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**“BLUETOOTH AIDED SAFETY BAND FOR WOMEN’S USING SMARTPHONE”**

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**ABSTRACT:** *In today’s world women’s are less secure, they are facing more number of situations like kidnapping, rape case, & abuse. Because of this reasons women’s can’t step out of their house. The prime question in every Woman’s mind, taking into account the ever rising increase of issues on women harassment in recent past, is only about her safety and security. The only thought haunting every Woman’s is when they will be able to move freely on the streets even in odd hours without worrying about their security. When such incident happens with women’s they will not feel insecure or helpless if they have some kind of device with them. With the help of these devices girls & women’s can stay out without any fear at any time. This system can be used at places like bus stops, railway stations, footpaths, shopping malls, markets, etc. This project focuses on Women’s Safety Gadget which is helpful for women’s. Personal safety is one of the most important concerns for women, as crime against women has not decreased. Now a days ,various devices are available in markets which claim to protect women in many ways. Still there arises the need of a protective device which acts as a guardian at time of an attack. This fuels a new thought of a Bluetooth Aided Safety ring for Women using Smartphone . This paper aims to create a wearable ring with provision of connecting with smart phone via Bluetooth. If an emergency occur, the smart phone will produce a high volume alarm and it also sends alert messages to predefined numbers with current location of the device. The main advantage of this ring is its convenience of operation and easiness.*

**Keywords:** Bluetooth, arduino, Smartphone, push button, women safety band

## **1. INTRODUCTION**

The status of women in India has been subject to many great changes over the past few millennia. In modern India, Women are treated on equal grounds with men. They have become Independent and are keeping pace with the changing trends. However, in some parts women still continue to face discrimination and other social challenges and are often victims of abuse and violent crimes. Due to these reasons it has become very important for females to stay alert and tackle all such situations efficiently when they are alone. It is high time that we equip ourselves to deal with such situations. Neither women nor their families need to worry about the time or places when they go out. All they need is a device that can be carried around easily and worn whenever the woman feels unsafe. Here we introduce a wearable device which normally works as an ordinary band. It also incorporates a Bluetooth unit that will help the victim to communicate with their family or police at the first sign of trouble. The band is intended to work as a location tracker, if necessary. This demands the need of additional hardware which results in increased size

and weight [7]. All these flaws can be rectified by using the Bluetooth technology so that the functions like tracking, messaging can be performed with the help of a smart phone on receiving the command and alert message with location will be sent to a predefined number.

In modern India, women have adorned high offices in India including that of the President, Prime Minister, Leader of the Opposition and Speaker of the Lok Sabha. However, women in India continue to face social challenges and are often victims of abuse and violent crimes and, 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 [A group of developing industrial Nations established on 20th August 2003] countries. In India, every day more than 30 women were murdered and many are suffering austere mental and physical trauma [1]. This System focuses on a security system that is designed solely to serve the purpose of providing

security to women so that they never feel helpless while facing such social challenges.

## 2. HARDWARE DEVICE

- a. Bluetooth Device HC-05
- b. Arduino nano
- c. Push Button
- d. Smart Phone

### a. Bluetooth Device

Bluetooth is a technology for wireless communication. It is designed to replace cable communication. Usually, it connects small devices like mobile phone, PDAs and TVs using short range wireless connection .and it uses 2.4 GHz frequency band. The connection can be point to point or multipoint where the maximum range is 10 meters. The transfer rate is 1 mbps

#### .HC-05 Specification

- 2.4 GHz Frequency
- Asynchronous Speed 2.1 mbps
- Power Supply : 3.3 v

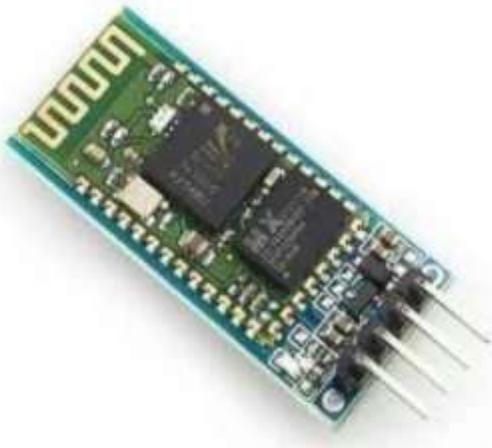
#### Description

We have six lead in this module, two are for VCC and Gnd.

VCC= power supply (5v or 3.3 v)

GND= Ground (0 v)

RXD are used to receive data from arduino. It need to be connected to the arduino serial transmit pin, that is TXD pin  
TXD is used to send data from the Bluetooth module to the arduino. It needs to be connected to the serial received pin RXD of the arduino. But in that project no need to be transmitting the data from Bluetooth to arduino.



