# BORDER CROSSING INTIMATION TO SOLDIERS FROM CAMP USING RECEIVED SIGNAL STRENGTH INDICATION.

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**Abstract:** The Security of a nation depends on its Army and the efficiency of its army depends on it soldiers. For an indestructible army, the soldier's security is the most important factor to achieve and maintain National security. Our project mainly focuses on a system which can identify border to protect our soldier. The existing projects are not powerful enough to prevent the soldiers from crossing the border as it only gives the data about the border but not about the exact distance that the soldier has travelled from the border. In our project the technology of Received Signal Strength Indication (RSSI) is used which indicates the power level received by the antenna, this information is used to provide geographic location of soldiers with respect to the border. The proposed systems receiver's section includes ARDUINO MEGA microcontroller, ESP8266 RSSI module, Audio Playback Recorder (APR) voice alert circuit, Liquid Crystal Display (LCD) and Global System for Mobile Communication (GSM) module. The transmitter's section includes mobile phone, ESP8266 RSSI module. The Soldier gets continuous updates about his zone, when the soldier goes out of reachable zone, he can alert the base station for help using GSM module.

 **Keywords:** GSM, RSSI, APR,LCD.

## 1. INTRODUCTION
The Soldiers of the country play a vital role in protecting the nation and its people. Soldiers are pivotal element to build a strong army. They serve their country

without any selfish motive and keeping it as their utmost priority .So, the safety of the soldiers plays an indispensable role in it. Concerning the soldier's safety there are many implementations which indicate geographic and health status time to time of a soldier. RSSI is available in almost all wireless nodes and it does not need any additional hardware requirements and it is mainly used as an indicator for localization purposes. The pioneering use of the received signal strength indicator will concede new applications in human position approximation, an eminent function in safe and secure services. GSM module is mainly used for its effective short-range, high speed transmissions and soldier-to-soldier wireless communications which is required in communicating information on situational awareness, strategic instructions, and concealed surveillance related data during superior operations investigation and other missions. So, by using these equipment's and technologies we are trying to contrivance the basic security system for soldier with feasible cost and high reliability.

## 2.MATERIALS AND METHODS

**Existing System:**

The existing system mainly focuses on tracking the soldier and monitoring their health conditions. The technologies used in the above system were Global Positioning System (GPS), GSM and Internet Of Things (IOT) with various Bio-Sensors. Body temperature sensor and pulse rate sensor were used to indicate the health status of the soldier. Our proposed system is used for identifying and detecting the border using RECEIVED SIGNAL STRENGTH INDICATION. Corresponding alert is given to the soldier through LCD, APR VOICE ALERT and GSM.

**Received Signal Strength Indication (RSSI):**

RSSI, or "Received Signal Strength Indication," is an indication of how well a device can hear a signal from its access point or router. It is a value that helps in determining if there is enough signal to get good wireless connection. In telecommunication, received signal strength is an indication of power level being received by the receiving device. RSSI is available in almost all wireless nodes and it does not need any additional hardware requirements and it is mainly used as an indicator for localization purposes. Greater the value of RSSI, greater the signal strength. RSSI based approaches are highly preferred due to their less complexity.

**Proposed System:**

In the proposed system, RSSI method is used to measure the distance between the camp and the soldier. By using this we can determine in which zone the soldier is present. The soldier gets zone updates by LCD and APR voice alert. The base station also gets updates about soldiers' location simultaneously. Whenever the

soldier is about to reach the border the APR voice alerts the concerned person and at the same time GSM is used to send the message from the controller from soldier to base station. When in an emergency the soldier can press the switch to inform the base camp.

**Working Principle:**

The project mainly focuses on identifying the border and helps in indicating in which zone the soldier is present with the help of signal strength. Based on the signal strength the TRI-zonal implementation is designed .The output is given through LCD, Speaker and Message(from GSM).
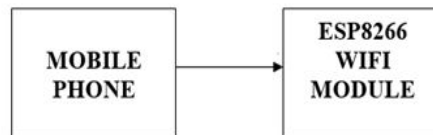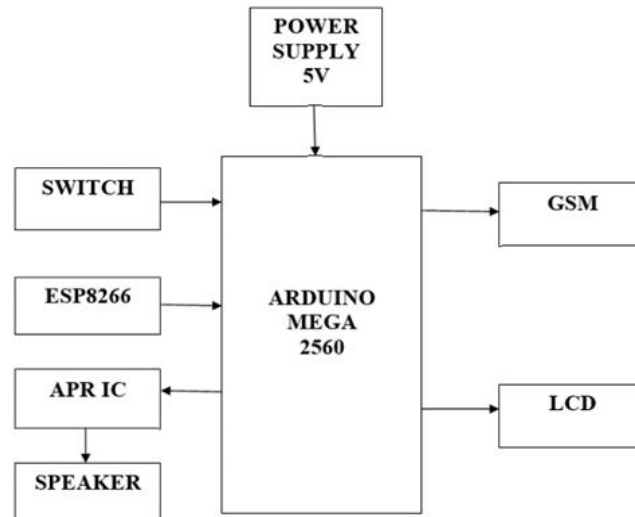


FIGURE 1: TRANSMITTER SECTION



FIGURE 2:RECEIVER SECTION

**Module Description:**

**1. Module I - Border Identification:**

Border is identified based on the received signal strength and they are divided into three major zones.

