Intelligent Boundary Alert System Using GPS

Jangid Prakash[1], S.S. Palnitkar[2], Bondage Nagesh[3], Biradar Pritam[4]
Department of E&TC, SKNCOE, SPPU, Pune

[1]*619prakashj@gmail.com*
[2]*smitpalnitkar@gmail.com*
[3]*nageshbondage04@gmail.com*
[4]*pritambiradar001@gmail.com*

Abstract - In day-to- day lifestyles we listen approximately many Tamil fishermen being stuck and placed Srilankan custody or even killed. The sea border among the international locations isn't without difficulty identifiable, that is the primary motive for this go border cruelty. In this paper, a machine the usage of embedded machine which protects the fishermen by the usage of Global Positioning System (GPS) and Global machine for communication (GSM). We use GPS receiver to discover the modern-day place of the fishing boat or vessel. Using GPS, we will discover the modern-day range and longitude values and is dispatched to the micro-controller unit. Then the controller unit need to find the current location by comparing the present latitude and longitudinal values with the predefined value. Then from the result of the comparison, this machine conscious the fishermen that they're approximately to attain the nautical border. The location is split into 4 zones- ordinary sector, caution sector, sector close to restrained sector and subsequently the restrained sector. If the LCD displays normal zone, then the boat is in normal area. The LCD displays warning zone, in case it moves further and reaches the warning zone, If the fisherman ignores the warning or fail to see the display and move further, and if the boat enters the zone nearer to the constrained zone the alarm will turn on and the speed of the boat engine robotically gets controlled by 50%. If the fisherman did not take any reaction about the alarm and move further, the alarm continues to beep as before, then the boat will enter the constrained zone, and once it touches the restricted zone, the boat engine gets off by the control of fuel supply to engine.
Keywords— Global Positioning System, Global system for mobile communication, Relay, Internet of Things

I. INTRODUCTION

GPS un-remarkably referred to as international Positioning System additionally referred to as Nav star GPS that has Geo location and therefore the data to a GPS receiver all told, atmospheric condition, anyplace on or close to the planet wherever there's Associate in Nursing unclogged line of sight to four or additional GPS satellites. GPS systems are a unit very versatile and might be found in nearly any business sector. They will be wanting to map forests, facilitate farmers harvest their fields, and navigate airplanes at the bottom or within the air GPS systems are a unit utilized in military applications and by emergency crews to find individuals in would like of help. Therefore, with a large form of its usage the GPS technology to unravel the issues sweet-faced by the fishermen. Thus, a GPS modeled device has been created through that fisherman is prevented from crossing the border by keeping a continuing eye on the movement of ships within the ocean. GPS and Wi-Fi module are incorporated with the ships. GPS modules facilitate USA to sight the latitude and line of longitude of the actual place and as before long as these ships reach a selected location, i.e., close to the border the GPS can find it and a buzzer is plumbed and a red lightweight can glow that may alert the fishermen and that they might simply come back from the border. The motivation for this paper was primarily the $64000 drawback of fishermen UN agency visited earn their bread and butter within the ocean and accidentally cross the borders and face legal issues from the opposite countries. This encouraged the USA to basically see a clever

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response to the current downside of the anglers, so they do not face any drawback whereas fishing within the ocean or seas. According to the anglers' perspective, because of sheer obliviousness about sea limits, wandering happens incidentally.   Now and again, the float is a direct result of motor disappointment, a few Indian fishermen engage in free floating to exploit marine resources in Sri-Lankan. The Indian Coast Guard not withstanding having an enormous armada available to it has not had the option to recognize unfamiliar gate crashers now and again. The Indian Coastguard has openly admitted its failure in preventing 26/11 Mumbai attack even after getting a warning from intelligence sources prior to the attack. Our sea defense is weaker than we believe here it indicates. Infrequently the anglers sight an unfamiliar fishing boat poaching in their fishing grounds, they are compelled to observe weakly in dread that they may be harmed or killed. The fishing boat would regularly leave unafraid of punishment. Poaching is getting a difficult issue since this would cause ecological emergency in beach front zones. The system that we propose not only prevents the fisherman from crossing the International Maritime Limit Line yet in addition empowers the anglers to answer to the Coast Guard on recognizing an intruder. This increases the overall security of coastline and reduces the necessity for periodic patrolling of sea by the coast guard.

