ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 4, Special Issue 7, March 2017

SHIP NAVIGATION SYSTEM

P.DIVYA DARSHNI, S.INDHU, S.RAMYA

SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY

15bb510@skcet.ac.in, 15bb516@skcet.ac.in, 15bb527@skcet.ac.in,

ABSTRACT:

The life of fishermen has become very critical in crossing the limitation of borders. This was a problem faced by our state for many years. Though we tried to do our level best, in most of the time we fail to save their lives. At, present there are few existing systems which help to identify the current position of the boats and ships using GPS and view them in an electronic map.Zigbee, FPGA,LED display, RF Transmitter, RF Receiver, Decoder, Encoder, Battery power are the main components. The FPGA hardware and Xilinx software can be used. Zigbee plays a most important role because the limit of the border is specified already in the device. Since sea covers a large area, so Zigbee is very much needed.Zigbee devices transmit data over long distances by passing data through intermediate devices. RF Transmitter transmits the message from sea port to boat section where the fishermen can receive it. The signals or messages can be encoded by the encoder in sea port. The signals or messages received by fishermen must be decoded by decoders who are in boat section. In LED Display a message will be displayed to the fishermen so that they can change their direction. Battery power is used for every components or devices. Before 1000 meters of countries border, an alarm is indicating that the fishermen are nearing the border because of this Alarm; the fisherman can be cautious and come back inside the country's border.Thus, the aim of this paper is how to save the life of the fishermen's by using wireless technologies by giving alertness to them who are in ship. The ultimate objective of this paper is to help the fishermen not to navigate beyond the other country's border.Zigbee is the only standards based wireless technology designed to address the unique needs of low-cost, low-power wireless sensor and control networks in just about any market. Since Zigbee can be used almost anywhere, it is easy to implement and needs little power to operate. With hundreds of members around the globe, Zigbee uses 2.4 GHz radio frequency to deliver a variety of reliable and easy-to-use standards anywhere in the world.

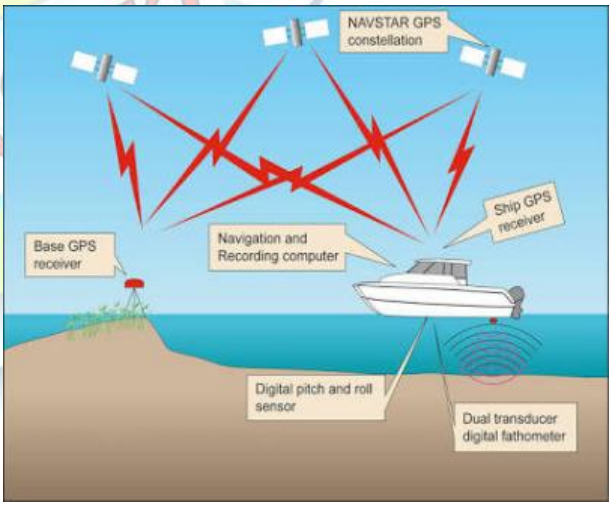
ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 4, Special Issue 7, March 2017

SHIP NAVIGATION SYSTEM:

The Tamil Nadu factor in Indian-Sri Lanka relations that has been quiet for so long has come to the force in the form of fishermen issue. A frequent incident of fishermen from Tamil Nadu getting shot in the Sri Lankan's Maritime boundary has enraged all citizen of the state. From Tamil Nadu about 18,000 boats of different kinds conduct fishing along the India-Sri Lanka maritime border. Ever since violence broke out in Sri Lanka two decades ago; fishing activity has not been peaceful. Tamil Nadu fishermen are arrested, or shot, by the Sri Lankan navy. The drift is because of engine failure or strong currents.

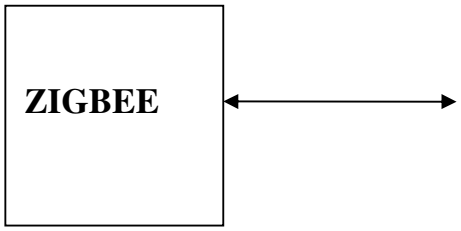
The peninsula, island and the coastal countries had their boundary limit in the sea, the people's lives in those type of country has the work of fishing in the sea due to carelessness or without knowing their boundary limit of their country they crossing the borders. In such a situation the lives of fishermen continue to be difficult. If they face bullets from the enemy navy lot they were killed, now they are at the receiving end of attacks by opposite navy. They are being abducted and their boats are being captured. Nowadays people living in coastal areas are loss their life unknowingly. Those peoples shot death by their neighbourhoods militants, saying that they crossing the borders. So this paper is designed to avoid such kind of accidents and to alert the fisherman about the border areas.

