GSM BASED BLIND STICK WITH

GPS TRACKING SYSTEM

This project report submitted in partial fulfillment of the requirements
for the Award of Degree of
Bachelor of Science in Electrical and Electronic Engineering

Submitted By

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October 2019

Certification

This is to certificate to that this project entitled **"GSM Based Blind Stick With GPS Tracking System"** is done by the following student under my direction supervision and this work has been carried by the laboratories of the department of electrical and electronic engineering under the faculty of engineering of daffodil international university in partial fulfillment of the requirements for the degree of bachelor of science in electrical and electronic engineering .the presentation of the work was held on October 2019.

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LIST OF ABBREVIATIONS

IC	Integrated Circuit
LCD	Liquid Crystal Display
BFSK	Binary Frequency Shift-Keyed Signal
GSM	Global System for Mobile(Communication)
CT	Current Transformer
KHZ	Kilo Harz
KV	Kilo Volt
AC	Alternating Current
IC	Integrated Circuit
SIM	Subscriber Identification Module
DC	Direct Current
LED	Light Emitting Diode
Np	Primary Winding
CD	Circular Disk
WHO	World Health Organization
Is	Secondary Current
Ip	Primary Current
MHZ	Mega Harz
USB	Universal Serial Bus
KB	Kilo Byte

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First we express our heartiest thanks and gratefulness to almighty Allah for His divine blessing makes us possible to complete this project successfully. We are grateful and wish our profound our indebtedness to **PROVAKAR MONDOL, Lecturer**, Department of Electrical and Electrical Engineering, Daffodil International University, Dhaka. Deep theoretical and hardware knowledge & keen interest of our supervisor in this field influenced us to carry out this project. His endless patience, scholarly guidance ,continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting them at all stage have made it possible to complete this project.

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ABSTRACT

This paper presents a theoretical and practical model of GSM based blind stick with GPS tracking system . Blind stick is an innovative stick designed for visually disabled people for improved navigation. We here propose an advanced blind stick that allows visually challenged people to navigate with ease using advanced technology. This system is intended to provide overall measures object detection and real time assistance via Global Positioning System (GPS).The system consist of ultrasonic sensor, GPS Module, GSM Module and buzzer alarm circuit. This project aims at the help blind people to find obstacle free path .

CHAPTER 1

INTRODUCTION

1.1   Introduction

Blindness is a common disability among the peoples throughout the world. According to the Distance detector is any device capable of measuring the distance between two points. The origins of distance measurement by means of graduated lengths of material such as chain, tape measure or piece of knotted rope are lost to antiquity. Optical distance measurement also has a long history, and is usually taken to stem from the work of James Watt in 1771. Electro-magnetic measurements make up a third method, where the time of travel of radio or light waves is converted into a distance. Since James Watt, hundreds of different types of instrument have been produced to make indirect distance measurement using light. All kinds of devices or equipment nowadays, begin with the basic design, basic theory and then all the weakness follows by improvement step by step. This project will serve the same purpose. In this improvement can be applied to bring the advantages to the user when measuring the distance by troubleshooting several problems that arises. In that process embedded system play to major role.

This project is about an alternative to walking stick which is normally used by blinds. It is fully automated, easy to maintain, cheap and it is very comfortable to use. The power consumption is low and can be operated easily. Above all the alternative is economic over the conventional options. It is an arm band that contains a circuit board.

World Health Organization (WHO) 285 million people are visually impaired worldwide, 39 million are blind and 246 million have low vision. About 90% of the world's visually impaired live in the developing countries . For the indigents and remotely rural living people

blindness is a curse as they need help to work outside and do all other daily essential works. This paper glows a system that tries to remove the curse of blindness and make them self-dependent to their daily chores.

1.2 Historical Background

Since ongoing obstacles usually generate noise while going , blind people develop their feeling of hearing to localize them. A visionless person commonly uses a white cane or walking cane for navigation. The walking cane is a simple and purely mechanical device to detect static obstacles on the ground, uneven surfaces, holes and steps through simple tactile-force feedback.

The walking cane is light, portable, but its range is limited to its own size and is not usable for dynamic components. Another option that provides the best travel aid for the blind is the guide dogs. Based on the symbiosis between the blind owner and his dog, the training and the relationship to the animal are the keys to success.

Them in walking with less accident. Some research works outline a better navigational tool for the visually impaired by consisting of a simple walking stick equipped with sensors to give news about the sphere. GPS technology is integrated with pre-programmed locations to determine the optimal route to be taken. The user can choose the location from the set of destinations stored in the memory and will lead in the correct direction of the stick used. The overall aim of the device is to provide a convenient and safe.