II.   LITERATURE SURVEY

D. Jim Isaac et al [1] the paper titled as "Advanced border alert system mistreatment GPS and with intelligent Engine management unit, "In the system mistreatment GPS and GSM, wherever GPS is employed to seek out the placement of the boat. If the boat nearer to the boundary primarily it is warning the fishermen with the alarm and emits the placement of the boat to the closest coast workplace via GSM communication. Once it additional nears the maritime boundary associate degree interferes is shipped to the Engine management Unit that controls the speed of the engine with the assistance of the electronic fuel device and its low value maritime. By this methodology, we can alert the fishermen and conjointly monitor them, thereby avoiding illegal activities like importation, intruders, etc. S. Kiruthika et al [2] the paper titled as" A Wireless mode of protected defense to mariners mistreatment GSM technology "In that framework abuse exclusively GPS to get the information from the satellite and hang on the boundary areas to locate if the boat has crossed the line." If, therefore the seafarer is alerted and therefore the message is transmitted to close the coast workplace through RF signals at VHF (30-300MHz) vary that covers wide space. Naveen Kumar [3] the paper titled as" border alert associate degree sensible chase system with alarm uses DGPS and GSM and this technique uses DGPS to trace the placement of the boat and to activate an alarm that consists of a Piezo-buzzer, once the border is moving toward or crossed. Also, additionally, the DGPS info is shipped to manage workplace, and conjointly the knowledge is shipped to the family at regular time intervals that square measure in expectation concerning their family member's safety.

III.   PROPOSED SYSTEM

In this proposed system, the main modules are GPS and Wi-Fi sensor in additional with the temperature sensor. The information of current latitude and longitude is recognized to both fishermen and coastal guards. The border is known by comparing the current values with the original values and the message is sent through Wi-Fi sensor using IOT. For this single antenna is used. Instantly the information is updated continuously. The low earth orbit is used to provide the connectivity without gaps. This likewise helps in recovering the missed messages. By using the electronic map, the navigation path can be known. Thus, it saves the lives of the fisherman and alerts the base station to provide help.
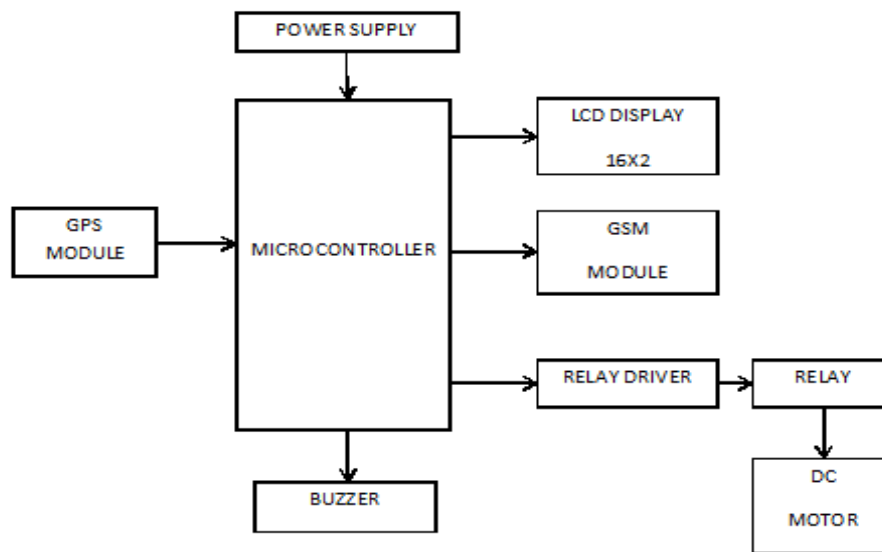
Fig. 1 The proposed system block diagram

The GPS receiver is connected to the microcontroller through UART. The data are sent to UART and then to the microcontroller. Computational works are done in the microcontroller and the signals are sent to the LCD display, buzzer and GSM module. Message form controller to GSM module is sent through UART.