Global positioning system (GPS) is increasingly being used for a wide range of applications. it provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the earth.GPS is made up of three segments :space, control and user.GPS has become a widely used aid to navigation worldwide, and a useful tool for map-marking, land surveying, commerce, scientific uses, tracking and surveillance. None of the present GPS systems satisfy the requirements for the safety of civilian navigation in the sea as the maritime boundary of a country cannot be marked.



GPS system in ship navigation

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 4, Special Issue 7, March 2017



Zigbee

These paper ads on the versatility and the usefulness of a GPS device in the sea. The main objective of the paper is to help the fishermen not to navigate beyond other country's border. If a fisherman navigates beyond the country's Border, an alarm is generated indicating that the fisherman has nearing the border. With these alarms, the fisherman can be caution and come back inside the country's border. Additionally, a message transmitter is interfaced with the device to send a message to base station located on the shore indicating a vessel has crossed the border. These guards in the shore can assist and provide additional help to those fishermen if needed.

EXISTING SYSTEM:

At present, there are few existing systems which help to identify the current positions 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, measure speed and determine location. This enables increased level of safety and efficiency for mariner's worldwide and accurate position, speed and destination safety. The accurate position information becomes even more critical as the vessel departs from or arrives in port.

PROPOSED SYSTEM:

The proposed system is used to detect the maritime boundary of the country where the long time dispute between Sri Lanka and India still exists. this mainly happens when fisherman crosses the maritime borders of neighboring country as he is not aware of the limits in the sea .the proposed system uses a GPS receiver which receives signals from the satellite and gives the current position of the boat. With already known details of the latitude and longitude of the maritime boundary. The microcontroller calculates the current positions and stored boundary positions and indicates the fishermen that he has crossed the boundary by an alarm system. It also uses a Zigbee transmitter to send message to harbor which monitors the boats in the sea. Our system provides an indication to both fisherman and to coastal guard. Thus, the system saves the lives of the fisherman or reduces the damaged caused to them by Sri Lankan coastal guards.

When vessel crosses border, an alarm is generated immediately, along with an alarm a signal is also send to Zigbee module for transmission of message to desire a sender. Alarm continues until the vessel comes back inside the country's border.

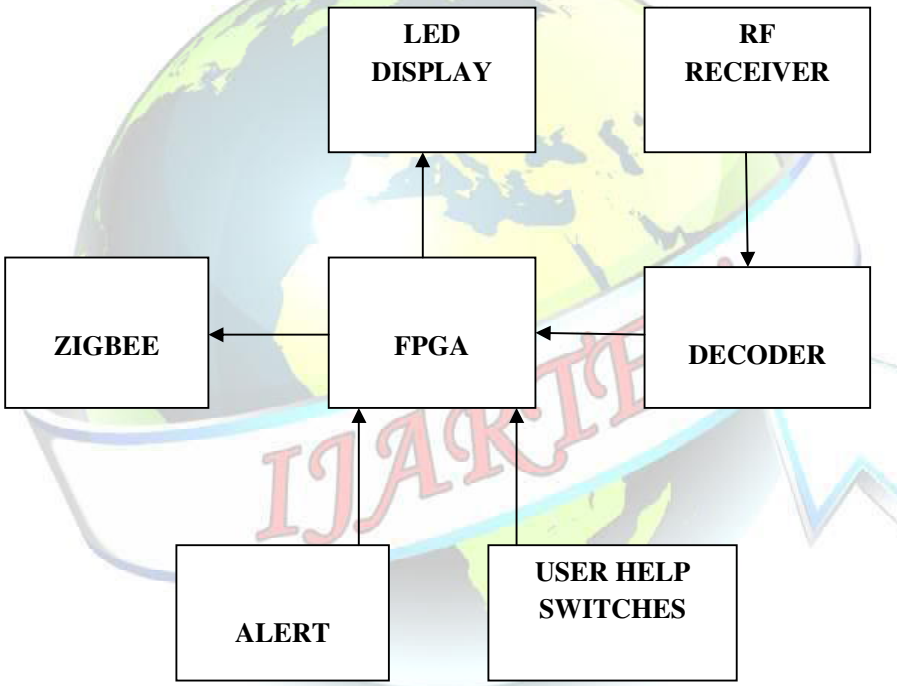
When the fisherman crosses the border, the information is transmitted using Zigbee .through the GPS the latitude

