DESIGN OF ANTI EVE TEASING SAFETY SYSTEM

Dissertation submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF TECHNOLOGY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

BY

ABHINAV PANDEY (141006)

SHIVANGI SUD (141015)

ABHINAVA (141018)

UNDER THE SUPERVISION OF

DR. RAJIV KUMAR

to

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY

May, 2018

TABLE OF CONTENTS

Contents……..page

DECLARATION BY THE STUDENTS

We hereby declare that the work reported in the B.Tech. thesis entitled "**DESIGN OF ANTI EVETEASING SAFETY SYSTEM"** submitted at **Jaypee University of Information Technology**, Waknaghat India, is an authentic record of my work carriedout under the supervision of DR. RAJIV KUMAR. We have not submitted this work elsewhere for any other degree or diploma.

ABHINAV PANDEY : _____

ASHIVANGI SUD: _____

ABHINAVA: _____

Department of Electronics and Communication

Engineering Jaypee University of Information Technology,

Waknaghat May, 2018

SUPERVISOR'S CERTIFICATE

This is to verify that the work reported in the B.Tech. thesis entitled "**DESIGN OF ANTI EVE TEASING SAFETY SYSTEM"** submitted by **Abhinav Pandey (141006), Shivangi Sud (141015), Abhinava (141018)** at **Jaypee University of Information Technology, Waknaghat,India** is a bonafide record of their original workcarried out under my supervision.This work has not been submitted elsewhere for any other degree.

Dr. Rajiv Kumar

(Associate Professor)

Department of Electronics and Communication Engineering.

Jaypee University of Information Technology, Waknaghat

May, 2018

ACKNOWLEDGEMENT

We are very grateful and highly acknowledge the continuous encouragement invaluable supervision timely suggestions and inspired guidance offered by our guide Dr. Rajiv Kumar, Department of Electronics and Communication Engineering, Jaypee University of Information Technology, Waknaghat in bringing this report to a successful completion.

We are grateful to Dr. Samir Dev Gupta, Head of the Department of Electronics and Communication Engineering, for permitting us to make the use of the facilities available in the department to carry out the project successfully.

At the last we express our sincere thanks to all of our teachers and friends who have patiently extended all sorts of help for accomplishing this undertaking.

DATE: _____

ABHINAV PANDEY : 141006
SHIVANGI SUD : 141015
ABHINAVA : 141018

LIST OF FIGURES

ABBREVIATIONS

DTE	Data terminal equipment
EEROM	Electrically Erasable Programmable Read-Only Memory
ISP	In-system programming
GPS	Global Positioning System
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communication
RISC	Reduced Instruction Set Computer
RFI	Radio Frequncy Identification
SIM	Subscriber Identity Module
SMS	Short Message Service
EEPROM	Electrically erasable programmable memory
TDMA	Time division multiple access
FDMA	Frequency division multiple access
CISC	Complex instruction set computer
UART	Universal asynchronous receiver transreceiver
ISR	Interrupt service routine
IMSI	International mobile subscriber identity module
USB	Universal serial bus
LED	Light emitting diode
TTL	Transistor transistor logic

CHAPTER 1

INTRODUCTION

1.1 EXISTING SYSTEM

In this day and age, women's security has turned into a noteworthy issue as they can't venture out of their home at any given time because of physical and sexual mishandle and a dread of brutality. Indeed, even in the 21st century where the innovation is quickly developing and new devices were produced yet at the same time ladies and young ladies are confronting issues. Indeed, even today in India, women can't move during the evening in detached places and even at day time swarmed places a large number of occurrences of physical and sexual manhandle happens each day women in this nation. Among different wrongdoings, assault is the quickest developing wrongdoing in the nation today. In this the we have actualized ladies security framework on atmegA328 microcontroller by means of GSM modem.

Keeping identical concern in mind several developers have come back up with innovative applications. Few of such applications area unit as follows-

1. VithU app: This is associate degree emergency app initiated by a well-liked Indian criminal offence tv series "Gumrah" airy on Channel [V]. during this app once the ability button of the Smartphone is ironed double consecutively, it'll begin causation out alert material with a link to the emplacement of the user each 2 proceedings to the contacts FRS into the app. FRS into the app.

2. SHE (Society Harnessing Equipment): It is a garment designed by 3 engineers from Chennai . This garment has an electrical circle that may generate 3800kv of current which may facilitate the victim to flight . just in case of multiple fireplace it will send upto eighty two electrical shocks . Since the material is bilayer , the user isn't affected. It can even emergency messages.

3. ILA security: The co-founders of this technique , MHz Givern, James Phillips and Neil Munn , have designed 3 personal alarms that may shock and bedevil voltage attackers and draw attention to dangerous billet .