The type of receiver determines with GPS the accuracy of a position. Most hand-held GPS units have about 10–20-meter accuracy. To obtain much higher accuracy other types of receivers use a method called Differential GPS (DGPS). DGPS requires an extra beneficiary receiver fixed at a known area nearby. The roving units recorded the observation made by stationary receiver to correct the position, producing an accuracy greater than 1 meter. At the point when the framework was made, timing blunders were embedded into GPS transmissions to restrict the exactness of nonmilitary GPS recipients to around 100 meters. This part of GPS operations, called Selective Availability, was eliminated in May 2000.

The Control Unit UART is an abbreviation of Universal Asynchronous Receiver and Transmitter. The MAX232 is a double driver/recipient that incorporates a capacitive voltage generator to supply TIA/EIA-232-F voltage levels from a solitary 5-V inventory. For generating 5-V TTL/CMOS levels each receiver converts TIA/EIA-232-F inputs. GPS and GSM work in CMOS levels. In this way, max 232 aides in synchronizing GPS and GSM modules with the microcontroller which works in TTL level. Microcontroller (89S52) gets the information from the GPS beneficiary through UART. information got contains numerous subtleties alongside scope and longitude. The latitude and Longitude of the current position are separated from the detailed data from GPS. The current positions were compared with already stored latitude and longitude of country boundary locations. The latitude is compared with stored latitude which identifies if the current position is located near to the boundary. If the latitude matches, then the adjacent latitudes and longitudes of the present latitude is retrieved from the microcontroller. Later, using an algorithm, the position of the vessel with respect to boundary is found. The current position received from a GPS is stored at S1 (latitude), S2(longitude). The latitude S1 is compared with stored latitudes. If latitudes match, then adjacent latitudes and longitudes (X1, Y1 and X2, Y2) are retrieved from stored table and substituted in the equation given below $(Y-Y1)/(Y2-Y1)$

