



## **Stun Gun-Self Defense System with GSM SOS Message Alert**

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### **ABSTRACT**

The STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT is a project aimed at enhancing personal safety by combining a stun gun with a GSM SOS message alert system. The stun gun is designed to immobilize an attacker temporarily, providing the user with an opportunity to escape or seek help. The GSM SOS message alert system allows the user to send a distress signal to pre-selected contacts via SMS when the stun gun is activated. The project involves designing and developing a compact and portable device that incorporates both the stun gun and GSM SOS message alert system. The device's hardware components include a stun gun circuit, microcontroller, GSM module, and battery, while the software components include code for controlling the device's operations and sending SOS messages. The STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT project aims to provide an effective and efficient solution for personal safety, especially in situations where an individual faces physical assault or danger

### **1. Introduction**

The STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT is a project aimed at enhancing personal safety and security. The system is designed to provide an effective means of self-defense against potential attackers, while also alerting emergency contacts in case of danger.

The project consists of a stun gun that can deliver an electric shock to an attacker, incapacitating them and allowing the victim to escape. Additionally, the system is equipped with a GSM module that sends an SOS message to pre-programmed emergency contacts when activated. This feature ensures that help can be dispatched immediately, even if the victim is unable to call for assistance themselves.

The stun gun is powered by a rechargeable battery, and the system is designed to be easy to use, with simple controls and clear instructions. It can be carried discreetly in a purse or pocket, and can be quickly and easily activated in case of an emergency.

The aim of this project is to provide individuals with an effective and reliable means of self-defense, as well as a way to alert others in case of danger. It is hoped that this system will help to reduce the incidence of violence and provide greater peace of mind to those who use it.

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### **2. Motivation :**

#### **ETHICAL :**

1. In 2019 a total of 4977 children below the age of 18 were sexually assaulted in India. Among them 26% of the girls were in capable of basic self-defenses.
2. The 2019 National Crime Record Bureau reports shows a 7.3% increase in crime against women.
3. Although India's largest self-defense program is yet to be accessible to all the girl in the country. The NSDC urges every community to inculcate self-defense practices among their girls.

#### **TECHNICAL :**

The technical motivation behind the development of the STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT is to provide a personal safety solution that can be used in dangerous situations where a person may be threatened or attacked. The system combines the functionality of a stun gun and a GSM-based alert system to provide immediate assistance to the user in case of an emergency.

The stun gun is a non-lethal weapon that can immobilize an attacker temporarily, giving the user enough time to escape or seek help. The GSM-based alert system, on the other hand, allows the user to send a distress signal to pre-defined emergency contacts or a threatening situation. This can be especially useful in situations where the user is unable to call for help or is in a location where there is no phone coverage.

The technical design of the STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT involves integrating the stun gun and the GSM-based alert system into a single device. The device is designed to be portable and easy to carry, making it convenient for the user to keep it with them at all times. The device is also equipped with a rechargeable battery, allowing the user to use it multiple times.

In summary, the technical motivation behind the STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT is to provide an effective personal safety solution that can be used by anyone in potentially dangerous situations. The system combines the functionality of a stun gun and a GSM-based alert system to provide immediate assistance to the user in case of an emergency.

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### 3. Literature Survey :

The paper [1] proposes a safety device and application called FEMME using ARM controlled for women safety. The device can be purchased or the application can be installed in smart phone for access of emergencies. The application has power button, numbers, SOS, video, audio recorder and hidden camera detector. When the button is pressed then the device is linked with the smart phone and tracks the GPS location. After the double click, the audio will get recorded and long pressed button will result in calling emergency number.

The paper [2] proposes model of a band which provides safety to women. The band works in two ways: First, when the threat arrives then by pressing the panic button the present location of victim will get tracked with help of GPS modular. Secondly, If the body freezes totally then the motion sensor will continuously send the value to the micro-controller which will be compared with the threshold value.

