

Safe soul(sole)

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ABSTRACT

The status of women in India has been subject to many great changes over the past few centuries. From equal status with men in ancient times, through the low points of the medieval period, to the promotion of equal rights by many reformers, the history of women in India has been eventful. However, women in India continue to face atrocities such as rape, acid throwing and dowry killings while young girls are forced into prostitution; as of late rape has seen a sharp increase following several high profile cases of young girls brutally raped in public areas. According to a global poll conducted by Thomson Reuters, India is the "fourth most dangerous country" in the world for women and the worst country for women among the G20 countries. Unfortunately, the news has recently been dominated by instances of kidnapping, rape, and abuse. The need for a project that instructs young girls how to defend themselves is immense. Recent mobile devices are integrated with various kinds of sensors, thereby allowing people to capture what stationary sensing devices cannot easily acquire. There is no such system which can provide the safety to girls and therefore the girl cannot move freely. There are different products for the girls' safety such as shoes, sprays, etc. But these cannot provide safety in the adverse conditions. We are designing a module which will help the girl to protect herself. So this project is focused on providing innovative way to provide girl safety.

Keywords — GPS modem, GSM modem, Buzzer, Inverter, Pressure sensors, Servo Motor

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I. INTRODUCTION

What are the social security needs of women in India? What are the gaps in the social security discourse for women in India? How can these gaps be bridged? How can the social security system in India recognize and honor women's rights to social security in their individual capacities as rights-holders apart from their position in a household, their age or marital status? How can the women have platforms to share their concerns and influence policy-making? Girls in any major cities face a scenario when they are in danger of sexual harassment. Most of the time there is no immediate way to notify someone at the time of the danger. Enter Safe Soul (Sole). This product is an insole for any normal shoe that offers the option to ping your location along with a customized message to a number of the user's choice and to a nearby police station just by tapping the heel of the shoe hard enough or vigorously moving the shoe. It has an inbuilt siren that also gets triggered by tapping which thereby

triggers a 190V rms ac voltage to give the person committing the crime it will deliver an electric shock which may give the victim a good chance to escape. This is enough for anyone in a range to notice in the case of imminent danger. It also features a concealed knife which extends from the toe of the wearer's shoe which will show up to function when required

1.1 Objective of proposed work:

1. Girls in any major cities face a scenario when they are in danger of sexual harassment. Most of the time there is no immediate way to notify someone at the time of the danger.
2. There is no such system which can provide the safety to girls and therefore the girl cannot move freely.

3. There are different products for the girls' safety such as shoes, sprays, etc. But these cannot provide safety in the adverse conditions.
4. We are designing a module which will help the girl to protect herself. The module will be fitted to the girls' sandals.
5. When the module she can give shock to the person harassing her. Module which will help the girl to protect herself.
6. The module will be fitted to the girls' sandals which will got activated or made ON when a girl tilt's her sandal.
7. As soon as girl tilt's her sandal, hooter will be blown so that people present around will come to help the girl/ women.
8. SMS will be send to her guardian and to the police helpline along with the location using GPS and traceable through Google Maps.
9. Thus the girl will be safe and she feels protected.

II. BLOCK DIAGRAM

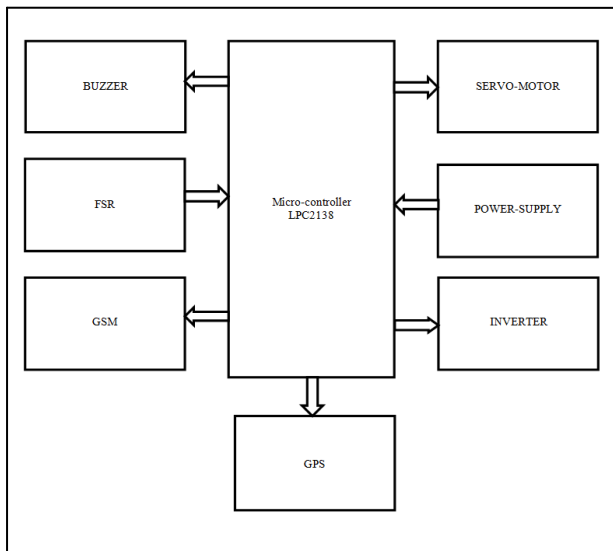


Fig.2.1: Block Diagram

2.1: Block diagram explanation:

2.1.1: LPC 2138

1. 16/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 or HVQFN64 package.
2. 8/16/32 KB of on-chip static RAM and 32/64/128/256/512 KB of on-chip flash program memory. 128-bit wide interface/accelerator enables high-speed 60 MHz operation.
3. Embedded ICE RT and Embedded Trace interfaces offer real-time debugging with the on-chip Real Monitor software and high-speed tracing of instruction execution.