=(X-X1)/(X2-X1) By simplification, we get aX + bY = c Now, S1 and S2 are substituted in above equation of line.
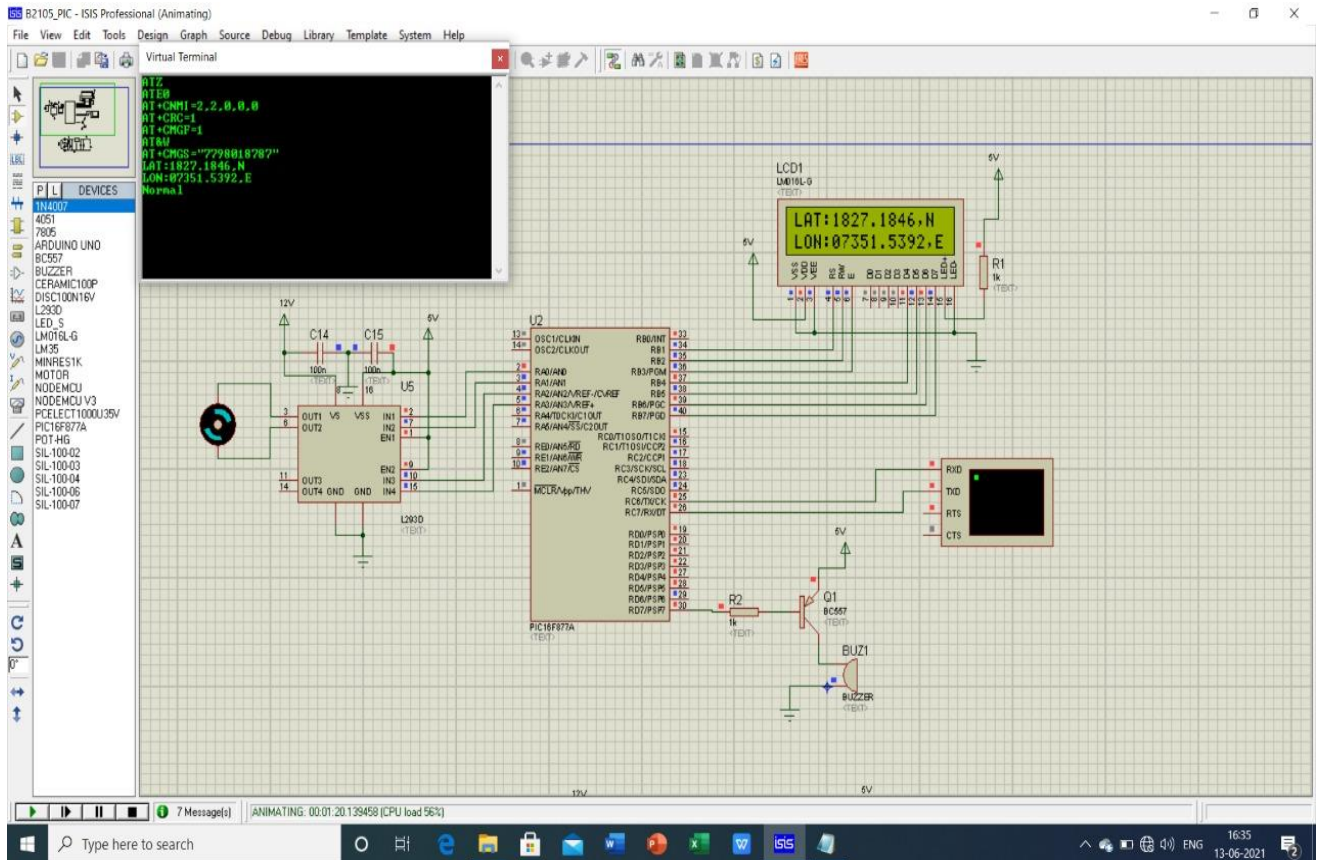
IV.   RESULT