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 4, Special Issue 7, March 2017

and longitude values are noted and current position of the vessel is calculated as the border .once the border is crossed the motor automatically stops and buzzer gives alarm. The vibration sensor is used to detect the tsunami and also there is an IR sensor provides the information about any obstacles the coastal guard receive the information through the Zigbee receiver. The border crossing is indicated by an alarm and also it provides the LCD display of the vessel number.

alarm or the buzzer which provides the alertness to the fisherman.

The LED display will display the vessel number and it is a 7 segment display. It is a flat panel display electronic switch, Or video display that uses the light modulating properties of liquid crystal. Liquid crystal does not emit light directly. LCDs are available to display arbitary images which can be displayed or hidden, such as preset words, digits;



Sea section block diagram

The section consists of 6 hardware like the LED display, If receiver decoder, user help switches alert and Zigbee. The 7th hardware is the FPGA which act as the brain of ship navigation system. Without the hardware the system seems to be impossible. The alert is nothing but the

liquid crystal displays are a phase of matter whose order is intermediate between that of a liquid and crystal. The molecules are typically rod-shaped organic matters.LCD is made up of two sheets of polarizing material with the liquid crystal

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 4, Special Issue 7, March 2017

solution between them. An electric current passed through them which results in display of character as per the applied voltage in its data lines. A driver will be provided to drive the LCD. The color of the LCD may be green, yellow, and gray, blue...

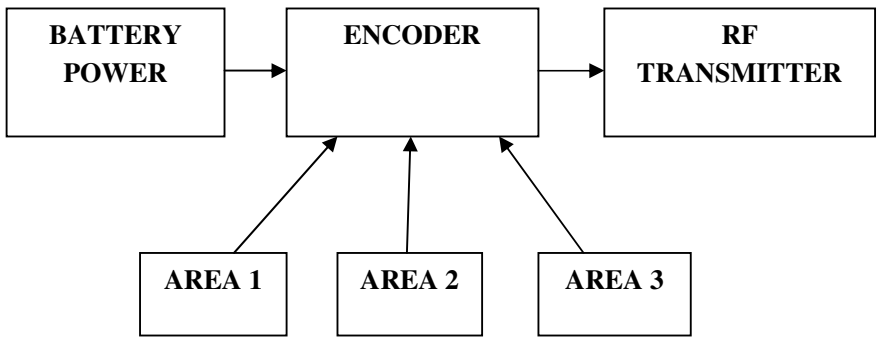
LCD displaying the characters

LCD displaying the numbers

Navy section block diagram

In the navy section there are three areas namely area1, area2, area3.RF transmitter, encoder, battery power are the other important hardware's used in the navy section.

RF transmitter will transmit the Signals. The encoder is a sequential device mostly the encoding will be done at the transmitter side and the decoding will be done at the receiver side. Antenna acts as a source to transmit and receive the signals. There is a compact sized antenna in the encoder and the decoder side. The antenna which is used in the decoder side is called as decoder antenna and the antenna which is present in the decoder is called decoder antenna. The antenna can also be called as a transceiver the encoder antenna is a transmitting antenna and the decoder is a wide spread antenna. If we give over voltage the antenna will be damaged. the battery power is a 5v battery which is a power source.



ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 4, Special Issue 7, March 2017

PROBLEM STATEMENT:

- Borderline measured manually.
- Difficult to communicate to navy control.
- Fuel level measured through the fishermen.
- Functions of this system based on time and distance

PROPOSED SYSTEM:

- Effective alert system for fishermen.
- Communication between fishermen boat and navy control is reliable.
- Wireless communication used for transmitting information.
- Display system for identifying boundary and also the weather conditions.

CONCLUSION

This paper aims to give solution to save the lives of the fishermen who are navigating beyond the border. This process is controlled by FPGA Controller, which produces outputs such as LED and buzzer indication to the fishermen who are about to cross the border and also to safeguard them. Since Zigbee is used for long distance communication between navy section and boat section the people who are monitoring will also get a display showing that fishermen are about to cross the border. Thereby the guard who is present in the control room can alert the people who are travelling in the boat.

This paper could be enhanced further by increasing the number of ships and distance coverage from boat to sea section.