1.2 Block diagram

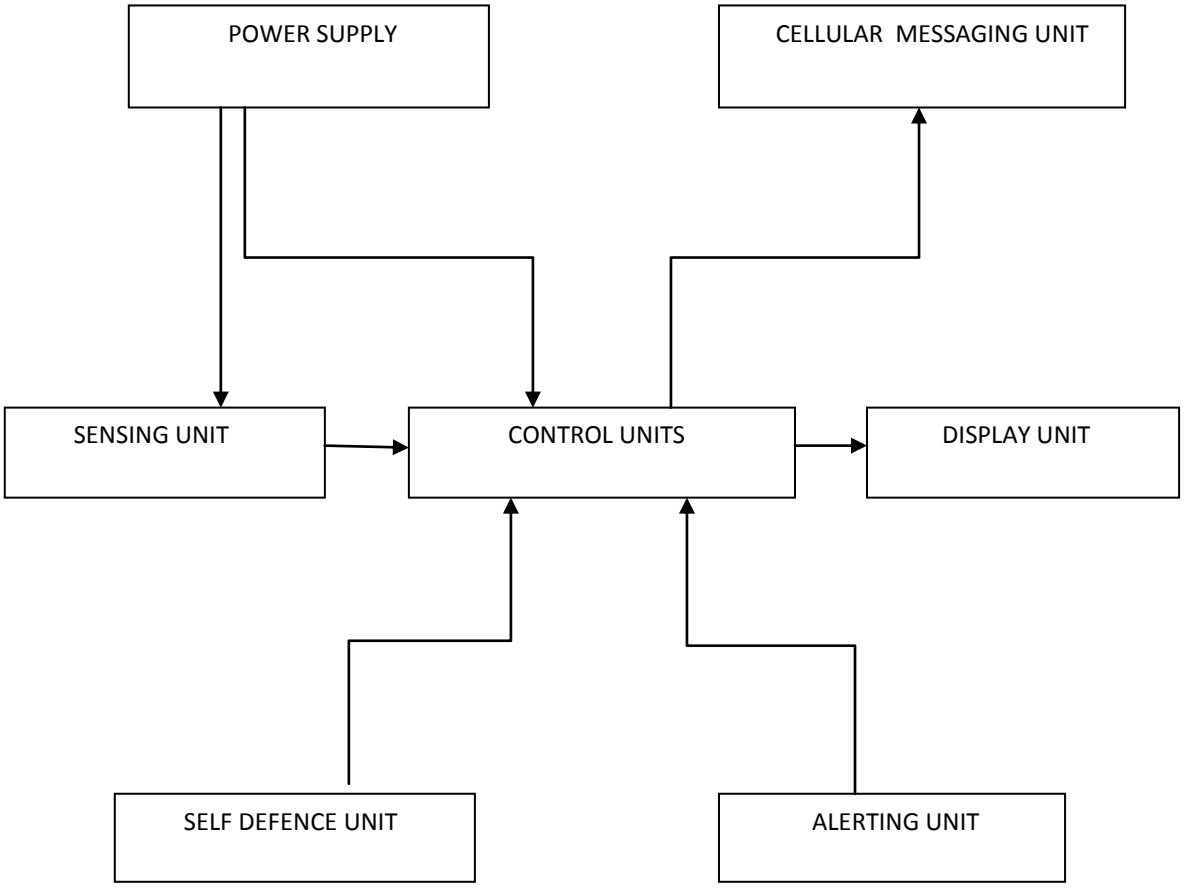


Fig. 1.1 block diagram

1.3 Flow chart

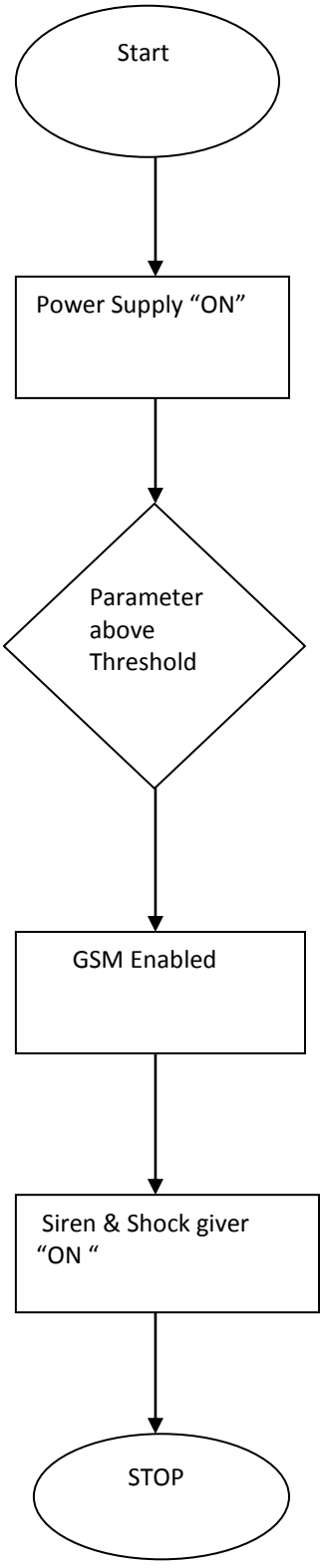


Fig. 1.2 flow chart

1.4 Requirements

Hardware requirements:

1. Microcontroller ATMEGA328
2. GSM Module(SIM900A)
3. Ultrasonic Range Finder
4. Panic switch
5. Vibration motor
6. Transistor as Driver
7. Relay switch
8. Buzzer
9. Power Supply
10. Shock Switch
11. Current Generating Probe

Software requirements.:

1. Programming in Arduino C
2. Arduino Software

CHAPTER 2

LITERATURE REVIEW

1. **Design and Development of "Suraksha"-A Women Safety Device by Nishant Bhardwaj1 and Nitish Aggarwal**

   The gadget, named as "Suraksha" is a security framework uniquely intended for women in trouble. It is a straightforward and simple to convey gadget with unselfish functionality.The essential approach is to scare moment area and a trouble message to the cops and enlisted number, so appalling episodes would be deflected and to give immediate confirmation for a quick activity against the culprits of wrongdoing against women. Currently the work is under procedure to scale down it so it could be installed in jewelleries, cell phones and so forth consideration in mind the end goal to make it an adaptable instrument for masses. It can assume a noteworthy part in the forthcoming ventures, for example, CCTNS (wrongdoing and criminal following system and framework) in which all the police records all finished India are digitized and all the police headquarters all through the nation will be coordinated.

2. **On touch alarm system for women's safety using GSM by PremKumar.P, Cibbichakkarvarthi**

   This acknowledges guarantee and approach assets to modify the one to out of unsafe circumstance. Whenever you detects risk, you must merely, suspend on the catch of the contraption. The contraption includes of a GSM module, microcontroller and GPS modules. The framework appears like a standard watch that once enacted, the place of the ladies is trailed utilizing GPS (Global Positioning System) and sends crisis notification utilizing GSM (Global System for Mobile correspondence), to the room of police authorities and sos contacts.

3. **Application for Women Safety by 1S.Sangeetha, 2P.Radhika PG Scholar, Department of MCA, Panimalar Engineering College**

This task shows a ready framework for Women wellbeing discovery utilizing basic financially accessible electronic gadgets to both identify the issue and ready experts. An Android based advanced cell is utilized with a coordinated highlights that alarm and give area based data to caution experts. Information from the application is assessed with a few edge based AES calculations and position information to decide an issue. The framework gives a feasible, savvy answer for issue discovery utilizing a straightforward graphical interface while not overpowering the client with awkward sensors. Issue is capable programming particularly created for the wellbeing of young ladies, at whatever point some body is stuck in an unfortunate situation they don't need to sit and discover contacts or discover approaches to send short message administration, or message the close to ones. They won't not have so much time.. All that they need to do is shake the advanced mobile phone over the edge esteem, overwhelmingly. Quickly a message alarm is sent to the individual's mother, father and whoever they wish to, if their gatekeepers additionally have an advanced cell. Despite the fact that in the event that it is in quiet mode. At the point when a message called caution is gotten it naturally changes its profile to general, and gives a message notice YOUR DAUGHTER IS IN TROUBLE PLZ HELP… . PLZ

HELP… . PLZ HELP… . Over and over message until the point when itis seen and stop it.. Presently a day security of women is winding up extremely poor and the requirement for this sort of utilization is consistently expanding work shrewd, additionally anticipating build up a standard timetable based component to screen the ladies' security utilizing GPS (Global Positioning System), GPRS (General Packet Radio Service), and so on.…

4. **Self defense system for women safety with location tracking and SMS alert by B. Vijyalakshi, Renuka**

Assault is that the fastest developing wrong doing within the nation nowadays. The convenience delineate here may be a self preservation framework

exceptionally supposed for girls in bother to help them to secure themselves. This convenience is adjusted in a very tote, belt or adjusted to the girl’s shoes and also the mania catch connected to the belt. the girl in peril will initiate the framework by squeeze crisis catch on belt or tilting her shoes. it's an easy and straightforward to convey convenience with intensive form of highlights and quality.

CHAPTER 3

HARDWARE DESCRIPTION

In this project we utilized ATMEGA328 microcontroller. It basically controls the all elements of the venture. GSM modem is utilized to send messages to the predefined numbers put away in the microcontroller.

3.1 ATMega328 Controller:

The favourable operating Atmel 8-fleck Reduced instruction set laptop -based microcontroller incorporate 32KB ISP fanfare memory with read-while-write capacities, EEPROM of single K ,SRAM of 2KB , twenty three common purpose I/O line , thirty two general social event operating registers, 3 supple timekeeper or replication with comparison mode , in and out interrupt , serial programmable USART, a computer memory unit -predilection 2-wire serial interface, SPI interface, with a 10-bit A/D device 10-bit A/D device (8-channels in TQFP and QFN/MLF package), programmable watchdog timer with an enclosed generator, and 5 code elect top executive saving modes. The device operates between the vary of one.8-5 .5 volts. By effective powerful direction in single clock cycle, the device attains output that approaches one million instructions per second per megahertz, balance the power consumption and therefore the process speed

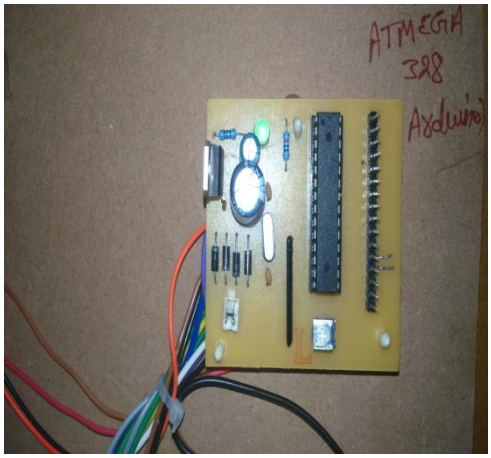


Fig 3.1 ATMega 328 microcontroller

3.2 GSM (Global System for Mobile Communication)

GSM contract for Global System for Mobile Communications . It is an affirmed circle by the European Telecom Banner Institute (ETSI) to indicate convention to the second era (2G) advanced cell systems utilized by phones. A Modem is an instrument which regulates and demodulates movement as compulsory to meet the correspondence concerns. It helps in tweaking a simple pallbearer pin to encode computerized substance , and furthermore encourages in demodulating such a transporter flag to unravel the transmitted message. A GSM Modem is a mechanical meeting place that regulates and GSM signals are modulated . The modem SIM300 is a Tri-band GSM/GPRS Modem since it can find and piece of work at three frequency that are EGSM 900 Megahertz ,DCS 1800 Mega Hertz and PCS1900 Mega hertz. EGSM 900MHz and DCS 1800MHz are the default working frequencies. Sim300 is widely utilized as a percentage of numerous undertaking and consequently numerous variations of improvement sheets for this have been progressed. These progressions sheets are showed with different highlights to make it available to speak with the SIM300 module. A few sheets prepare just TTL user user interface where as a few sheets incorporate a RS232 interface and some others fuse a USB interface. GSM module pre possess here, subsists of a TTL interface and a RS232 interface. The TTL interface enables us to exactly interface with a microcontroller in spite of the fact that the RS232 interface fuse MAX232 IC to set up correspondence with the PC. It additionally comprises of a bell, recieving wire and SIM