Fig. 2 normal conditions latitude and longitude values

In the above figure, we get latitude and longitude values under normal conditions.
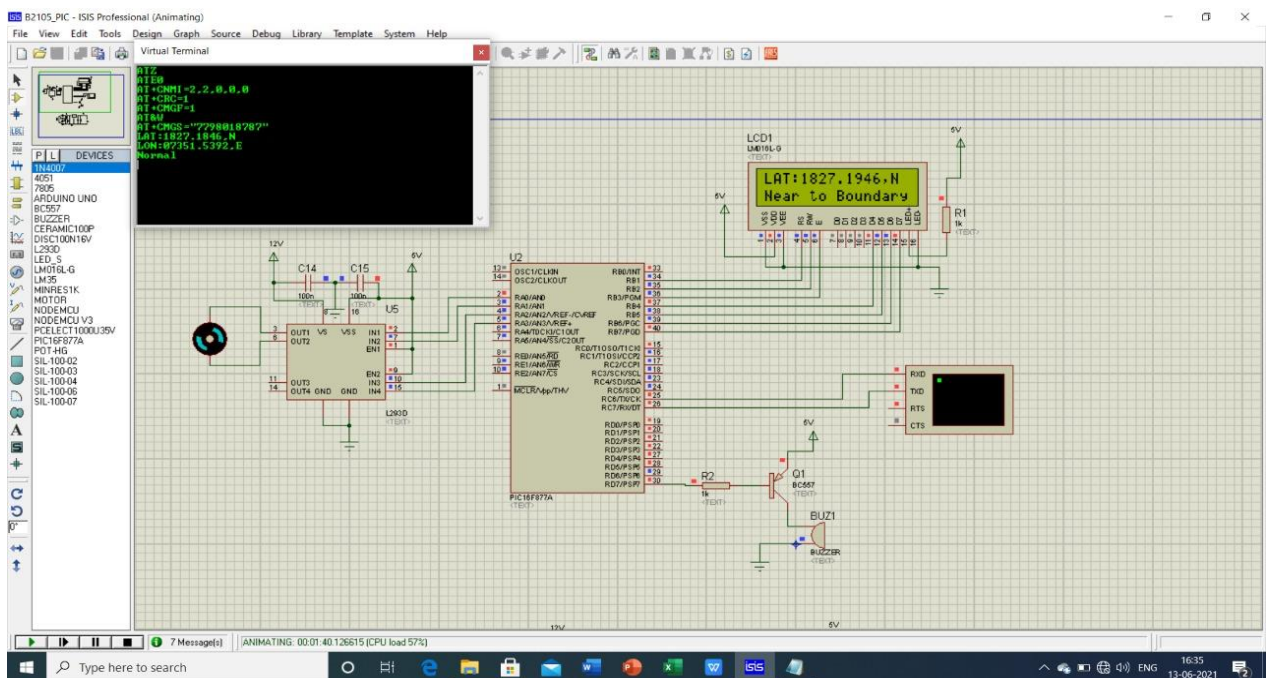
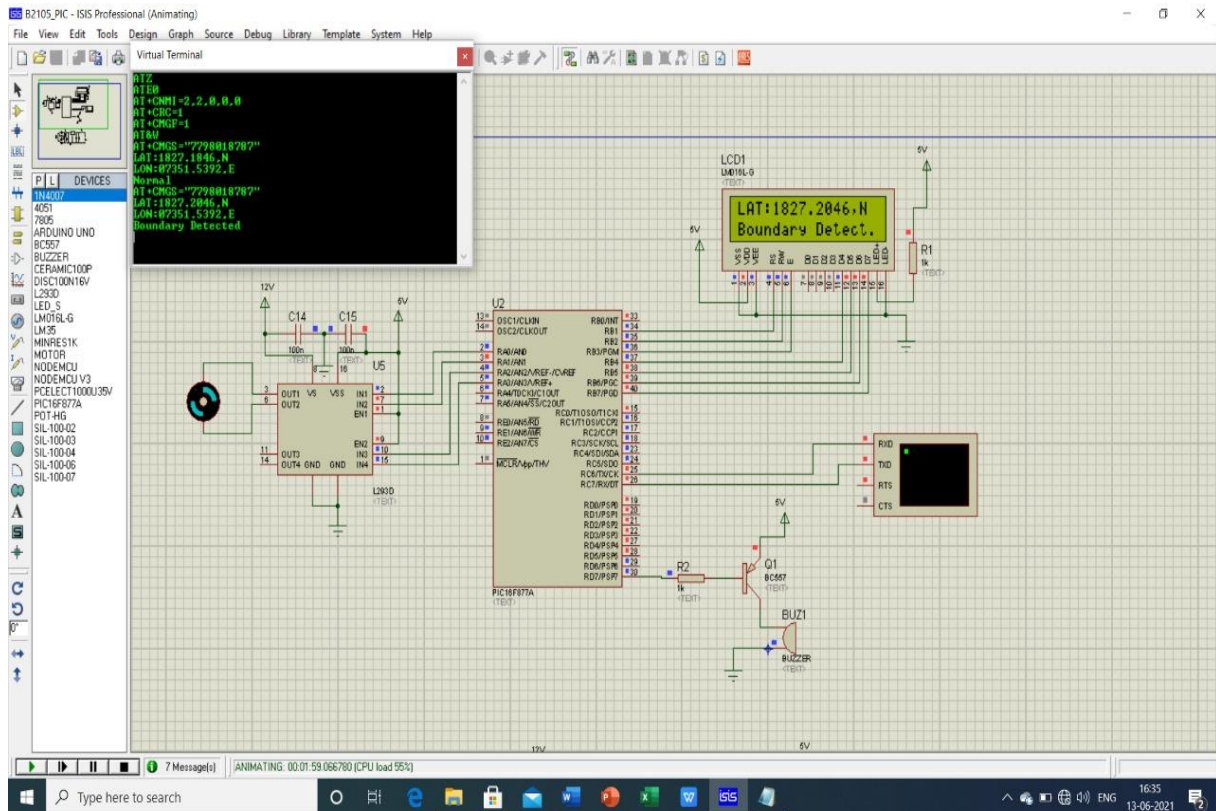Fig. 3 latitude and longitude value when boat is near to the boundary.