2.1.2: Buzzer

It uses wireless technology and alerts neighbours, pass by and security guards with its loud hooting noise. It is device that makes loud sound than alarm or siren. Hooter will be blown so that people present around will come to help the girl/women.

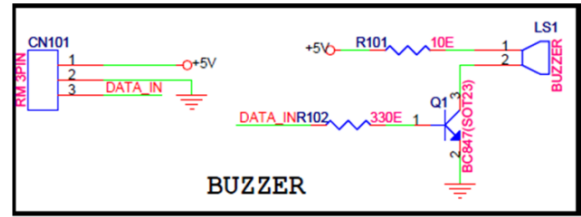


Fig.2.2: Buzzer Circuit

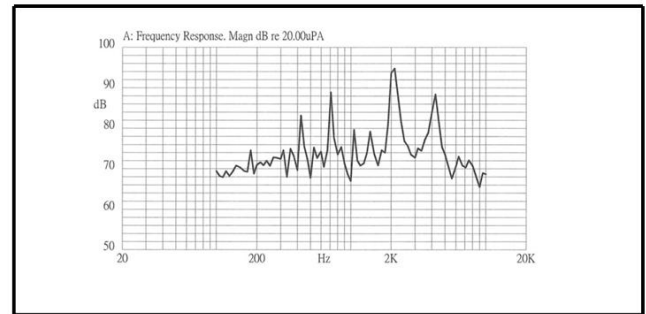


Fig.2.3 Frequency Response Curve

2.1.3: Inverter

The SG3525A pulse width modulator control circuit offers improved performance and lower external parts count when implemented for controlling all types of switching power supplies. The on-chip +5.1 V reference is trimmed to 1% and the error amplifier has an input common-mode voltage range that includes the reference voltage, thus eliminating the need for external divider resistors. A sync input to the oscillator enables multiple units to be saved or a single unit to be synchronized to an external system clock. A wide range of dead time can be programmed by a single resistor connected between the CT and Discharge pins. This device also features built-in soft-start circuitry, requiring only an external timing capacitor.

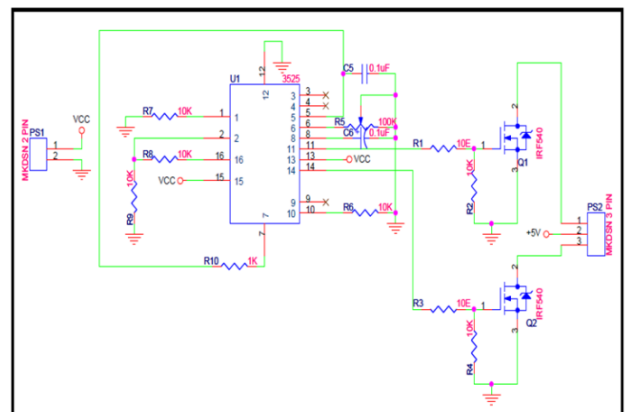


Fig.2.4: Inverter Circuit

2.1.4:FSR (Force Sensitive Resistor)

This is a force sensitive resistor with a square, 1.75x1.5", sensing area. This FSR will vary its resistance depending on how much pressure is being applied to the sensing area. The harder the force, the lower the resistance. When no pressure is being applied to the FSR its resistance will be larger than 1MΩ. This FSR can sense applied force anywhere in the range of 100g-10kg. Force Sensing Resistors (FSR) are a polymer thick film (PTF) device which exhibits a decrease in resistance with an increase in the force applied to the active surface. Its force sensitivity is optimized for use in human touch control of electronic devices. FSRs are not a load cell or strain gauge, though they have similar properties. FSRs are not suitable for precision measurements.