Fig 3.2 GSM modem

3.2.1 SIM card

A SIM bill , likewise perceived as a subscriber identity module, may be a discernment card that stores data for GSM cell phonephone endorsers. Such information comprises of customer character, area and phone act , organize specialist information, individual security keys, striking records and put option away trice messages. Protection feature incorporates validation and encryption to shield information and preclude listening in. A SIM card can be ported effectively starting with one cell bent then onto the next. The conveyability of information offers a Bunche of help. For example, a client that steal another phone can introduce the electric current SIM card to accessory the new phone with a similar number and client wants the old one. In another pervasive condition , if a telephone's battery comes up short on control, the client can easily introduce the card to an alternate endorser's telephone to gain it without running up that client's minutes. A few merchant offer paid ahead of time SIM cards that are hand over to the visitor with nearby figure , considering , their mobile phones are not bolted to a particular transporte

Functions of the SIM card

The SIM card implements the given important functions:

1) **Subscriber's identification**: The IMSI modified on the SIM card , is the identitification of a supporter. Each IMSI is profiled to a portable bit and direct on the HLR to enable a supporter of be recognized.

2) **Subscriber's Authentication**: In this technique , utilizing the commendation calculation (COMP1II 8V3 for 2/2.5 G GSM, Cave for CDMA and Milenage for 3G) on the SIM board , AN exceptional reaction is contributed by each endorser seeable of IMSI, ki (put away on SIM) and RAND (gave by mesh). By coordinating this response with values patterned on the organisation , a legimitate subscriber is logged on to the system and he or she would currently be ready to build utilization of the assistance of the versatile specialist of service supplier of Mobile.

3) **Storage**: In storing phone numbers and text messages.
4) **Applications: :** The SIM Tool Outfit or GSM eleven .14 criterion acknowledge making applications on the SIM to allow pinion info on demand and furthur applications like m-commerce, chatting, cell broadcast, telephone book duplication , location based mostly services etc

.

3.2.2 SMS (Short Message Service)

Introduction

Short message welfare may be a system of conveyance of short substance over the convenient frameworks. it's a store and forward technique for causing and tolerating substance to and from Mobile . The message simply from the causing compact is saved in an exceedingly premier short message pith (SM) that by then what is more move it to the aim versatile. This construes for the context that the semantic role is not accesible, the short message is secured and might be sent when some sentence . every short message cannot be quite one hundred sixty characters. These characters may be content (alphanumeric) or twofold Non-Text Short substance . A attractive parting of Sm is come receipts. this implies the sender, will get somewhat message illuminating if the short message was passed on to the planned recipient on his wish. Since metal used hailing TV channel as against gave TV channel , these messages may be sent and got meantime with the voice or knowledge or fax advantage over a GSM creator . number sixty two bolsters national and every one comprehensive wandering. This infers you'll be able to send short messages to another GSM versatile client in and round the world. With the personal computer frameworks that depends upon all the 3 developments to be explicit GSM, CDMA and TDMA supporting SMS, SMS is much Associate in Nursing overall convenient knowledge valuable .

Working of SMS

The figure underneath portrays a regular association of system components in a GSM arrange supporting SMS

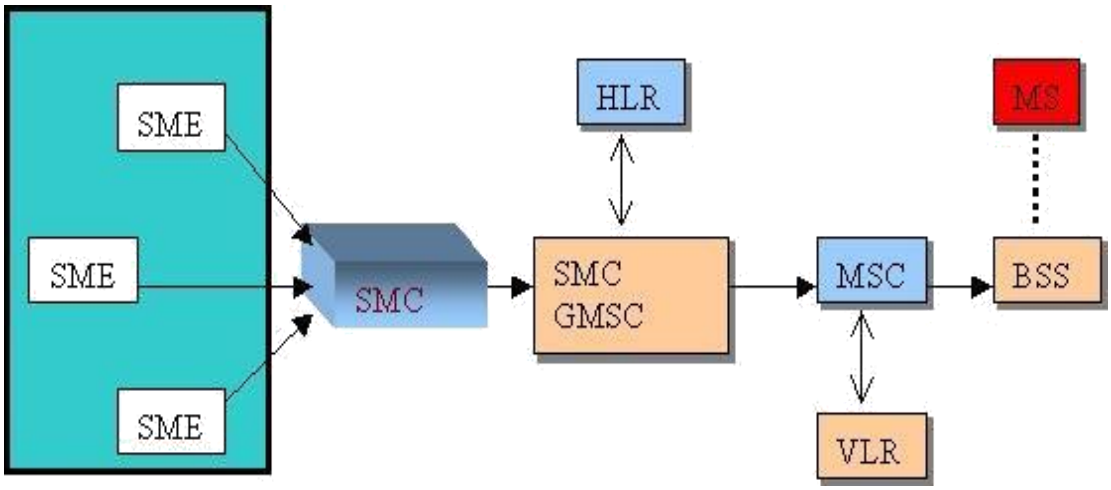


Fig. 3.3 Functioning of SMS

The SMC (Short Message Center) is that the service that do the project of putt away and causing of subject material s to and from the versatile post . The SME (Short Message Entity) may be centered within the settled organization or a flexible station , gets and sends short substance s. The Master of Science GWMS (Samarium threshold MS) could be a section SM that to a fault secure short message . The portal MS could be a State Department of contact of versatile system 's with totally different theme . On acceptive the short message from the short message focus, GMSC utilizes the SS7 system to look at the park expanse of the transportable station from the HLR that remains for the house space enlist. HLR is that the focal data base during a transportable system. It controller directions of the membership profile of the transportable and moreover concerning the steering guideline of the subscriber, that's the territory that is secured by a MS wherever the versatile is presently organized. The GMSC is during this vogue able to pass away the message to the proper MS. MS (Mobile switch Center) is that the part during a GSM organize that is accountable of the endeavor of exchanging tie-up between transportable place or versatile

station and also the settled system. A VLR (Visitor Position Register) compares to each MS and contains impermanent data concerning the versatile, information like

transportable recognizable proof and also the mobile phone (or a gather of electrical cell) wherever the transportable is true currently organized. Utilizing information form the VLR the MS will controller the info (short message) to the relating BSS (Base Station System, BSC + BTSs), that transmits the short message to the transportable. The BSS contains of handsets, that send and obtain information over the air interface, to and from the versatile station. This information is slighted the hailing channels so the convenient can get messages paying little respect to whether an agent or data is going on.

3.3 Ultrasonic range finder

C SR04 is associate degree inaudible vary finding module with associate degree accuracy of zero.3cm. The sensing vary of this module is from 2cm to five meter. operating current of this detector is fifteen mA and also the mensuration Angle is 15°. HC-SR04 has four identification number s. Their half-dozen senses of name and procedure area unit explained below.
Vcc: 5V activity potential is given to the current pin.