Along with GPS technology, there are smart blind sticks employing infrared technologies. This not only assists blind people but also assists people with low vision. There can be mechatronic sticks. Ultrasound sensors can be put on arm or on forehead according to the comfort level of the user. Even there can be smart wheelchair using the same methodology and circuitry implemented on a different hardware. There can be different algorithms for the circuit to perform the intended operation. There are vision touch phone and smart environment explorer stick. All are different versions of the smart blind stick. These are available in the market in different names as smart blind stick or smart mobility stick or intelligent guiding stick or electronic guiding stick etc.

1.3 Objective

The main objective is to help visually challenged people to navigate with ease using advance technology and Blind people will be safely walk street by stick and suddenly blind people face problem than push baton click and her family member will get a sms and easily search her location. by GPS tracking her position.

1.4 Methodology

In this paper our main aim is blind people easily walk street by stick .The System is based on the interruption of ultrasonic sensor and GSM is used as the face she problem than push button click messaging system and arduino as the master controller has ultrasonic sensor and GSM,GPS module. It should be powered with 5 volt DC supply and fixed on blind stick arduino nano is use to collect the data and shown the output of LCD display.

1.5 Project Outline

Chapter 1: Introduction
Chapter 2: Overview f the Project
Chapter 3: Theoretical Model
Chapter 4: Hardware Component
Chapter 5: Design and Implementation
Chapter 6: Result and Discussion
Chapter 7: Conclusion

1.6 Summary

In this chapter is first chapter we are discussing introduction , background of this project ,Main purpose discussing Blind people will be safely walk street by stick and suddenly blind people face problem than push baton click and her family member will get sms. GSM and GPS based project that contribute to the modern society there are many of our blind people .

CHAPTER 2

OVERVIEW OF THE PROJECT

2.1 Introduction

GPS based blind man device with user input interfacing to get alerts for few places is a micro controller based device which intellectually find the location in which it was currently located and gives the alert to the blind man if it was his destination area. This GPS is acronym for Global Positioning System. It is engaged to find the position this user is located on the world. This news is gives by the GPS with the boost of the data receives from the satellites. Micro controller is the bosom of the device. It stores the data of the present location which it receives from GPS system. This device helps the blind people in their journeys. This device is designed to provide with a greater advantage producing voice based announcement for the user .

2.2 Ultra Sonic Sensor

Ultrasonic sensor are use measure distance by using ultrasonic wave. Ultrasonic sensor have transmitter and receiver. The ultrasonic sensor head emit a ultrasonic wave and transmit to font this wave ,when the wave reflect any object ,then receiver the wave reflect back from the object. Transmitter and receiver are use a single ultrasonic element both emission and reception.

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Figure 2.1:Ultrasonic Sensor

2.3 Buzzer

Buzzer is a electronics device .This device audio signaling which may be mechanical, Electromechanical or piezoelectric. Generally uses of buzzers include alarm device and timers.

Figure 2.2:Buzzer

2.4 GSM

The Global System for Mobile Communications (GSM) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation (2G) digital cellular networks used by mobile devices such as mobile phones and tablets. It was first deployed in Finland in December 1991. By the mid-2010s, it became a global standard for mobile communications achieving over 90% market share, and operating in over 193 countries and territories.

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2.5 Arduino Nano

Arduino Nano is a microcontroller board based on the ATmega328. It contains everything needed to support microcontroller. The software was customized for the function of the weather station monitoring on wind speed and wind direction.

2.6 Global Position System

GPS means global position system .GPS use for tracking of satellite to indicate the location of a device was specifically designed for various purpose. The basic concept is a GPS tracker this process called trilateration to indicate its physical location based on its far from three satellites. this is another technic used your portable or car direction system.

2.7 Summary

An Arduino nano has been used for the main controlling system. Ultra sonic sensor has been used for sensing the object. GSM module (SIM) use the work of send sms. Buzzer use in this project when object detect then create automatic alarm. GPS tracking help of the blind people position easily find out of her family.

CHAPTER 3

THEORETICAL MODEL

3.1 Introduction

Nowadays the telecommunication technologies become wider and more new features exist to make human life better. This project will use an ARDUINO NANO.

3.2 Defining of ARDUINO

An arduino is a microcontroller based circuit. An arduino have embedded a microcontroller ,input and output ports, data transmitter and receiver section, USB ports etc. Arduino work by programming . the inputs device a arduino is sensor, switch ,transducer etc. many program are use arduino. such c,c++ . Arduino basically used in communication and in controlling process many devics.

