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# Defending the Nation with Innovative Problem Solving Solution for the Army

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**ABSTRACT--**The primary objective of training individuals in the military is to ensure national security. However, it can be challenging to maintain constant vigilance as the enemy can attack at any time and from any direction. To address this issue, a system has been developed that utilizes a shoe model equipped with a transmitter, receiver, relays, mine system (receiver), live current wires, light, and buzzer to alert the army camp. The transmitter is embedded in the shoe, allowing communication and signal transmission to the receiver. The receiver distinguishes between friend and foe, detecting signals from the shoe's transmitter. This system has an advantage due to its compact size compared to other systems. The hardware of the system is designed to detect enemies within a specific range set in the army camp, and it can be modified for chip-based identification. If the enemy attempts to enter the army camp through deception, the system provides protection through electrically charged fences that shock the intruder. Even if the enemy manages to enter the next zone without the shoe model's transmitter and receiver system, the system alerts the defense army with an alarm.

**KEYWORDS:**Shoe model transmitter,receiver,relays,minesystem,live current wire.

## I.INTRODUCTION

The task of saving lives and safeguarding the nation from enemy armed forces is challenging. To aid the defense armed forces, a system has been developed that functions as an alert system, which operates 24/7. This system serves as both a defense mechanism and an alert system, ensuring the safety of soldiers and critical documents. It is efficient, cost-effective, and precise. Although people are trained to safeguard the nation, remaining alert for 24 hours is difficult as the enemy can attack at any moment and from any direction. This system consists of a Shoe Model comprising a transmitter, receiver, relays, mine system (receiver), live current wires, light, and buzzer to alert the army camp. The transmitter communicates with the receiver via the shoes. The receiver detects the signal from the shoe's transmitter and differentiates between the enemy and the defense soldier. The system is compact in size and can be tailored to detect enemies within a specific range set in the Army camp, which can be modified for chip-based identification. If the enemies enter the army camp through deception, the system triggers a fence that carries an electric current, delivering a shock to the intruder. Even if the enemy attempts to enter the next zone without the transmitter and receiver system, the system alerts the defense army through an alarm.the system can be configured to provide an alert in case of unauthorized movement or tampering with sensitive documents or equipment, minimizing the loss of critical information during an attack. The shoe model used in this system is comfortable to wear and does not hinder the soldier's movement, making it an ideal solution for soldiers who need to remain alert and mobile at all times. Overall, this system provides an effective defense mechanism and alert system that helps safeguard the nation and its defense forces.

## II. PROBLEM STATEMENT

Ensuring a strong security system within the military is crucial to prevent security breaches and attacks. This highlights the need for proper implementation of security measures. Identification and verification of friendly and enemy forces at the border can be complicated. Therefore, standardized protocols are necessary to prevent misunderstandings and avoid friendly fire incidents. Protecting the borders 24/7 presents significant challenges, and it requires a comprehensive and standardized approach. This approach should include advanced surveillance technology, well-defined standard operating procedures, and coordinated efforts among different units and agencies

### III. METHODOLOGY

The block diagram illustrates the distribution of electronic parts, including a transmitter and a receiver, which communicate via radio waves to send control signals. Upon receiving the control signal from the transmitter, the receiver commands the output, and the relay is activated accordingly, making or breaking the circuit to the current wires. The transmitter and receiver configuration includes shoes that protect against electric shock from live wires, preventing accidents for authorized personnel, while potentially exposing enemies without such protection to electric shock. In the event of an escape from the fenced area, the mine system detects the breach and triggers a signal, alerting the camp through a buzzer sound alarm and light alarm notification. The entire system is powered by a battery or main supply, providing a reliable source of power for its operation.