Trigger: A 10uS long pulsation is given to the current pin for initiation ing the transmission. Upon receiving a sound trigger pulse, the HR-SR04 problems eight 40KHz pulses. Time taken by these pulses to replicate back is measured and also the aloofness is calculated from it.

Echo: At this oarlock tumbler the HC-SR04 outputs a signal whose time is proportional to the vary.

Ground : Ground is connected to the current pin.

The following diagrams summarize the excellence between proximity and move inaudible detector

3.3.1 Two types of Ultrasonic sensors

Proximity detection

An object passing anyplace at intervals the planned vary are going to be detected ANd generate an yield signal. The find spot is freelance of target size, material , or grade of constant of reflection .

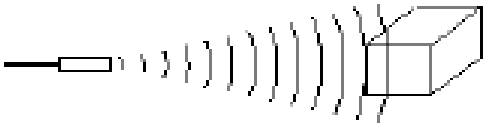


Fig. 3.4 Object detected

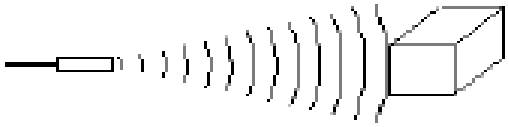


fig 3.5 object not detected

Ranging detection

Precise distance(s) of AN object moving to and from the detector ar measured via time quantity between transmitted and mirrored bursts of unhearable sound. the instance shows a object detected at six in. from sensing element and moving to ten inches. the space modification is ceaselessly calculated and outputted.

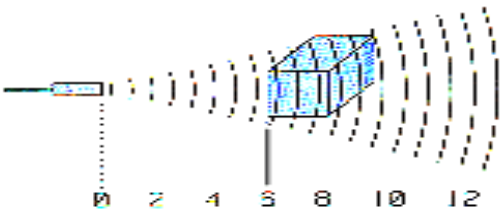


Fig 3.6 target at 6 inches

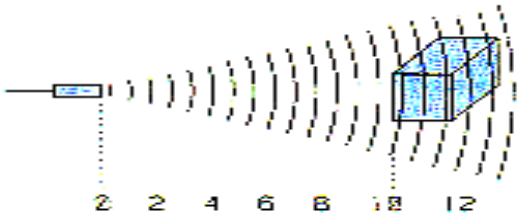


Fig 3.7 target at 10 inches

3.4 Relay switch

Hand-off is AN magnetic force gadget that is employed to disengage 2 circle s electrically and associate them beautifully. they're extraordinarily useful gadgets and change one circuit to shift another whereas they're altogether isolated. they're frequently wont to interface AN electronic circuit (workings at a coffee electrical phenomenon) to AN electric circuit that works at high electrical phenomenon . for example, a help -off will create a 5V DC battery circuit to shift a 230V AC main circuit. during this approach somewhat detector circuit will ride , say, a rooter or an electrical globe . A hand-off switch are often separated into 2 sections: information and payoff . the data

space encompasses a loop that creates engaging field once somewhat electrical phenomenon from AN electronic circuit is connected to that. This voltage is understood because the operating voltage. usually used transportation s area unit accessible in varied set up of operating voltages like 6V, 9V, 12V, 24V so on. the assembly section contains of liaison ors that interface or detach automatically. in a very first harmonic transference there area unit 3 contactors: generally open (NO), frequently shut (North Carolina) and traditional (COM). At no data categorical, the COM is related to Old North State. At the stop once the operating voltage is connected the transfer roll gets rested and therefore the COM changes contact to NO. numerous transfer arrangements area unit accessible like SPST, SPDT, DPDT so on, that have distinctive issue of transition contacts. By utilizing legitimate mix of contactors, the electric circuit are often turned on and off

Fig.3.8 Relay switch

3.5 Arduino UNO

The Arduino Uno could be a microcontroller board supported the ATmega328 (datasheet). it's fourteen digital stimulation /output peg (of that digit will be used as PWM outputs), vi analog inputs, a sixteen megacycle per second quartz oscillator, a USB association, an influence jack, associate ICSP header, and a push. It contains everything required to reinforcement the microcontroller; merely connect it to a knowledge processor with a USB linear unit or power it with a Alternating current -to-D.C. adapter or battery to induce started.

Fig 3.9 Arduino uno

3.5.1 Technical specifications

Microcontroller	ATmega 328 P -8 bit AVR family microcontroller
Operating Voltage	5V
Recommended Input Voltage	7-12V
Input Voltage Limits	6-20V
Analog Input Pins	6 (A0 – A5)
Digital I/O Pins	14 (Out of which 6 provide PWM output)
DC Current on I/O Pins	40 mA
DC Current on 3.3V Pin	50 mA
Flash Memory	32 KB (0.5 KB is used for Bootloader)
SRAM	2 KB
EEPROM	1 KB
Frequency (Clock Speed)	16 MHz

3.6 Piezo buzzer

The piezo signal green goods strait in view of transposition of the piezoelectric car impact. The eld of weight variety or strain by the use of electric potential over a piezoelectric material is the basic standard. These Melville Bell can be utilized caution a client of an occasion relating to an exchanging activity, counter flag or detector input. They are likewise utilized as a component part of alert circumference . The signal delivers a same boisterous sound free-lance of the voltage variety connected to it. It comprises of piezo precious stones between two music director s. At the tip when a potential is connected over these gems, they pushing on one conductor and draw poker on the other. This, push and draw activity, brings about a sound wave. Most sign create sound in the scope of 2 to quaternity kilohertz . The Red lead is associated with the Input and the Negroid lead is associated with Terra firma

.

3.7 Alerting unit

A simple, but powerful and effective way to raise an alarm is through a loud siren and bright lights. And this is achieved with the help of a bright LED flash light and an electronic siren. Thus, when the women safety device senses the emergency situation of a woman, it triggers its alerting unit which alerts the nearby people about the crime by loud noises and bright flashes of lights.

3.8 Self defence alert

A basic, however capable and compelling approach to raise an alert is through a boisterous siren and splendid lights. What's more, this is accomplished with the assistance of a brilliant LED streak light and an electronic siren. In this way, when the ladies security gadget detects the crisis circumstance of a lady, it triggers its cautioning unit which alarms the adjacent individuals about the wrongdoing by noisy commotions and splendid flashes of lights.

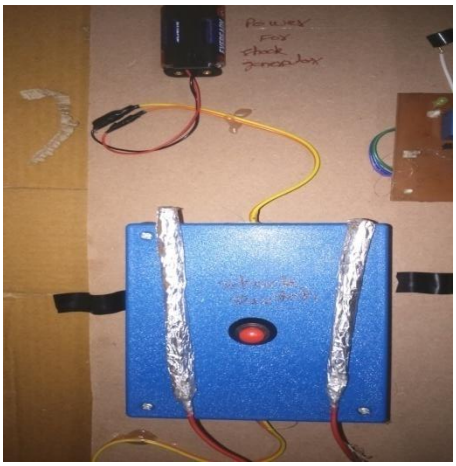


Fig. 3.10 alert unit

CHAPTER 4

COMPARISON OF USED TECHNOLOGY OVER OTHER

4.1 Why use AVR microcontrollers over other:

i. Reduced Instruction Seth Computers (RISCs) provide a lot of performance per semiconductor than typical advanced Instruction Set Computers (Complex instruction set computing).

ii. The architecture approach permits thirty two bite process power to be offered at abundant lower price than was potential with a CISC, owing to the smaller die filler needed to implement the processor. the supply of this power permits system practicality to be affected from hardware to computer code , that successively simplifies the support check and any reduces system price.

iii. architecture processors take associated fast|a set} variety of cycles to execute an instruction. Their directions also are mounted size.

iv. AVR has wind lined processors leading to quicker effecting (unity IPC compared to 1/12 IPC of eight 051) eight051 has 8 Eight bit written record and has four banks , just one of that is usable at any time

v. AVR have thirty two Eight bit Registers so higher than 8051 family. AVR has GCC compilers and lots of open code support. Arduino et al have build AVR somewhat a lot of approachable.