Fig. 4 Latitude and longitude value when boundary is Detected

V. CONCLUSION

In the typical, the fishermen must be compelled to keep watching the maritime border, that cannot be simply separated as land region. If they crossed sure limit on the ocean. They need to pay the penalty or got inactive by the military service guards of the neighbor country. The project generates alarm if they cross the border by mistake. With the straightforward electronic equipment and the use of sensors (low value sensors) makes the project a coffee value product, which might be purchased even by a poorly trained worker. This project is best suited to places wherever the fishermen endlessly monitor the boundary limit. In the recent times the capture of Indian fishermen across the state border has been exaggerated. It's tough for the fishermen to get the borders and lost into different country' borders. Our objective is to present wireless support to those fishermen and except for to travel out when them if they're found missing. This project may be a low value economical methodology of wireless trailing. It additionally offers ample info to each ship and coastal guardians of anyone crossing the border.

REFERENCES

[1] Jim Isaac, the paper titled as Advanced border alert system using GPS and with intelligent Engine control unit International Journal of Electrical and Computing Engineering (IJECE) Vol. 1, Issue. 4, June 2015.

[2] S.Kiruthika and N.Rajasekaran "Implementation Of GPS Based Surveillance Navigation System For Fisherman" International Journal of Scientific Research and Engineering Studies (IJSRES) Volume 1 Issue 5, November 2014 ISSN: 2349-8862.

[3] NaveenKumar.M Ranjith.R The paper titled as Border alert and smart tracking system with alarm using DGPS and GSM International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) ISSN: 0976-1353 Volume 8 Issue 1 APRIL 2014.

[4] A. Yogesh Kumar, A. Bharani Vasan, and S.P. Valan Arasu, "GPS based tracking of maritime line of control monitoring system," Int. J. Curr. Sci., vol. 14, pp. 12-18, 2015.

[5] D. D. Vishwakarma," IEEE 802.15.4 and ZigBee: A Conceptual Study," Int. J. Adv. Res. Comp. Comm. Engg., vol. 1, pp. 477-480, September 2012.

[6] F. Yi-yuan, and C. Xue-jun," Design and Simulation of UART Serial Communication Module Based on VHDL," in Proc. of 3rd Int. workshop on Intelligent systems and applications, Wuhan, China, May 28-29, 2011.

[7] S. A. Weis, "RFID (Radio Frequency Identification): Principles and Applications," System, vol. 2, pp. 1-23, 2007.

[8] H. Durani, N. Bhatt, and H. Mehta, "RFID and GPS combination approach implementation in fisher boat tracking system," Int. J. Comp. Sci. Info. Tech., vol. 5, pp. 1836-1838, 2014.

[9] Reisman, W.M., and G.S. Westerman, "Straight baselines in maritime boundary delimitation", 1992, New York: St. Martin's Press. xvi, pp. 242.

[10] S. Mani Sunder, "Deep sea fishermen patrol system for coastal intruder positioning" Scientific Engineering and Technology (ISSN : 1581)Volume 2 Issue 3, PP : 129.

[11] R. Karthikeyan, A. Dhandapani, and U. Mahalingham, "Protecting of fishermen on Indian maritime boundaries," J. of Comp. Appl., vol. 5, pp. 228- 235, February 2012.