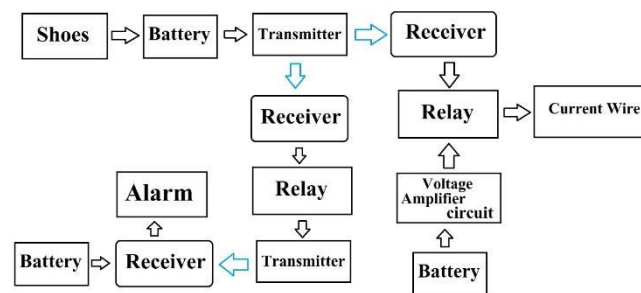


Fig.1 Block Diagram of defence system

In the designed system, the defending army force personnel wear specialized shoes that are configured to interact with the main system. When these personnel come into contact with the main system, the receiver receives a signal and turns off the relay, preventing any current flow and protecting the personnel from electric shock. On the other hand, if opponent army force personnel without the designated shoes come into contact with the main system, the mains do not receive the signal, and the relay is turned on, resulting in current passing through the system and causing electric shock to the personnel. Additionally, underground sensors are strategically placed to detect the presence of sensor-less shoes worn by enemies who may have breached previous levels of defense. This triggers a signal that alerts the defending force, allowing them to be alert and take appropriate action. The standardized use of specialized shoes and underground sensors enhances the security of the system, aiding in the detection and differentiation of friendly and enemy forces, and helping to prevent unauthorized entry into the border area.

### IV. FUNCTIONAL PARTITIONING

#### 1. General circuit board

A general circuit board (GCB) or general wiring board (GWB) is a component commonly used in electrical and electronic engineering to interconnect electronic elements in a controlled manner. It consists of a sandwich structure which is laminated and composed of conductive and insulating layers. The conductive layers are having the artwork traces, planes, and other features and patterns, which is similar to the structure of a wires on a flat surface and are inscribed by one or more layers of copper laminated onto and between insulating substrates. Electrical components can be attached to conductive pads on the board's external layers using soldering or other methods to provide both electrical connections and mechanical fastening. Vias, which are plated-through holes that permit interconnections between layers, can also be added during manufacturing.

#### 2. Relays

A relay is an electrical device used to control high voltage or current loads, such as motors, lights, or appliances. The T90 6V 30A Relay from EF is a type of relay that operates with a 6V DC signal and has a maximum current capacity of 30A. It is a single pole double throw (SPDT) relay, which means it has three terminal connections for NO (normally open), NC (normally closed), and COM (common). The relay features two COM terminals that are connected to each other. The HKV6 DC 12V 5V relay is another type of electromechanical device commonly used in electronic circuits. It operates with a 5V control signal and can switch loads with a maximum voltage of 12V DC. When a control signal is sent to the relay, the electromagnetic coil within it generates a magnetic field, which attracts the contacts and brings them together. This, in turn, allows the current to flow through the connected load.



### 3. 4CH Remote Control Transmitter Receiver Circuit

The 4CH Remote Control Transmitter Receiver Circuit is a plastic and electronic device that provides continuity and a long service life. It is designed for use with toy models, remote control buses, and remote control boats, allowing for control over movement direction, such as forward and backward motion. The RC transmitter and receiver's electronic frequency is 27 MHz. Adding a motor with a fire capacitor can increase the sensitivity of the RC remote control transmitter. The size of the two RC transmitter voltages' affair can be determined by the voltage difference, and if the battery power is low, it is recommended to use a separate voltage for the steering machine.

### 4. Diode

A diode is a semiconductor device that functions as a one-way switch for electric current, allowing easy inflow in one direction while oppressively confining inflow in the contrary direction. Due to this property, diodes are also appertained to as cures, as they can convert interspersing current( AC) into palpitating direct current( DC). The standing of diodes is determined by their voltage, current capacity, and type

### 5. Capacitors

A capacitor, also known as a condenser, is an electrical element with two outstations that passively stores energy electrostatically in an electric field. Samwha's atomic aluminum electrolytic capacitors give excellent smoothing capability and high ripple current at high frequentness, making them ideal for colorful products. These capacitors are largely dependable and have a long lifetime of over to 12,000 hours.