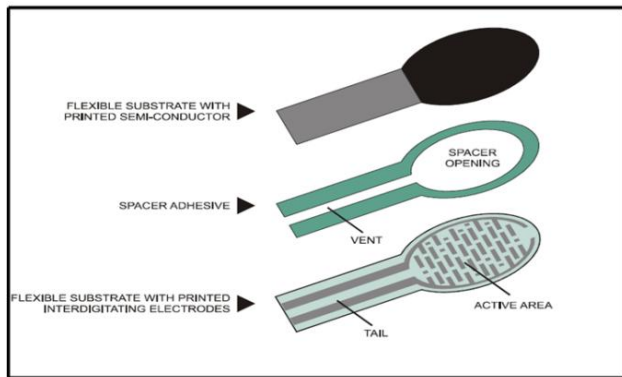


Fig.2.5: Construction of FSR

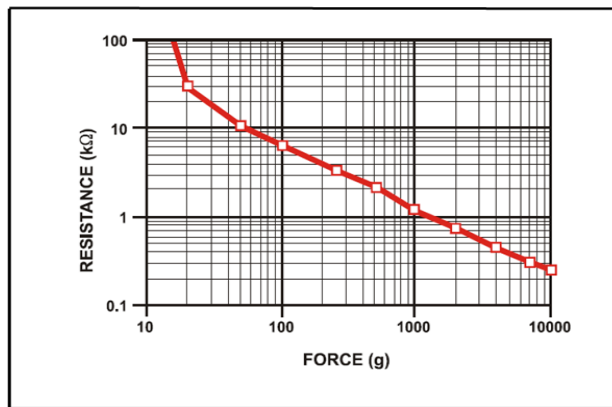


Fig.2.6Force vs. Resistance curve of FSR

2.1.5:Servo-motor(SG90)

Tiny and lightweight with high output power. Servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds but smaller. You can use any servo code, hardware or library to control these servos. Good for beginners who want to make stuff move without building a motor controller with feedback & gear box, especially since it will fit in small places. It comes with a 3 horns (arms) and hardware.

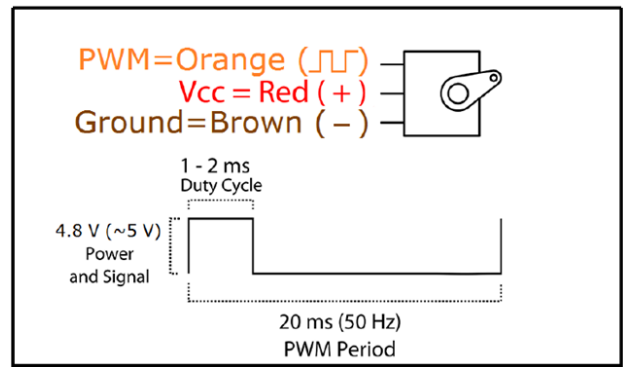


Fig.2.7:Specifications of Servo-motor SG90

2.1.6: GSM

The GSM shield by Arduino is used to send/ receive messages and make/receive calls just like a mobile phone by using a SIM card by a network provider. We can do this by plugging the GSM shield into the Arduino board and then plugging in a SIM card from an operator that offers GPRS coverage. The shield employs the use of a radio modem by SIMComm. We can communicate easily with the shield using the AT commands. The GSM library contains many methods of communication with the shield. This GSM Modem can work with any GSM network operator SIM card just like a mobile phone with its own unique phone number.

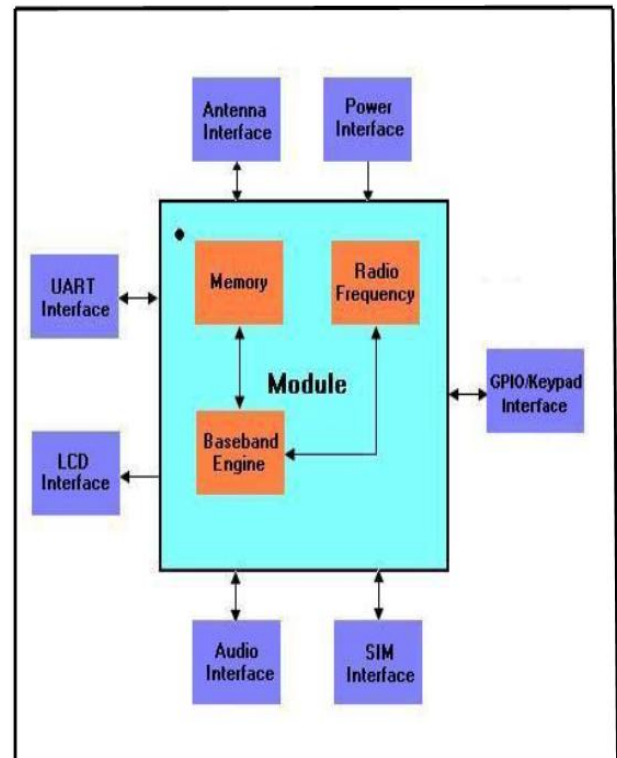


Fig.2.8: GSM Module

2.1.7GPS SIM28ML Module

SIMCom presents a small, high performance and reliable assisted GPS module-SIM28ML. This is a standalone L1 frequency GPS module with the MediaTek MT3337 high sensitivity navigation engine, which allows you to achieves

the industry's highest levels of sensitivity, accuracy, and Time-to-First-Fix (TTFF) with lowest power consumption.