Figure 3.1 : ARDUINO

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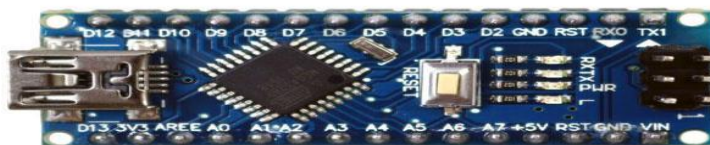
3.2.1 Arduino Architecture

Arduino's processor basically uses the Harvard architecture where the program code and program data have separate memory. It consists of two memories- Program memory and the data memory. The code is put away in the blaze program memory, while the information is put away in the information memory. The Atmega328 has 32 KB of blaze memory for putting away code (of which 0.5 KB is utilized for the bootloader), 2 KB of SRAM and 1 KB of EEPROM and works with a clock speed of 16MHz.

Figure 3.2:Arduino Architecture

3.2.2 Arduino Pin Diagram

A typical example of Arduino board is Arduino Uno. It consists of ATmega328- a 28 pin microcontroller.
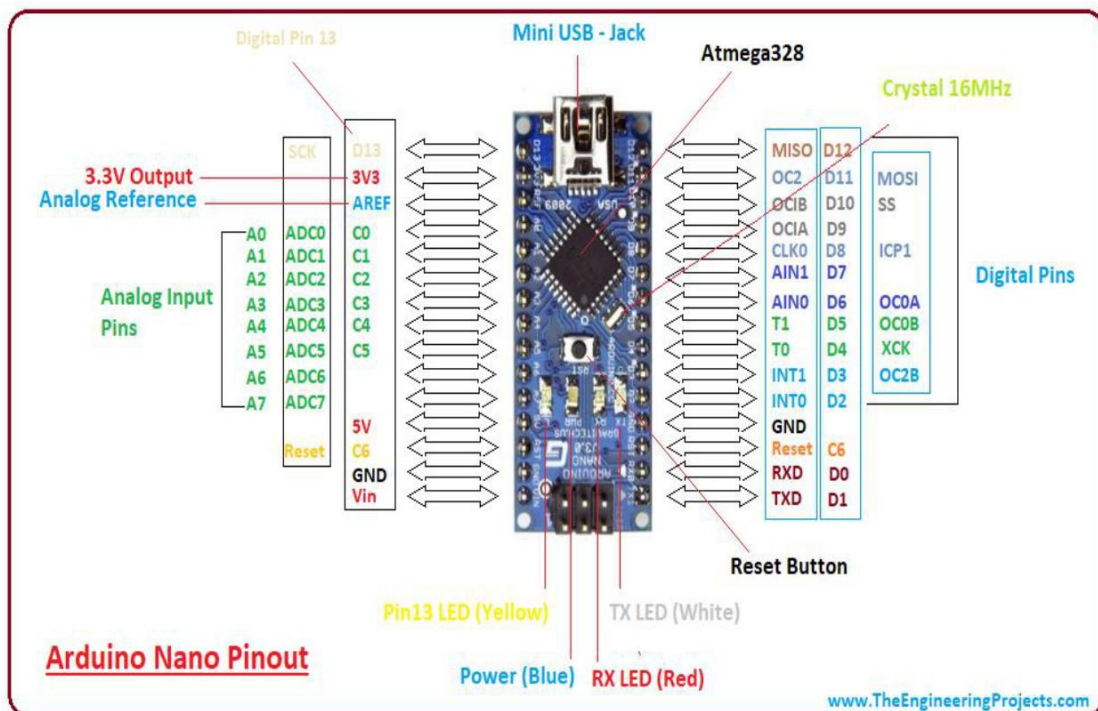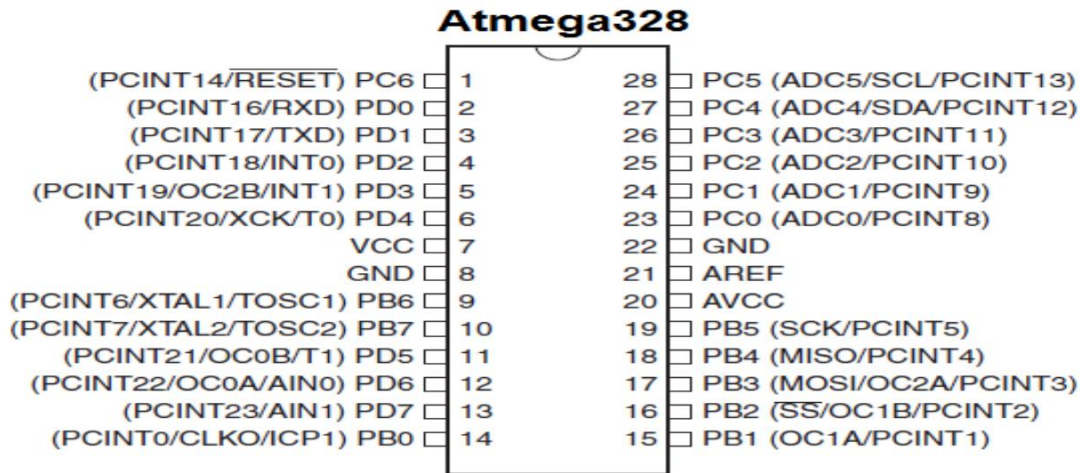
Figure 3.4:Arduino Pin diagram

