Alert System for Fisherman Crossing Border using Lab View

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***Abstract*—**The aim of the project is helpful for fisherman to crossing the border. In day-to-day life we hear about many Tamil Nadu fishermen being caught and put under Sri Lanka security forces custody and even killed. The sea border between the countries is not easily identifiable, which is the main reason for this cross border cruelty. We use GPS receiver to find the current location of the fishing boat or vessel. Using GPS, we can find the current latitude and longitude values and is sent to the microcontroller unit. Then the controller unit finds the current location by comparing the present latitude and longitudinal values with the predefined value. Then from the result of the comparison, this system aware the fishermen that they are about to reach the nautical border. And at the same time we introduce a audio announcement for alerting them, which is nothing but the device will communicate in their local language whenever they are crossing their border which could be easily understood by the fisherman. When any damage or sinking of boat causes, the fishermen can easily alert the guards near to them. When the Emergency button is pressed, an GSM signal carrying the latitude and longitude information will be send to the sea shore and it is possible to locate them easily where they are.

***Keywords*—**Alert System; Fisherman Border; GPS; Lab View; Microcontroller Unit.

***Abbreviations*—**Data Circuit-terminating Equipment or Data Communication Equipment (DCE); Data Terminal Equipment (DTE); European Telecommunications Standards Institute (ETSI); Global System for Mobile Communication (GSM); Global Positioning System (GPS).

I. INTRODUCTION

ESPECIALLY, In Tamil Nadu nearly 20,000 boats perform fishing in the Bay of Bengal. Due to carelessness or unknowing the boundary limit, the fisherman used to rude the maritime borders. Once they rude the border, they 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. It is a major threatening issue and leads to loss in the both humans as well as their economic incomes. 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). The technology proliferation will be an apt choice for resolving the nautical boundary crossing [Arunvijay & Yuvaraj, 1].

II. BLOCK DIAGRAM

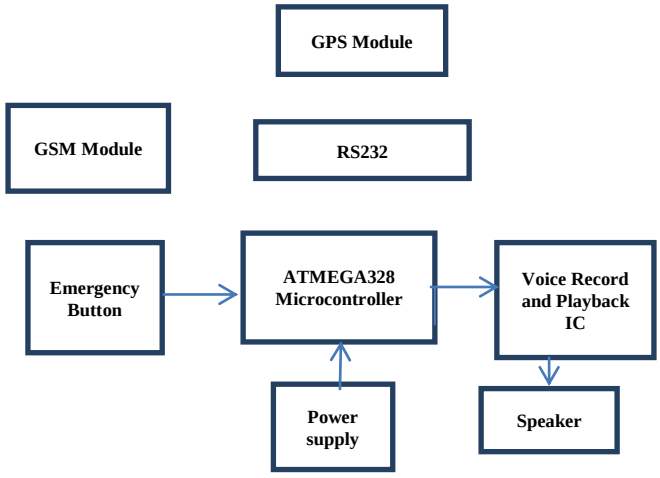

Figure 1: Block Diagram

2.1. GSM – SIM 900

Figure 2: GSM – SIM 900

GSM (Global System for Mobile Communications) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation (2G) digital cellular networks used by mobile phones. GSM networks operate in a number of different carrier frequency ranges with most 2G GSM networks operating in the 900 MHz or 1800 MHz bands. The transmission power in the handset is limited to a maximum of 2 watts in GSM 850/900 and 1 watt in GSM 1800/1900.GSM-SIM 900 is a GSM/GPRS-compatible Quad-band cell phone, which works on a frequency of 850/900/1800/1900MHz and which can be used not only to access the Internet, but also used for speech communication and for SMSs. Externally, it looks like a big package (0.94 inches x 0.94 inches x 0.12 inches) with L-shaped contacts on four sides so that they can be soldered both on the side and at the bottom. Internally, the module is managed by an AMR926EJ-S processor, which controls phone communication, data communication (through an integrated TCP/IP stack), and (through an UART and a TTL serial interface) the communication with the circuit interfaced with the cell phone itself [Sivaramaganesh et al., 2].