The table mentioned compares the architecture of various families

	8051	AVR	PIC	MSP430
Buus Width	8 bit for standard core	8/32 bit	8/16/32 bit	16 bit
Communication Protocols	UART,USART,SPI,12C	UART,USART,SPI,12C (Special purpose AVR supprt CAN,USB,Ethernet	PCI,Uart,USART, LIN,CAN,Ethernet,SPI	UART, USART, LIN, 12C, SPI
Speed	12 Clock/instruction cycle	1 clock/instruction cycle	4 clock/instruction cycle	6 clock/instruction cycle
Memory	ROM,SRAM,FLASH	Flash SRAM,EEPROM	SRAM Flash	SRAM Flash
ISA	CISC	RISC	Some feature of RISC	Some feature of RISC
Memory Architecture	Von Neumann architecture	Modified Harvard	Harvard architecture	Von Neumann architecture
Power Consumption	Average	Low	Low	Ultra Low
Families	8051 variants	ATMega,Xmega special purpose AVR	PIC16,PIC17,PIC18,PIC24, PIC32	MSP430X, MSP430XIXX-MSP430X0XX
Community	Vast	Very Good	Very Good	Average
Cost	Very Low	Average	Average	Average
Other Feature	Known for its standard	Cheap, effective	Cheap	Known for ultra low power operation

Table 4.1 Comparison of architecture of various microcontroller families

4.2 Why use a GSM Modem?

GSM Technology has expanded so much, that really there isn't a place on globe where there is no GSM signal. In such a circumstance GSM gives us a wide degree in controlling things remotely from wherever with just our fingertips. GSM moreover offers straightforwardness to easily confer in an all the more effective way. There are various features related with GSM development due to which it is bar far the most driving convenient correspondence advancement on the planet today. GSM advancement empowers with quick joined data, voice data, fax, mail, voice male and generally used SMS feature. GSM in like manner guarantee that all the correspondence made between frameworks are secured and protected from intruders and tricks. We have used SIM900A GSM in this venture.

Features of GSM modem:-

- Upgraded range productivity
- International meandering
- Compatibility with integrated administrations computerized organize (ISDN)
- Support for new administrations.
- SIM phonebook administration
- Fixed dialing number (FDN)
- Real time clock with caution administration
- High-quality discourse
- Uses encryption to make telephone calls more secure

- Short message service (SMS)

Applications

- SMS based Remote Control and Alerts Security Applications
- Sensor Monitoring
- GPRS Mode Remote Data Logging GSM controlled gadgets

CHAPTER 5

INTERFACING OF ULTRASONIC SENSOR WITH ATMega328

5.1 Introduction

Ultrasonic device "HC-SR04 provides a yield hail in regard to evacuate in light-weight of the echo. The device here produces a sound vibration in inaudible place the wake of giving a trigger, then it sits tight for the sound vibration to come. Directly in light-weight of the parameters, sound speed (220m/s) and time taken for the reverberate to accomplish the supply, it provides yield ram down regard to isolated.

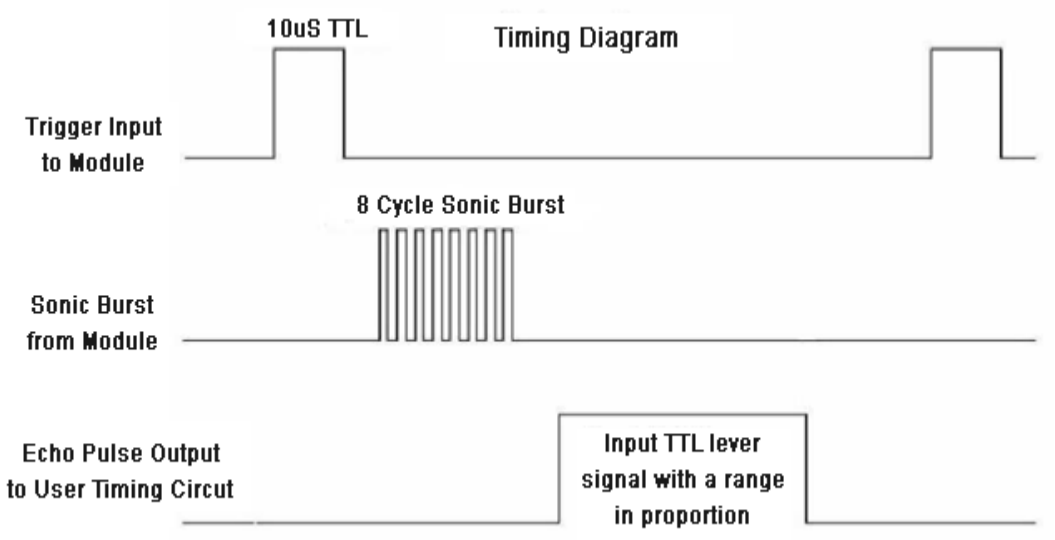


Fig 5.1 Timing diagram of HC-SR04

As appeared in figure5.1, initially it's needed to begin the device for estimating separation, that could be a HIGH explanation motion at trigger stick for over 10uS of device, once that a sound vibration is shipped by device, at that time a reverberate. At last, the device delivers a flag at the yield stick whose breadth is relative to separation and obstruction and supply.

This separation is compute as, remove (in cm) = width of heartbeat yield (in uS)/58.

The width of the flag must be taken in different of uS(micro second or 10^-6)

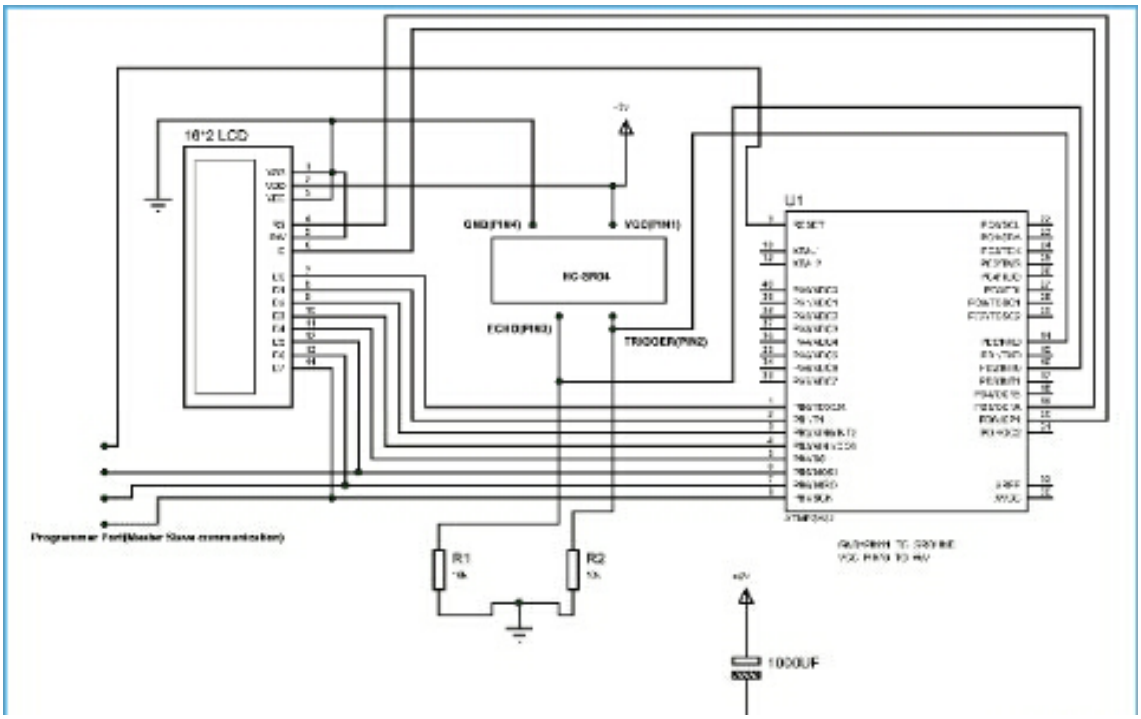


Fig 5.2 circuit diagram of HC-SR04

5.2 Program the controller to obtain the distance for the following:

1. Trigger of the sensor by pulling the trigger pin up for atleast 12uS.

2. External interrupt is obtained once echo will increase and that we area unit about to begin a counter that allows a counter within the Interrupt subroutine that is dead right once interrupt is triggered.An interrupt is generated as echo decreases again. This time we are going to disable the counter i.e stopping the counter .