Fig.2.9 SIM28ML Evaluation Board

III. CIRCUIT DIAGRAM

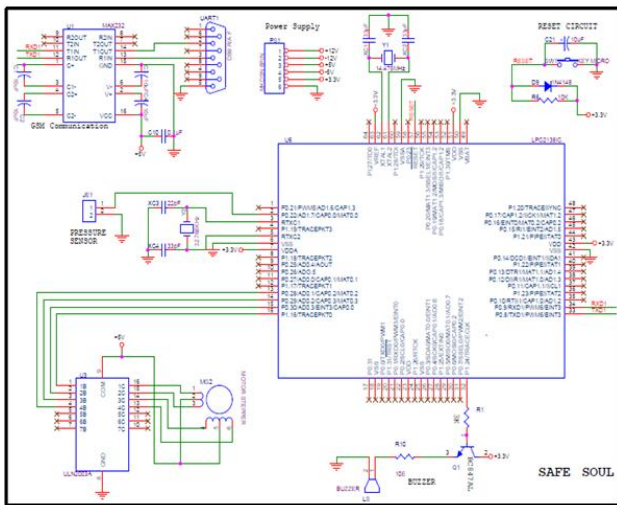


Fig.3.1:Circuit Diagram

1. When the force is acted upon the FSR (Force Sensitive Resistance), its resistance decreases as it is inversely proportional to the applied force thereby increasing the output voltage of the sensor.
2. Here we have considered two levels of threshold voltages. The voltage values below first threshold indicate that the person is normally walking i.e. there is any danger around. So during this stage the buzzer, and the inverter circuit are OFF. This threshold is generalised to such that it takes into consideration the various physical parameters of an average subject (person).
3. The actual working of the system is beyond the first threshold value. The value of voltages above first threshold and below second threshold is set for the

hurried movements of the subject but the situation is not of danger.

4. For instance say the subject is walking hurriedly or for movements that includes rushing just like to take a PMT transport buses. As there is no sign of danger in this case the components are OFF.
5. As the second threshold is crossed the safety components controlled by the LPC 2138 are triggered. Now the force that is applied to exceed the second threshold can be done by multiple tapping of the within a short duration which would lead to a voltage level sufficient to exceed the second threshold voltage value thereby triggering the safety mechanism at that instant of time.
6. The buzzer produces a loud sound thereby managing to get the attention of the people in the vicinity or near-by. Thus any unwanted incident can be prevented.
7. The inverter circuit produces current of sufficient value of voltage to give an electrical shock.
8. This mechanism helps in security even when the subject is in situations where help from other sources is not available.

IV. RESULT

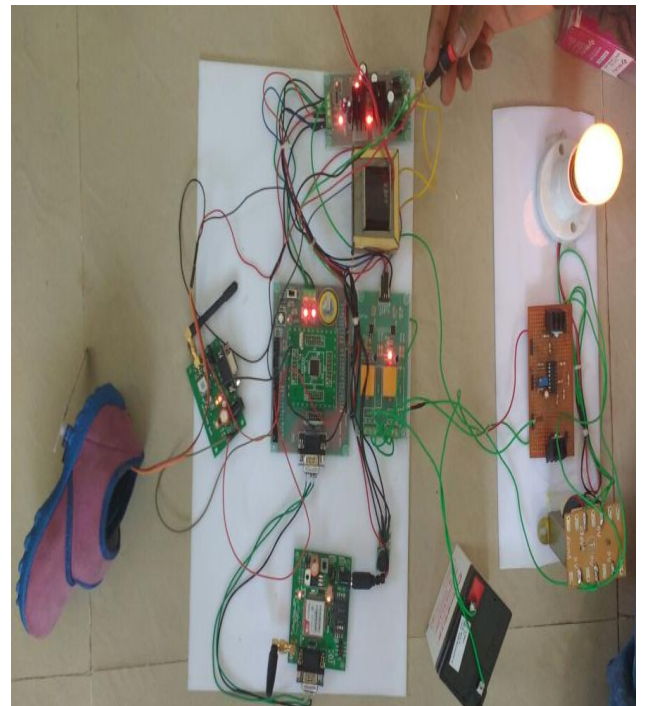


Fig.4.1 Result of Prototype of Safe Soul(Sole)

V. FUTURE SCOPE

1. With flexible PCB this system can be implemented even on small areas of heels, sandals etc. without compromising the comfort levels.
2. Can also be implemented as safety provisions for men too such security personnel at ATM's, Banks.

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