### 6. Batteries

A battery is a device designed to store chemical energy and convert it into electrical energy. The chemical responses being within a battery involve the transfer of electrons between two accoutrements, known as electrodes, through an external circuit. This inflow of electrons generates an electric current that can be exercised to perform work.

### 7. Electicalfensing system

An electric fencing system is a hedge that uses electrical shocks to help creatures or humans from crossing a boundary. generally, the system consists of a hedge line charged with an electric current from a power source, similar as a battery or mains electricity. When a person or beast touches the line, they admit an electric shock, which is safe but unwelcome enough to discourage them from crossing the hedge.

### 8. LED

LED stands for Light Emitting Diode. These lighting products are able of producing light up to 90 more efficiently than traditional incandescent light bulbs. The process by which they serve involves an electrical current passing through a microchip, which also causes the illumination of bitsy light sources known as LEDs. As a result of this process, visible light is produced.

### 9. Resistors

A resistor is an electrical element with two outstations that passively implements electrical resistance as a circuit element. Resistors are used in electronic circuits for a variety of purposes, including reducing current inflow, conforming signal situations, dividing voltages, turning active rudiments, and terminating transmission lines. In certain operations, high- power resistors able of dissipating significant quantities of electrical power as heat may be used as part of motor controls, power distribution systems, or test loads for creators. Fixed resistors retain resistances that change only minimally with temperature, time, or operating voltage. Variable resistors can be employed to acclimate circuit rudiments

### 10. Buzzer

Buzzer or beeper is a common audio signaling device used to produce a buzzing or telephoning sound. These bias can be either mechanical, electromechanical or piezoelectric( frequently appertained to as" piezo"). They're constantly employed as alarm bias, timekeepers, and evidence signals for stoner input, similar as a mouse click or keystroke. Buzzers and beepers are extensively used in a variety of operations, including security systems, medical outfit, and artificial robotization. They're generally small and compact, making them easy to integrate into electronic bias. Piezoelectric buzzers are the most generally used type of buzzer due to their low power consumption, high trustability, and continuity.



## V. ADVANTAGES

- This system helps as a security for an army border.
- By this system there is a possible of saving Soldiers live.
- By this system the army can take rest while doing his continuous monitoring the border.
- Less power consumption.
- By this project the important data of army can be saved.

## VI. CONCLUSION

The need for an innovative problem-solving system for defending armies has become increasingly important in recent years. As terrorist and enemy attacks become more frequent, it is imperative that the army is able to detect the entry of unauthorized personnel into their borders and take proactive measures to safeguard the lives of soldiers and protect important data. A system that is capable of alerting the army in real-time is necessary for successful prevention of terrorist attacks and infiltration. The proposed system should be designed to work around the clock, 24 hours a day, to ensure that the army is always on high alert. To achieve this, a combination of technologies and techniques should be employed. One such technology is the use of artificial intelligence (AI) and machine learning algorithms to detect and analyze data from various sources, including cameras, sensors, and drones. The data can then be processed and analyzed in real-time, allowing the system to identify suspicious activities or movements and alert the army immediately. In addition to AI and machine learning, the system should also incorporate other technologies, such as biometric identification and authentication systems, to ensure that only authorized personnel are allowed to enter the army camp. This will prevent unauthorized entry, and in the event that an infiltrator does gain access, the biometric systems can be used to quickly identify and apprehend them.

Another crucial aspect of the system is the ability to safeguard important data available in the army camp. The system should be designed to detect and prevent cyber attacks and data breaches. This can be achieved through the use of advanced encryption technologies, firewalls, and intrusion detection systems. Additionally, the system should be designed to provide redundant backup mechanisms to prevent data loss in case of a system failure or attack. In terms of implementation, the system can be designed as a centralized control center, where all data from various sources are collected, analyzed, and acted upon. The control center can be staffed by trained personnel who are responsible for monitoring and managing the system, including responding to alerts and taking necessary actions to safeguard the lives of soldiers and protect the data.

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