### b. Arduino nano

The Arduino nano is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino nano 3.0) or ATmega168 (Arduino nano 2.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one. The Nano was designed and is being produced by Gravitech

**Microcontroller:** Atmel ATmega168 or ATmega328

**Operating Voltage:** 5 V

**Input Voltage (recommended):** 7-12 V

**Input Voltage (limits):** 6-20 V

**Digital I/O Pins:** 14 (of which 6 provide PWM output)

**Analog Input Pins:** 8

**DC Current per I/O Pin:** 40 mA

**Flash Memory:** KB (ATmega168) or 32 KB (ATmega328) of which 2 KB used by boot loader

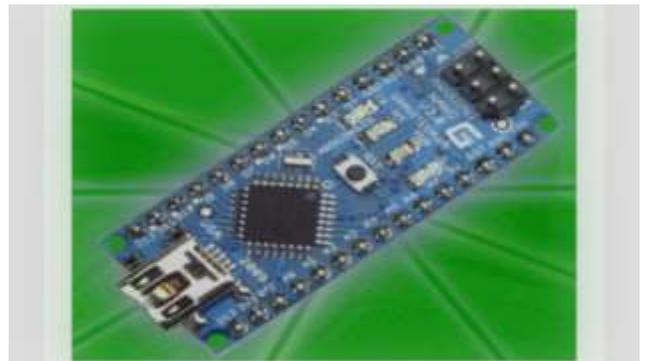
**SRAM:** 1 KB (ATmega168) or 2 KB (ATmega328)

**EEPROM:** 512 bytes (ATmega168) or 1 KB (ATmega328)

**Clock Speed:** 16 MHz

**Dimensions:** 0.73" x 1.70"

**Push Button:** Push Button is a simply Switch mechanism for controlling some process. Button is typically made out of hard material, usually plastic or metal. The surface is usually flat or shaped to accommodate the human finger or hand, so as to be easily pushed. Button is most often biased switch, although many un- biased buttons still required a spring to return to their un pushed state. Different people use different terms for the pushing of the button such as Press, Depress, Mash and Punch.



**c. Smartphone**

In smart phone consist of GPS and GSM module. GPS is used for to find the location and GSM is stand for Global system for mobile, it is wireless technology which act as mobile phone.

The smart phone in which install a Android application. The push button will be connecting the smart phone to the Bluetooth module. And received the serial data from the arduino Bluetooth module.

**3. THE CONNECTIVITY BETWEEN BLUETOOTH MODULE AND ARDUINO NANO**

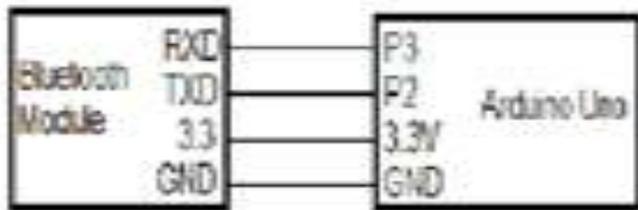


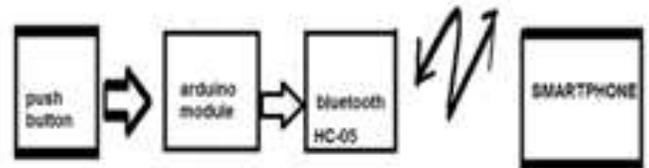
Fig: connection of Bluetooth HC-05 and arduino

- The Bluetooth module communicates with the arduino nano via a serial communication , it has four that will be using :
- VCC is used to power the module. it need to be connected to the arduino 5v pin.
- GND is the ground pin. it need to be connected the Arduino ground pin.
- TXD is used to send the data from the Bluetooth module to the arduino. It need to be connected to the serial received pin RTXD of the arduino.
- We will not be using RXD is used to receive data from the Arduino. it need to be connected to the TXD pin of the Arduino.
- STATE and KEY of Bluetooth module connected to pin
- In the Bluetooth module the TX line is rated as 3.3V. This means that even though we can power the module with 5v from the arduino, the communication lines from and to the module are supposed to be at 3.3volts.
- Sending data from the Bluetooth module via the TX of module will not be an issue, as per Arduino RX line will interpret the 3.3V signal from the Bluetooth module correctly.
- Receiving data from the Arduino is where we need to do more work. The RX line of the Arduino nano is running at 5volts, so we will be sending a higher voltage on the Bluetooth modules RX line
- Did not want to risk the burning the Bluetooth module , through the 5v supply of RX lines, for that purposed used two resistors to created a voltage

divider and drop the voltage of the Arduino TX line signal from 5v to approximately 3.3 volts.

- Used a 20k ohm and 10k ohm resistor, as long as get a V out of about 3.3volt based on the voltage divider.
- Use the positive 3.3v voltage regulator. Connect the input pin of voltage regulator to the Arduino TX line, the ground pin to the Arduino ground and the output pin of the voltage regulator to the Bluetooth HC-05 of RX line.