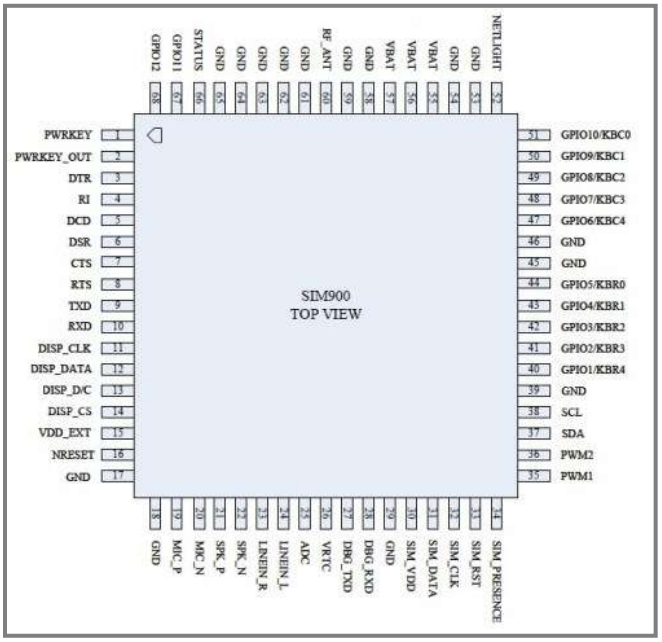

Figure 3: SIM 900 – Top View

2.2. GPS L80

Figure 4: GPS L80

The Global Positioning System (GPS) is a space-based radio navigation system owned by the United States government and operated by the United States Air Force. It is a global navigation satellite system that provides geo location and time information to a GPS receiver anywhere on or near the Earth. The GPS system provides critical positioning capabilities to military, civil, and commercial users around the world. Adopted by LCC package and integrated with patch antenna, GPS L80 has exceptional performance both in acquisition and tracking. With its tiny design, high precision and sensitivity, L80 is perfectly suitable for a broad range of M2M applications such as portable device, automotive, personal tracking, security and industrial PDA. With 66 search channels and 22 simultaneous tracking channels, it acquires and tracks satellites in the shortest time even at indoor signal level [Mani Sundar & Hariharan, 3].

2.3. ATMEGA328

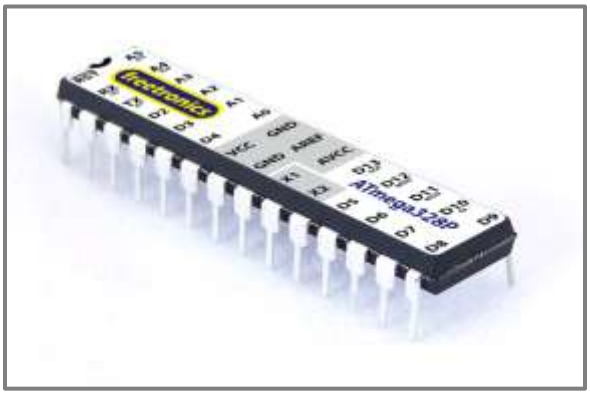

Figure 5: ATmega328

The ATmega328 is a single-chip microcontroller created by Atmel in the mega AVR family.ATmega328/P is a low-power CMOS 8-bitmicrocontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328achieves throughputs close to 1MIPS per MHZ. This empowers system designer to optimize the device for power consumption versus processing speed. It combines 32 kb ISP flash memory with read-while-write capabilities and consists of 1 kb EEPROM, 2 kb SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages),

programmable watchdog timer with internal oscillator, and five software selectable power saving modes [Suresh Kumar, 4].

2.4. RS 232

RS-232 is a standard communication protocol for linking computer and its peripheral devices to allow serial data exchange [Sharath Jagannanthan & Maheswarai Rajavel, 5].