3. We have initiated a counter and stopped it for a pulse high to low at echo pin. This count is updated to memory for getting the distance, since we have the width of echo in count now.
4. To get the distance in cm, We are going to do further calculations in the memory

5. 16x2 LCD display is used to display.

5.3 Setting of the following registers:

MCU Control Register – MCUCR

The MCU Control Register contains control bits for interrupt sense control and general MCU functions.

Bit	7	6	5	4	3	2	1	0	
	SE	SM2	SM1	SM0	ISC11	ISC10	ISC01	ISC00	MCUCR
Read/Write	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	
Initial Value	0	0	0	0	0	0	0	0	

Fig 5.3 control register

General Interrupt Control Register – GICR

Bit	7	6	5	4	3	2	1	0	
	INT1	INT0	INT2	–	–	–	IVSEL	IVCE	GICR
Read/Write	R/W	R/W	R/W	R	R	R	R/W	R/W	
Initial Value	0	0	0	0	0	0	0	0	

Fig 5.4 general interrupt

Timer/Counter1 Control Register B – TCCR1B

Bit	7	6	5	4	3	2	1	0	
	ICNC1	ICES1	–	WGM13	WGM12	CS12	CS11	CS10	TCCR1B
Read/Write	R/W	R/W	R	R/W	R/W	R/W	R/W	R/W	
Initial Value	0	0	0	0	0	0	0	0	

Fig 5.5 timer

The three registers are set by the setup for working .

BLUE (INT0): This bit must be set high to empower the outside interrupt0,as soon as this pin is set we will get the chance to detect the rationale changes at the PIN D2.

Darker (ISC00, ISC01): These two bits are balanced for the proper logical change at PD2, which is considered as intreupt.

Interrupt 0 Sense Control

ISC01	ISC00	Description
0	0	The low level of INT0 generates an interrupt request.
0	1	Any logical change on INT0 generates an interrupt request.
1	0	The falling edge of INT0 generates an interrupt request.
1	1	The rising edge of INT0 generates an interrupt request.

Table 5.1 sense control

So as earlier we have a tendency to need a ruin to begin a count and to prevent it. thus set ISC00 collectively and that we get associate degree impede once there's a justification LOW to HIGH at INT0 ; another impede once there's a basis HIGH to LOW.

RED(CS10): This bit is just to change and to disable counter. withal the manner that it works close extraordinary bits CS10, CS12. we have a tendency to aren't doing any prescaling here, thus we have a tendency to need not worry over them.

5.4 Steps of interfacing

Step 1 - wiring components as

VCC-5V on arduino

GND-GND on arduino

ECHO-PIN 10 on arduino

TRIG -PIN 9 on arduino

Step 2 – coding on arduino IDE

Step 3 – working

The sensor delivers a ultrasound of 40,000hz and goes in air when it hits an obstacle it is recognized by the authority and time taken can't avoid being taken as the base for discovering the division .

The HC-SR04 Ultrasonic Module has 4 pins, Ground, VCC, Trig and Echo. The Ground and the VCC pins of the module should be connected with the Ground and the 5 volts sticks on the Arduino Board autonomously and the trig and resonate pins to any Digital I/O stick on the Arduino Board. Recalling the genuine goal to influence the ultrasound you to need to set the Trig on a High State for 10 µs. That will pass on a 8 cycle sonic burst which will go at the speed sound and it will be gotten in the Echo stick. The Echo stick will yield the time in microseconds the sound wave voyaged. For case, if the request is 10 cm far from the sensor, and the speed of the sound is 340 m/s or 0.034 cm/µs the sound wave should go around 294 u seconds. In any case, what you will get from the Echo stick will be twofold that number in light of the fact that the sound wave needs to advancement forward and go in reverse. So with a specific extreme goal to get the separation in cm we have to manufacture the development time an inspiration from the resound stick by 0.

CHAPTER 6

GSM INTERFACING WITH ATmega 328

6.1 Introduction

GSM is utilized for correspondence and also for call administration in the field of broadcast communications. It is utilized as a remote correspondence which is pertinent for portable correspondence, in DATA Card for remote web association. Diverse sorts of rates of GSM is separated as 1G, 2G, 3G ,4G and 5G. Because of its TDMA and FDMA get to, a lot of information can be exchanged with the assistance of GSM. GSM Technique is furthur utilized as a security framework in a specific territory which gives a ready SMS when any unsecured occurence happen, for example, issues in rush hour gridlock security, alert frameworks and so forth which furthur implies in which gives a caution, when any condition is combined.

Fig.6.1 GSM SIM900A

GSM/GPRS MODEM TTL is made with a dual band GSM/GPRS engine SIM900A which operates on 900/ 1800 MHZ frequencies. It is apt for Short messaging services, Mobile2Device interface, Device2Mobile interface and , Voice as well as DATA transfer application in Mobile2Mobile interface. The Baud rate is configured from 9600-115200 through AT command. .

GSM (Global System for Mobile Communication) technology allows user interaction with others across mobile networks therefore it offers a vast area of coverage. Interfacing GSM technology with microcontroller will faciliate it to prolong the communication to cover large area. Interfacing of GSM modem with ATmega Microcontroller

Testing of AVR board with GSM modem
Designing of AVR Atmega Board
Sending of text message using AVR Board

6.2 GSM network architecture

GSM is utilized for correspondence and also for call administration in the field of media communications. It is utilized as a remote correspondence which is important for versatile correspondence, in DATA Card for remote web association. Diverse kinds of velocities of GSM is isolated as 1G, 2G, 3G ,4G and 5G. Because of its TDMA and FDMA get to, a lot of information can be exchanged with the assistance of GSM. GSM Technique is furthur utilized as a security framework in a specific region which gives a ready SMS when any unsecured occurence happen, for example, issues in rush hour gridlock security, alert frameworks and so on which furthur implies in which gives a caution, when any condition is matched.
GSM organize engineering can be gathered into four fundamental zones as spoke to in the GSM particulars :

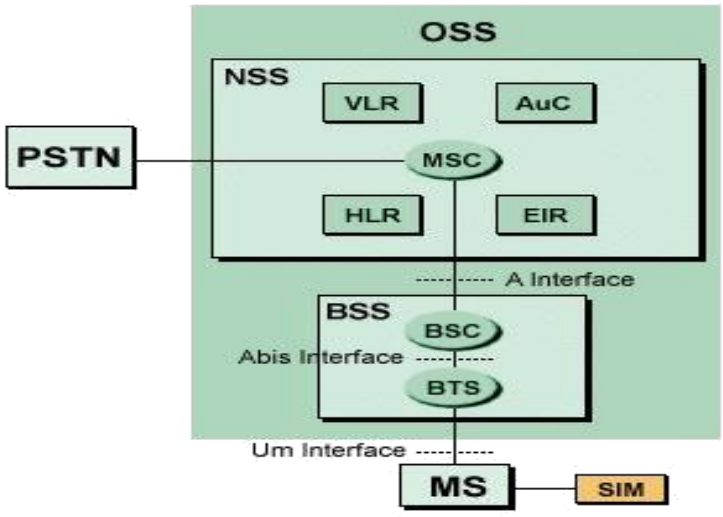


Fig 6.2 GSM system architecture

Mobile station:

Known as Mobile stations (MS), mobile equipment (ME) or all around natural terminolgy, cell or cell phones are the piece of a GSM cell arrange that the client perceives and works. As of late their size has lessened significantly where as the level of usefulness has enormously raised. A further advantage is that the time between charges has thus expanded.

There are various components in the PDA, while the two primary components are fundamental equipment and the SIM.