The project STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT is a unique self-defence system that combines a stun gun with a GSM SOS message alert system. The system is designed to provide users with a quick and effective means of defending themselves in the event of an attack while also alerting emergency services.

A literature survey of the project reveals that stun guns have been used for self-defence purposes for many years. A stun gun is a non-lethal weapon that delivers a high-voltage electric shock to an attacker. The shock immobilizes the attacker by causing muscle contractions and disorientation, giving the victim time to escape or call for help.

In recent years, there has been an increasing interest in combining stun guns with other technologies to enhance their effectiveness. The GSM SOS message alert system used in this project is one such example. This system allows the user to send an SOS message to emergency services with the press of a button. The message includes the user's location and other important information that can help emergency services respond quickly.

Several other projects have explored similar ideas. For example, the Smart Cap project developed by researchers at the Indian Institute of Technology (IIT) Delhi is a wearable cap that can detect an attack and send an SOS message to a user's emergency contacts. Another project, the Guardian Angel necklace, developed by students at Texas A&M University, is a necklace that includes a panic button that can be used to send an SOS message to emergency services.

In terms of the technical aspects of the STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT, the project uses an Arduino micro-controller to control the stun gun and the GSM module. The system is powered by a rechargeable battery, and the stun gun and GSM module are housed in a custom-designed case. Overall, the STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT is an innovative self-defence system that combines a stun gun with a GSM SOS message alert system. While similar projects have been developed in the past, the unique combination of technologies used in this project make it a valuable addition to the field of self-defence systems.

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### 4. Design Methodology & Working :

The working of our project Self Defense System with SOS GSM Message Alert is described below:

As soon as the switch is pressed the Lead-Acid battery give a 4V Direct Current (DC) to NPN Transistor which acts a inverter circuit and covert to DC to pulsating high voltage and low current AC. After which the AC voltage is passed through a Step-up Transformer which takes that Step-up the voltage from 4V to 15KV. Thus, producing a very high voltage AC which is used as the output to immobilize an attacker without causing serious injury.

The additional security that our project provide is that if ever our user fails to aim at the correct target point, the switch of the stun gun pressed sends a signal to the GSM which is used to send emergency alert message to the prefaded emergency numbers.

## 5. Components Used :

1. Lead Acid Battery (4 Volt)
2. N-P-N Transistor (D880)
3. Diode (UF 4007)
4. Resistor (1K Ohm)
5. Step-Up Transformer (15 kVA)
6. Switch and Push button
7. GSM Module (SIM 900A)
8. Arduino Uno