Figure 6: RS-232

It formally defines the signals connecting between a DTE (data terminal equipment) such as a computer terminal, and a DCE (data circuit-terminating equipment or data communication equipment), such as a modem. RS232 is a fine example of Full Duplex communications. There are separate transmit and receive signal lines that allow data to flow in both directions simultaneously.

2.5. Voice Record and Playback Module-APR33A3

Figure 7: Voice Record and Playback Module-APR33A3

Today's consumers want crystal-clear sound wherever they are in whatever format they want to use. The APR33A series are powerful audio processor along with high performance audio Analog-to-digital converters (ADCs) and digital-to-Analog converters (DACs).The APR33A series incorporates all the functionality required to perform demanding audio/voice applications. High quality audio/voice systems with lower bill-of-material costs can be implemented with the APR33A series because of its integrated Analog data converters and full suite of quality-enhancing features such as sample-rate convertor. The Operating Voltage Range is 3V ~ 6.5V and it is a Single Chip, High Quality Audio/Voice Recording & Playback Solution with no External ICs Required.

2.6. Arduino Genuino

Arduino is an open-source project that created microcontroller-based kits for building digital devices and interactive objects that can sense and control physical devices. The project is based on microcontroller board designs, produced by several vendors, using various microcontrollers. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board. The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. The Arduino language" is C++ or C.

III. *SOFTWARE TOOLS*

3.1. Labview

LABVIEW (short for laboratory virtual instrumentation Engineering work bench). Is a system design platform and development environment for a visual programming language from national instruments.

The graphical language is named "G"(not to be confused with G-code).originally released for the Apple Macintosh in 1986,LABVIEW is a commonly used for data acquisition, instrument control and industrial automation on a variety of platforms including Microsoft Windows, various version of UNIX,LINUX, and MAC OS X. The latest version of LABVIEW is labview2012, released in August 2012 [Fan Jiang & Shaoping Ku, 6].

3.2. Graphical Programming

LABVIEW ties the creation of user interface (called front panels) into the development cycle. LABVIEW programs/subroutines are called virtual components: a block diagram, a front panel and instruments (VIs). Each VI has three a connector panel. The last is used to represent the VI in the block diagrams of other, calling VIs Controls and indicators on the front panel allow an operator to input data into or extract data from a running virtual instrument. However, the front panel can also serve as a programmatic interface. Thus a virtual instrument can either be run as a program, with the front panel defines the inputs and outputs for the given node through the connector panel. This implies each VI can be easily tested before being embedded as a subroutine into a larger program.

3.3. Front Panel of Labview

In addition to the hardware bus to control an instrument, software for the PC is also needed. Virtual Instrument Software Architecture, or VISA. Application development

environments can support instrument control by supporting VISA. Environments supporting VISA include LABVIEW, Lab windows/CVI, and VEE. Furthermore the VISA library can support programming languages like C, C++, C# and others [Sandeep Kumar et al., 7].

3.4. Acknowledgment

The Monitoring unit amalgamates the components GPS module, display unit, transmission unit, micro controller and buzzer for indication. Through the GPS calculation, Location of the boat is monitoring continuously and transferred to the remote station after minimal processing steps. The border areas latitude and longitude details are stored in the controlling unit. If a vessel crossing the border the controlling unit will provide an alert through buzzer through the radio frequency transmitter. When any damage or sinking of boat causes The Emergency button will be pressed, an GSM signal carrying the latitude and longitude information will be send to the sea shore and it is possible to locate them easily.

IV. IMPLEMENTATION

Figure 8: Implementation

By keeping the kits in the entire boats and by knowing the location of all the boats we can use our kit to assist the traffic. In case of any accident on the sea, it can be detected by system and accident location of the boat is sent to the control room.

V. CONCLUSION

Thus, the fisherman 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.

The project generates alarm if they crossing the border by mistake. The simple circuitry makes the project low cost product which can be purchased even by illiterate people.

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