The instrumentation accomodates the principle components of the telephone aboard the show, battery, case, and hardware utilised as a vicinity older of the flag, and method the data to be gotten what is more, to be transmitted at an equivalent time. It in addition incorporates variety wellknown because the International Mobile instrumentation Identity (IMEI). this can be introduced within the phonephone at the season of grouping and "can't" be modified. it's invaded by the system amid enrollment to review whether or not the mechanical assembly has been accounted for as taken.

The SIM or Subscriber Identity Module contains the data that gives the character of the client to the system. It consolidates different kinds of data alongside a number known as the International Mobile Subscriber Identity (IMSI).

Base Station Subsystem (BSS):

he Base Station scheme (BSS) phase of the GSM organize engineering is with competence connected with the phone frameworks on the system. It contains 2 elements as takes after:

Base Transceiver Station (BTS): The BTS utilised as a vicinity of a GSM prepare find out of the connected recieving wires that transmit, sender recipients,

get to specifically speak with the mobiles. The BTS is that the characterizing part for each cell. The BTS speaks with the mobiles and therefore the interface

between the 2 is thought because the Um interface with its connected conventions.

Base Station Controller (BSC): The BSC frames the furthur prepare in reverse into the GSM organize. It controls a gathering of BTSs, and is usually co-situated with one in all the BTSs in its gathering. It directs the radio assets and limit things, as an example, relinquishment within the gathering of BTSs, assigns channels and therefore the equivalent. It speaks with the BTSs that is known as the Abis interface.
Network switch scheme (NSS)

The GSM system design involve a spread of distinct components, and is frequently termed because the core network. it's supplied with the most management and interfacing for the integral mobile network. the first components within the core network include:
]
Mobile Switching services Centre (MSC*):* The Mobile exchanging Services Center is the prime constituent inside the center system territory of the general GSM arrange engineering .The exchanging administrations acts like a typical exchanging hub inside a PSTN or ISDN, yet in addition gives added capacities to empower the fundamentals of a portable client to be upheld. These joins confirmation enrollments, between exchanging handovers, call area, between MSC handovers and call directing to the portable proprietor. It in like manner gives a stage interface to the Public exchanged phone organize on the off chance that calls directed from the portable system to a wireless associated with a landline. To empower calls to be made to mobiles on various systems, interfaces to different MSCs are given.

Home Location Register (HLR):): this kind of info joins all the regulative directions around each supporter aboard their past recognized space. on these lines, the GSM organize is ready to course calls to the right base station for the MS. At the purpose once a shopper turn on his phonephone, the phonephone enrolls on the system and from this it's potential to form sense of that BTS it

speaks with thus approaching calls will be steered befittingly. yet once the phonephone is not dynamic (however changed on) it re-enrolls often to guard that the system; is unsure of its most up-to-date position. there's one HLR per organize, yet it will be spread across to totally different sub-habitats for various operational reasons

Visitor Location Register (VLR): This involves developed information from the HLR which enables the picked organizations for the individual subcsriber to be kept up. The VLR can be realized as a self-sufficient component, in any case it is generally master as a basic bit of the MSC, instead of an indivisual component. Thusly get to is made snappier and more invaluable.

Equipment Identity Register (EIR): win, permitted onto the system The EIR is a substance that closes whether an assuming taking off hardware make out accord to the book onto the system. Every versatile contraption has a numeral as related the International Mobile Equipment Identity. This residence, destined above, is ready to deal with in the gear and is investigated aside merge middle enrollment. Subordinate upon the taste held in the EIR, the portable am inside such region be distributed one of the three states - banished**,** or checked in how things stack up its issues.

Authentication Centre (AuC): The AuC is a guarded database that enclose the secret key also involve in the SIM card pf the user. It is passed down for authentication and for ciphering on the radio channel.

Gateway Mobile Switching Centre (GMSC): The GMSC is a check to which a ME finishing call is at first guided with no learning of the MS's spot. The GMSC is subsequently in charge of recovering the MSRN (Mobile Station Roaming Number) from the HLR in perspective of the MSISDN which suggests Mobile Station ISDN number that is the "registry number" of a MS and guiding the call to the secured passed by MSC. The "MSC" some bit of the word GMSC is overwhelming, as the section movement does not require any linkage to a MSC.

SMS Gateway (SMS-G): The SMS-G or SMS gateway is a terminolgy which is accustomed mutually depict the two Short Message Services Gateways defined in the GSM standards. The two gateways handle messages directed in variant directions. The SMS-GMSC which stands for Short Message Service Gateway Mobile Switching Centre, is for short messages that are sent to an ME. The SMS-IWMSC i.e Short Message Service Inter-Working Mobile Switching Centre is used for short messages commenced with a mobile on that network. The SMS-GMSC part is identical to that of the GMSC, while the SMS-IWMSC provisions with a fixed access point to the Short Message Service Centre.

Operation and Support Subsystem (OSS)

The OSS called operation support scheme may be a element within the whole GSM structure engineering that is connected to the components of the NSS and therefore the BSC. it's used to administrate and direct the whole GSM system and it's to boot conversant in management the movement heap of the BSS. it's principal to be detected that because the amount of SB ascends with the scale of the supporter world some of the payment work area unit enraptured to the BTS that gifts investment within the value of proprietary of the framework.

6.3 Steps to interface gsm modem with microcontroller:

STEP 1: modem testing:

The Modem subsists of Green and Red , two indicating LED’s to indicate the opportunity of the network. Red indicates its absence whereas Green indicates the availability of the network . modem is turned ON and wait for some time to register itself in GSM network.

STEP 2: Interfacing with avr microcontroller:

The Communication in the midst of AVR and modem happen through USART convention. We would interface be able to straight with pins RXD and TXD of AVR microcontroller as GSM Modem SIM900 works on TTL level. There is no earnestness of utilizing Voltage or level converter between them. Be that as it may on the off chance that you ever happen to buy a SIM300 or other module which works above TTL level, you may need to utilize MAX232 level converter IC to cause the correspondence conceivable.

STEP 3: Initializing modem:

The modem should be Initialized using the commands and then the process must be selected which you are about to carry.

6.4 CIRCUIT DIAGRAM

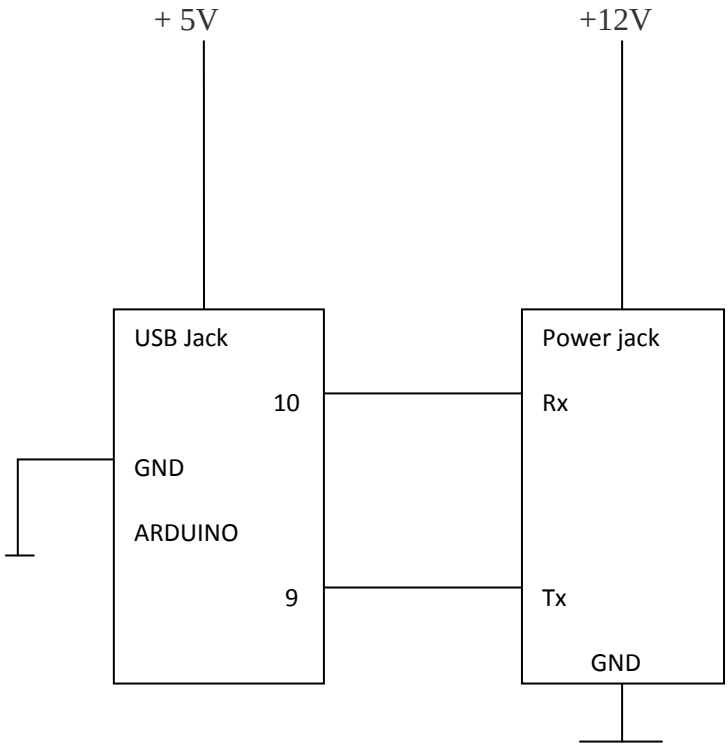


fig. 6.3 circuit diagram

CHAPTER 7

CONCLUSIONS AND FUTURE SCOPE

In today's world girl's security may be a major issue. this method can facilitate give security to the operating ladies by exploitation alerts and emergency buttons so as to avoid any hurdles faces by them. Such system is extended with alert messages and button by our planned model to beat the matter of ladies employee's security which will be enforced for firms that have sizable amount of ladies workers operating in night shifts and by the businesses that area unit located far from the residential places.