## 6. Circuit Diagram :

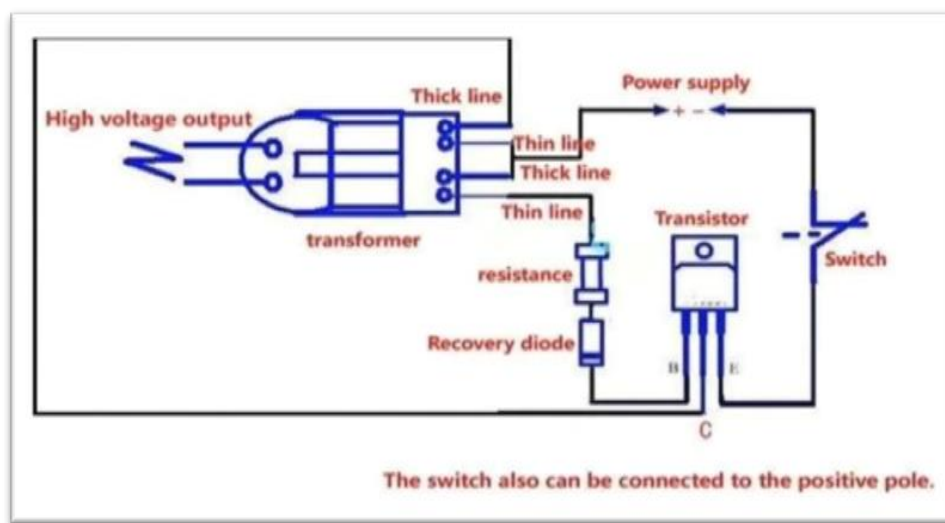


Fig.1 Circuit Diagram of high voltage generator

## 7. Circuit Description:

High voltage generator circuit produces a high voltage, low current signal and we can use it as a weapon to electrocute the target to weaken them temporarily. However, in some countries, stun gun is illegal. Because, this is actually a lethal weapon which can paralyzed a person. It is usually powered by a 4V battery. Here, we design this circuit using a 4V Lead-Acid Battery, an NPN transistor, step-up transformer. If ever our user fails to aim at the correct target point, the switch of the gun pressed sends a signal to the GSM which sends emergency alert message and call to the preferred emergency numbers.

- As soon as the switch is pressed the Lead Acid battery produces a 4v Direct Current (DC) Voltage. It is then passed to NPN transistor base is connected to the primary side of the transformer with a diode and resistor.
- Here the NPN transistor acts as on/off switch which help to produce a pulsating ac voltage.
- After which it passed through the Step-Up Transformer which steps-up the voltage from 4 volt to 15Kv.
- If ever our user fails to aim at the correct target point, the switch of the stun gun pressed sends a signal to the GSM which is used to send emergency alert message and call to the preferred emergency numbers.

## 8. Hardware Implementation :

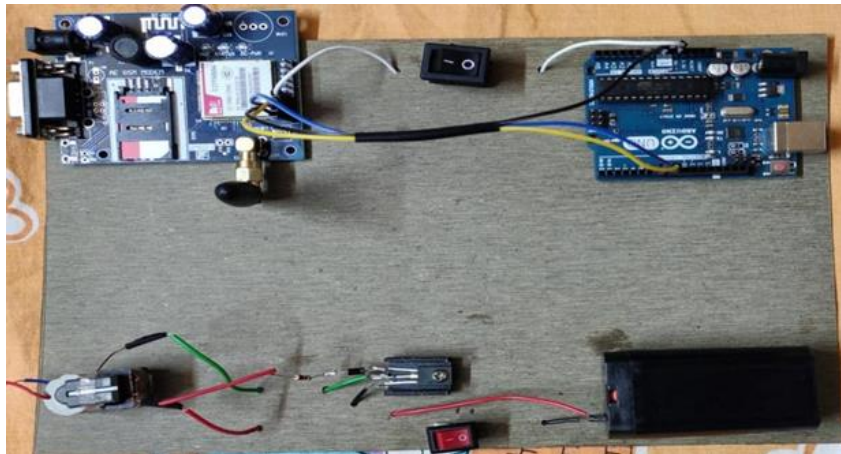


Fig.2 Structure of Stun Gun

## 9. Arduino Code for GSM Module :

```
#include <SoftwareSerial.h>
SoftwareSerial gsmSerial(2,3); // Rx, Tx
String phone_no1 = "+919749161040";
String phone_no2 = "+916296506820";
String phone_no3 = "+918918007563";
String sms = "EMERGENCY!"; // Message to be sent
void setup(){
  gsmSerial.begin(9600);
  delay(5000);
  sendSMS(sms, phone_no1); // Sending SMS message to phone_no1
  sendSMS(sms, phone_no2); // Sending SMS message to phone_no2
  sendSMS(sms, phone_no3);
  makeCall(phone_no1); // Making a phone call to phone_no1
  makeCall(phone_no2);
  makeCall(phone_no3);
}
//SendSMS function
void sendSMS(String sms, String ph){
  gsmSerial.println("AT");
  delay(1000);
  gsmSerial.println("AT+CMGF=1"); // Configuring TEXT mode
  delay(1000);
  gsmSerial.println("AT+CMGS=\"" + ph + "\"");
  delay(1000);
  gsmSerial.print(sms);
  delay(1000);
  gsmSerial.write(26);
  delay(1000);
}
//MakeCall function
void makeCall(String ph){
```

```
gsmSerial.println("ATD" + ph + ";");  
delay(10000); // Wait for 10 seconds or until the call is answered  
gsmSerial.println("ATH"); // End the call  
}
```