**2. Module II-Border Indication:**

TABLE 1: TRI-ZONAL IMPLEMENTATION

| S.NO | SIGNAL STRENGTH | ZONES | COLOR INDICATION |
|---|---|---|---|
| 1 | 0-50 dBm | SAFE ZONE | GREEN |
| 2 | 50-70 dBm | MID ZONE | YELLOW |
| 3 | Above 70 dBm | DANGER ZONE | RED |

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Once the border is identified, the alert is provided to the soldier through LCD DISPLAY and APR alert.

➢ Safe Zone: Signal Strength in Safe Zone will be in the range of "0-50 dBm" .In this case the LCD monitor will display a message that "SAFE ZONE 0-50 dBm" with dBm specified. In Base Camp "GREEN LIGHT" is displayed indicating SAFE ZONE.

➢ Intermediate Zone: Signal Strength in this zone will be in the range of "50-70 dBm". When the soldier is in this zone an alert message is provided through APR VOICE saying he is in "MID ZONE". The LCD displays the message "MID ZONE 50-70 dBm" with dBm .Camp is indicated with "YELLOW COLOR" showing INTERMEDIATE ZONE.

➢ Danger Zone: The Signal Strength above 70 dBm indicates danger zone. When the soldier is about to reach the border an APR voice alert is constantly intimating through speaker that "SOLDIER REACHED OUT OF RANGE". The LCD display shows the message "DANGER ZONE above 70 dBm" and "MESSAGE SENT". When the soldier is crossing the border a message is sent to him through GSM. Base camp is displayed with "RED LIGHT" indicating DANGER ZONE.

**3. Module III – Emergency Situations**:

When the soldier is in any trouble or when he is unaware of his location, Switch is pressed by the soldier which helps in transmitting message to the base camp through GSM seeking for help. "I AM IN EMERGENCY SITUATION" message is delivered to the camp.
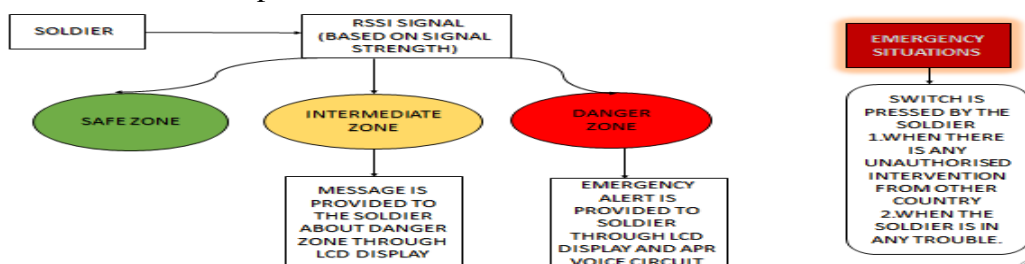
FIGURE 3: DATA FLOW DIAGRAM

**Results and Discussion**

The border identification system is hence achieved by the proposed system. This system helps in protecting our soldiers whose utmost priority is our nation's security. The RSSI method plays a vital role in determining the zone by which we can identify how far the soldier is from border. The soldier gets zone updates by LCD and APR voice alert. The base station also gets updates about soldiers' location simultaneously. Whenever the soldiers about to reach the border the APR voice alerts the concerned person and at the same time GSM is used to send the message from the controller from soldier to base station. When in an emergency situation, the soldier can press the switch to intimate base camp for help. The outcome of this project helps in securing the lives of soldiers and simultaneously alerting the base camp about soldier's geographic location through secure network.
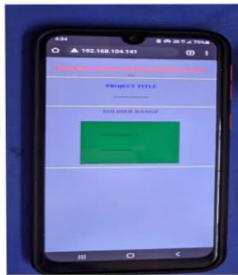


TRANSMITTER

RECEIVER
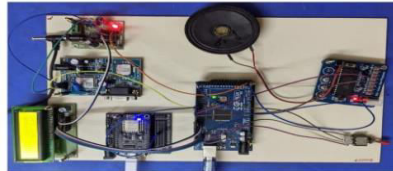
## 3.CONCLUSION

Thus, this project succeeds in identifying the geographic location of soldiers and hence also prevents the soldier from crossing the border. Safety is assured to the soldier by constant monitoring from the base camp. It is the useful device for the safer navigation for the soldier. The system is an efficient way of navigating from base camp to borders without any concern of information theft of their location as the wireless network is secure. The main advantage of this project is that it is implemented at low cost and through wireless system which helps in securing the network. Due to the need of more secure network and the increase in the need of national security due to the deteriorating inter-national relationship with neighboring countries the security of soldiers becomes priority for safeguarding the country.

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