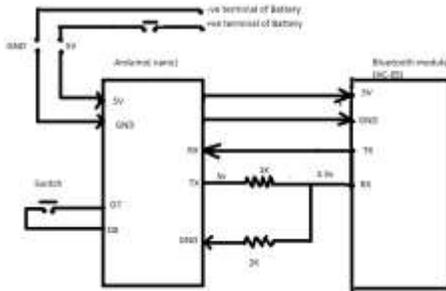
**4. WORKING**



Used by the United States Navy, was first successfully tested in 1960. Using a constellation of five satellites. A GPS receiver calculates its position by precisely timing the signals sent by the GPS satellites high above the Earth. Each satellite continually transmits messages containing the time the message was sent, precise orbital information (the ephemeris – orbit path and speed of each satellite), and the general system health, current date and time of all GPS satellites (the almanac). The receiver measures the transit time of each message and computes the distance to each satellite. A form of triangulation is used to combine these distances with the location of the satellites to determine the receiver's location. The position is displayed, perhaps with a moving map display or latitude and longitude; elevation information may be included. Many GPS units also show information such as direction and speed, calculated from position changes.

**Steps:**

- Push button is switch which is used for sending message from Smartphone via Bluetooth.
- Bluetooth is wirelessly connected to Smartphone and serially connected to Arduino module
- Arduino module is act as microcontroller
- Android app is designed in Smartphone to sending data to Bluetooth module.
- HC05 works in serial communication
- When the switch is press for 2 sec android app send data to Bluetooth
- The code fed to Arduino check the receive the data and compares



## 5. FUTURE SCOPE

1. Let the police, family and friends know that you are in danger and where you are? Declare an emergency whenever you sense danger, when you can disengage the emergency.
2. Provides necessary first aid measures that should be taken at the time of some dangerous situations.
3. Let to the police control room know your path to the destination.
4. It has become very important for females to stay alert and tackle all such situations efficiently when they are alone.
5. It is high time that we equip ourselves to deal with such daunting situations. Neither women nor their families need to worry about the time or places when they go out. All they need is a device that can be carried around easily and women whenever the woman feels unsafe.

This System focuses on a security system that is designed for to serve the purpose of providing security to women so that they never feel helpless while facing such social challenges.

### Software features

- Easy Pairing
- Android base
- GPS Tracking
- Add Emergency contacts
- Mobile alerts

### Advantages

#### 1) Women's Security

In some parts women still continue to face discrimination and other social challenges and are often victims of abuse and violent crimes. Due to these reasons it has become very important for females to stay alert and tackle all such situations.

#### 2) Bluetooth is Automatic

In this project we use Bluetooth; Bluetooth doesn't require you to think about setting up a connection or to push any buttons.

When two or more Bluetooth devices enter a range (Up to 30 feet) of one another, they automatically begin to communicate without you having to do anything. Once the communicating begins Bluetooth devices will setup Personal Area Networks.

#### 3) Low Energy Consumption

Bluetooth uses low power signals. As a result, the technology requires little energy and will therefore use less battery or electrical power. Obviously, this is a great benefit for mobile devices because Bluetooth won't drain the life of your device's battery.

- 4) It is more reliable for women security.
- 5) Its cost is moderate.
- 6) All they need is a device that can be carried around easily and women whenever the woman feels unsafe. i.e small in size.
- 7) Faster Response time from emergency agency.
- 8) Avoids the women rape.
- 9) Provides very accurate data via GPS system.

### Disadvantages

Disadvantages as follows:

1) Battery Use –This problem occurs on your cell phones. Your cell phone's battery will be rapidly decreasing rapidly when you leave your phone's Bluetooth enabled for number of hours. The best way to overcome this is disable the Bluetooth immediately after completing your task. It takes only a few seconds to enable and disable it.

2) In this project for women security we use Bluetooth based devices such as Bluetooth ring and smart phone here blue tooth range is 32.8ft so, according to that range if smart phone is moved from out of that range then disable Bluetooth connection. Due to which women security process is incomplete.

3) If we want to activate that women security app then press the switch of Bluetooth ring continuously three times . if between that process delay is occurred then that process is not success.

## 6. APPLICATION

- 1) It can be used as safeguard when the women in critical conditions.
- 2) Women can go anywhere with more secure.

3) It is also used for Primary School Children Safety: As the school children safety are major concerns for parents as well as school management due to the recent incidents of child crimes like children missing, abuse etc.

4) Wireless control of and communication between a mobile phone and a Bluetooth ring. This was one of the earliest applications to become popular.

## **7. CONCLUSION**

Women safety is a critical social issue in today's world. Through this paper we aim to put forward an efficient and handy safety device for women. The proposed design can handle some critical issues faced by women and will help to solve them with technologically sound and simple equipments. It can be concluded that this system helps to improve the gender equality by providing safe environment to women in the society, and allows them to work till late nights. The band helps to get necessary help in any distress and facilitate a means of self defence. Anyone before doing any crime against the women will be detected and it help reducing the crime rate against the women. The proposed design will deal with critical issues faced by women in the near past and will help them with technology and ideas. In this way, This system can overcome the fear that scares every woman in the country about her safety and security.

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