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## 10. Discussion :

The STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT is a project that aims to provide individuals with a self-defence mechanism that is coupled with an alert system. While this project has its benefits, it has some limitations. Some of these limitations include:

**Legal considerations:** The use of stun guns is illegal in some countries, states, and cities. Therefore, before implementing this project, it is essential to ensure that it is legal in your area.

**Safety concerns:** The use of stun guns can be dangerous, especially if not used properly. There is a risk of causing harm to oneself or others. Therefore, it is important to educate users on the proper use of stun guns and ensure that safety measures are in place.

**GSM network coverage:** The GSM SOS message alert feature relies on a GSM network to send alerts. If the user is in an area with poor or no network coverage, the alert may not be sent, rendering the system ineffective.

**Battery life:** The stun gun and GSM SOS message alert system require a power source to function. If the battery is not charged, the system will not work. Therefore, users must remember to charge the battery regularly.

**Cost:** The STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT is a relatively expensive project to implement. The cost of the components required may be prohibitive for some users.

**False alarms:** The GSM SOS message alert system may be triggered accidentally, leading to false alarms. This may result in unnecessary panic or confusion.

**Limited range:** The GSM SOS message alert system has a limited range. If the user is outside the range, the alert may not be sent, and help may not arrive in time.

Overall, while the STUN GUN - SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT has its benefits, it is important to consider the limitations before implementing it. Users should carefully evaluate their needs and assess whether the benefits outweigh the limitations.

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## 11. Conclusion :

- Here, we have come to the end of the project on women safety device using GSM SOS message system. We tried our best to include all the necessary points that are required related to the given topic. This report contains information of our project thoroughly. We hope that our project will be useful and may be effective.
- In our project "SELF DEFENSE SYSTEM WITH GSM SOS MESSAGE ALERT" comprises with various technology present for the safety of women in which the real time defense and alert message transmission occurs simultaneously.
- In this stun gun there is a 15% chance that it may not immobilize the assaulter, but the SOS message will get delivered successfully.

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## 12. Future Work :

- We aim to work on the shape and size of the stun gun so that it can be carried anywhere.
- If the low frequency was chosen because of an iron core transformer, it should be replaced with a ferrite core, because it is: more efficient, can handle higher frequencies, is lighter, and more compact for a stun gun.
- Finally, the transformer does not respond more strongly to a longer duty cycle after a point, so there is definitely wasted input there also.
- Also, we add some extra features in GSM module like location tracking using GPS module.

### *Acknowledgements*

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***An example appendix***

Authors including an appendix section should do so before References section. Multiple appendices should all have headings in the style used above. They will automatically be ordered A, B, C etc.

***Example of a sub-heading within an appendix***

There is also the option to include a subheading within the Appendix if you wish.

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**References**

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- [1] International Journal of Engineering Research & Technology (IJERT) Vol. 7 July-2018.
- [2] Indian Journal Of Science And Technology, May-2020
- [3] Procedia Computer Science, Vol.16 , January-2020
- [4] International Research Journal of Modernization in Engineering Technology and Science, Volume:03/Issue:11/November-2021
- [5] Digital circuit /Digital Integrated Budronies “by H.Taub D .schilling.
- [6] Sinclair Ian R. and Dunton John, Practical Electronic Handbook, 6th Edition, 2007. 3. Beginning C, Wrox Press Ltd, Birmingham, U.K, 2nd Edition, 2002
- [7] Deshmukh V Ajay, Microcontrollers Theory and Applications, New Delhi, Tata McGraw-Hill Publishing Co. Ltd, 2005.