Following options like push to come up with alarm and send message to the system, capturing pictures connecting anroid and causation the images on trigger of push, provision of location of car once fix amount, viewing location of car on google maps that is definitely out there square measure the facility planing machine of planned model however still providing security seamlessly at any time with none useful or physical device failure interventions remains a future issue that has to be resolved.

REFERENCES

RESEARCH PAPERS

1. Nishant Bhardwaj and Nitesh Aggarwal- " Design and Development of SURAKSHA a women safety device." ***International Journal of Information Computation Technology. ISSN 0974-2239 Volume 4, Number 8 (2014), pp. 787-792 © International Research Publications House*** ***http://www.irphouse.com/***

2. PremKumar.P, Cibbichakkarvarthi- **"**One touch alarm system for women's safety using GSM." ***International journal of Science, Technology and "Management, Volume no. 04, Issue no. 01, March 2015, ISSN 2394-15237*** ***http://www.ijstm.com***

3. 1S.Sangeetha, 2P.Radhika – " Application for women safety" ***IOSR Journal of Computer Engineering (IOSR-JCE) e-ISSN: 2278-0661,p-ISSN: 2278-8727, Volume 17, Issue 3, Ver. IV (May – Jun. 2015), PP 01-04*** ***www.iosrjournals.org***

4. B. Vijyalakshi, Renuka – "Self defense system for women safety with location tracking and SMS alert by GSM***" Journal of Electrical & Electronic Systems, DOI: 10.4172/2332-0796.1000233***
www.eesjournal.org

5. Divya chitkara, Nipun Sachdeva, Yash Dev Vashisht- " Design of Women safety device", ***Humantarrian technology conference, 2006, IEEE region 10, NSPEC Accession Number: 16837030***
www.ieeeexplore.org

6. X. Shu, Z. Du, and R. Chen-" Research on mobile location service design based on Android***" 5th International Conference on Wireless Communications, Networking and Mobile Computing2009, 24-26 Sept 2009, pp. 1-4.***
www.eesjournal.org

7. S Mohamed Ashiq1, C Manivelprabhu2 –"Design of Electric Shock Antenna Watch with Automated SMS Facilities for Women Safety in India" ***under Government License S Mohamed Ashiq1, C Manivelprabhu2***

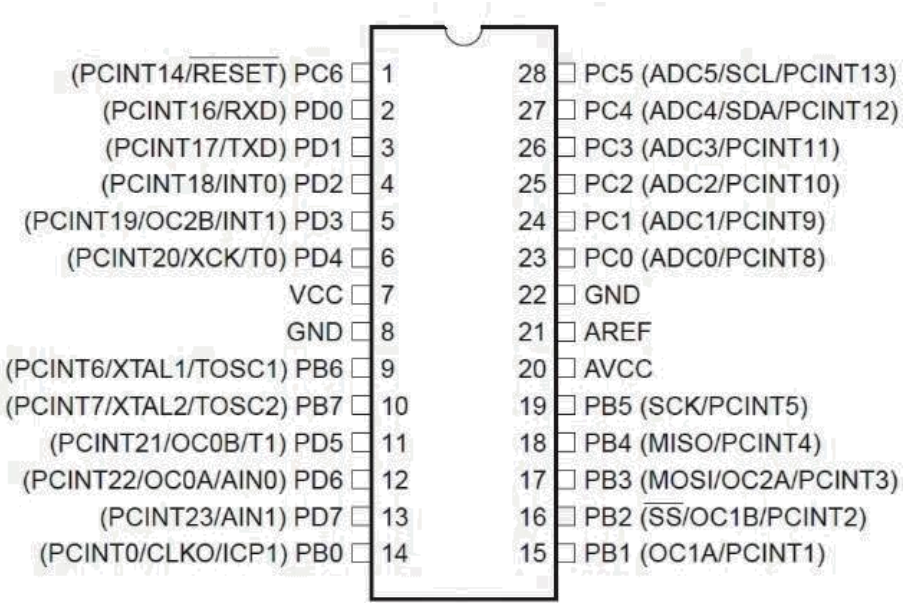
web sources

1. https://www.open-electronics.org/gsm-remote-control-part-4-sim900/
2. http://www.electronicwings.com/avr-atmega/sim900a-gsm-module-interfacing-with-atmega1632-
3. http://www.instructables.com/id/GSM-SIM900A-With-Arduino/
4. https://en.wikipedia.org/wiki/Atmel_AVR
5. http://www.avr-tutorials.com/digital/digital-input-output-c-programming-atmel-avr-8-bits-microcontrollers
6. http://www.eng.utah.edu/~cs5789/handouts/piezo.pdf
7. http://www.circuitstoday.com/ultrasonic-rangefinder-using-arduino
8. https://computer.howstuffworks.com/e-mail-messaging/sms.htm
9. https://www.researchgate.net/publication/257198684_Forms_and_functions_of_SMS_messages_A_study_of_variations

APPENDIX

Microcontroller ATMEGA328 Datasheet

Pin Diagram:



Pin Description:

Pin Number	Description	Function
1	PC6	Reset
2	PD0	Digital Pin (RX)
3	PD1	Digital Pin (TX)
4	PD2	Digital Pin
5	PD3	Digital Pin (PWM)
6	PD4	Digital Pin
7	Vcc	Positive Voltage (Power)
8	GND	Ground
9	XTAL 1	Crystal Oscillator
10	XTAL 2	Crystal Oscillator
11	PD5	Digital Pin (PWM)
12	PD6	Digital Pin (PWM)
13	PD7	Digital Pin

16	PB2	Digital Pin (PWM)
17	PB3	Digital Pin (PWM)
18	PB4	Digital Pin
19	PB5	Digital Pin
20	AVcc	Positive voltage for ADC (power)
21	Aref	Reference Voltage
22	GND	Ground
23	PC0	Analog Input
24	PC1	Analog Input
25	PC2	Analog Input
26	PC3	Analog Input
27	PC4	Analog Input
28	PC5	Analog Input

20 of the pins work as I/O ports. This implies they can work asn contribution to the circuit. Regardless of whether they are input or output is set in the product. 14 of the pins are computerized pins, of which 6 can capacity to give PWM yield. 6 of the pins are for simple input or output.

2 of the pins are for the crystal oscillator. This is to give a clock pulse to the Atmega chip.

A clock pulse is required for synchronization with the goal that correspondence can happen

in synchrony between the Atmega chip and a gadget that it is associated with.

The chip needs power so 2 of the pins, Vcc and GND, provide it power so that it can operate.

The Atmega328 is a low-power chip, so it only needs between 1.8-5.5V of power to operate.

The Atmega328 chip has an analog-to-digital converter (ADC) inside of it. This must be or else the Atmega328 wouldn't be capable of interpreting analog signals. Because there is an ADC, the chip can interpret analog input, which is why the chip has 6 pins for analog input. The ADC has 3 pins set aside for it to function- AVCC, AREF, and GND. AVCC is the power supply, positive voltage, that for the ADC. The ADC needs its own power supply in order to work. GND is the power supply ground. AREF is the reference voltage that the ADC uses to convert an analog signal to its corresponding

digital value. Analog voltages higher than the reference voltage will be assigned to a digital value of 1, while analog voltages below the reference voltage will be assigned the digital value of 0. Since the ADC for the Atmega328 is a 10-bit ADC, meaning it produces a 10-bit digital value, it converts an analog signal to its digital value, with the AREF value being a reference for which digital values are high or low. Thus, a portrait of an analog signal is shown by this digital value; thus, it is its digital correspondent value.

The last pin is the RESET pin. This allows a program to be rerun and start over.