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. A lcd display of 16 X 2 used for displaying latitude and longitude. Messages are sent through commands via serial communication. Figure shown below illustrates the present coordinates of the location and it is displayed and transmitted to the server section

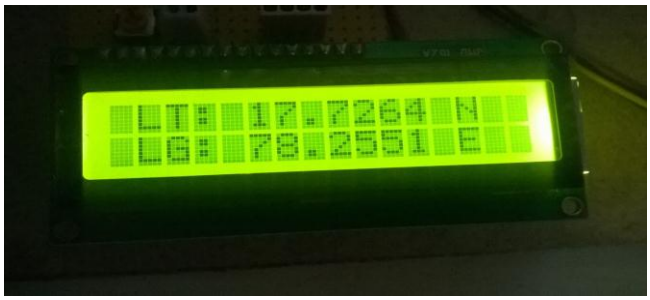

Fig.8. Display of co-ordinates

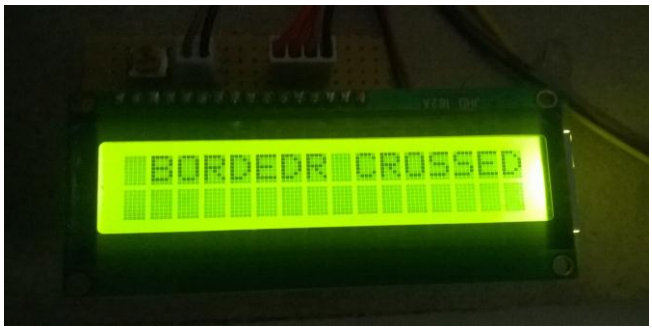

Fig.9. Alert system

The above figure gives the alert to fisherman by displaying "BORDER CROSSED" and the buzzer gets on to give a sound alert.

VIII. APPLICATION

1. Location of any lost vehicle could be found
2. Low cost and able to use in smaller boats.
3. It is a useful device for alert neighbors in sea for some medical emergencies.
4. Since many countries which are having long coastal area facing lots of problems regarding the maritime boundary of the Country, this device is made to identify the maritime boundary and to provide assistance if needed.

IX. ADVANTAGES

1. The project induces the new methodology for saving the fisherman's valuable life and their Properties from the neighbor's navy.
2. Low cost and able to use in smaller boats.
3. It is a useful device for alert neighbors in sea for some medical emergencies.
4. Since Sri Lanka and India have got lots of problems regarding the maritime boundary of the Country, this device is made to identify the maritime boundary and to provide assistance if needed.

X. Conclusion

According to our concepts the every fisherman can be traced automatically by their self and also they can be safer and they can protect their selves from the foreign navy which leads to a pleasurable life for them. It is a useful device for safer navigation, especially for fishermen. Since Sri Lanka and India have got lots of problems regarding the maritime boundary of the country, this project is made to identify the maritime boundary and to provide assistance if needed. The main advantage of this paper is compact and low cost.

XI. Future Scope

It is concluded that the works well and satisfy the users. The application is tested very well and errors are properly debugged. Further enhancements can be made to the application of Find-A-Friend, this application fisherman can find their limits in border their self without any-one help and they can send emergency alert to nearby fishers.

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Authors:

Bhp.vivek varma: Final year Student, ECE, B.V.Raju Institute of Technology, Narsapur (V), Hyderabad, Telangana, India. Interested areas are Embedded systems.

Mayank balodhi: Final year Student, ECE, B.V.Raju Institute of Technology, Narsapur (V), Hyderabad, Telangana, India. Interested areas are Embedded systems and communications.

Pilly prashanth: Final year Student, ECE, B.V.Raju Institute of Technology, Narsapur (V), Hyderabad, Telangana, India. Interested areas are Embedded systems and Integrated circuits

Shaik Shafi, received Bachelor of Technology and Master of Technology degrees in Electronics and Communication Engineering from Jawaharlal Nehru Technology University, Hyderabad in 2007 and 2011, respectively. He has total 6 years of teaching experience and presently working in B.V.Raju Institute of Technology, Narsapur (V), Hyderabad, and Telangana, India..