Power Jack: Arduino are power either from the pc through a USB . It can operate supply of 7 to 12V. Power can be applied externally through the pin Vin .

Digital Inputs: It consists of 14 digital inputs/output pins, each of which provide or take up 40mA current. Some of them have 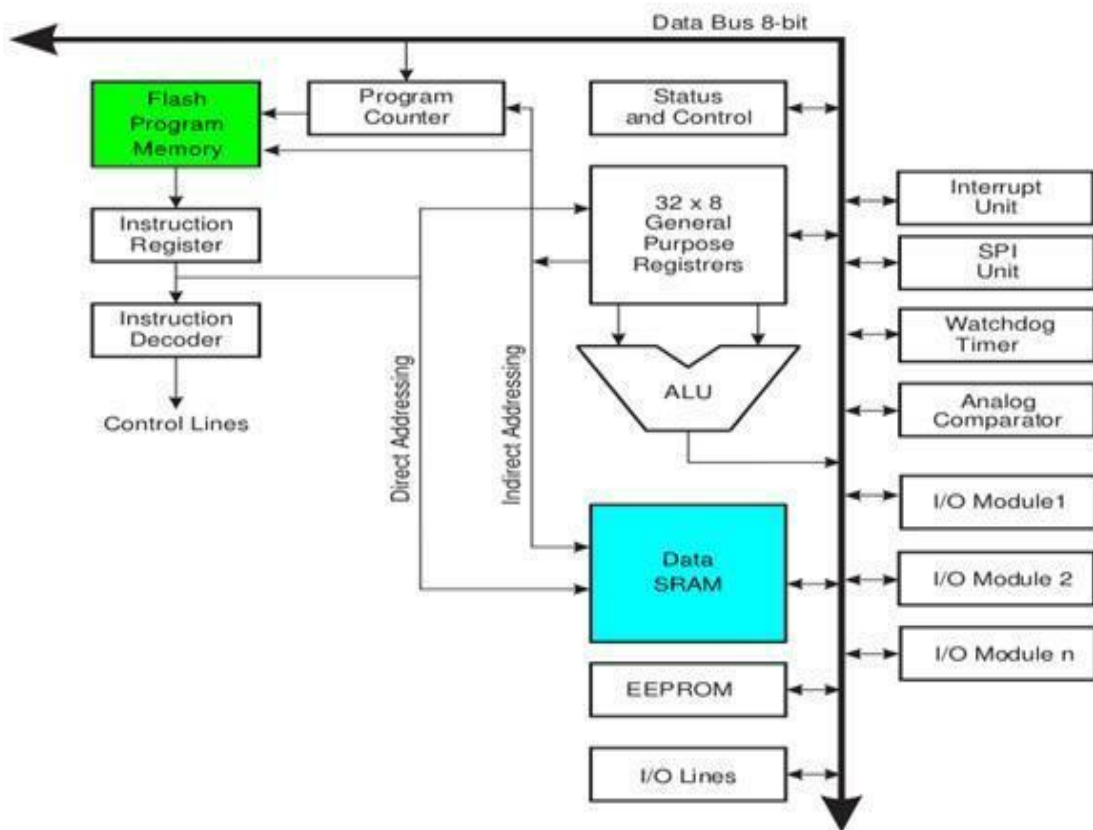special functions like pins 0 and 1, which act as Rx and Tx respectively , for serial communication, pins 2 and 3-which are external interrupts, pins 3,5,6,9,11 which provides pwm output and pin 13 where LED is connected.

Analog inputs: It has 6 analog input/output pins, each providing a resolution of 10 bits.

ARef: It provides reference to the analog inputs

Reset: It resets the microcontroller when low.

3.2.3 Program an Arduino

The most important advantage with Arduino is the programs can be directly loaded to the device without requiring any hardware programmer to burn the program.
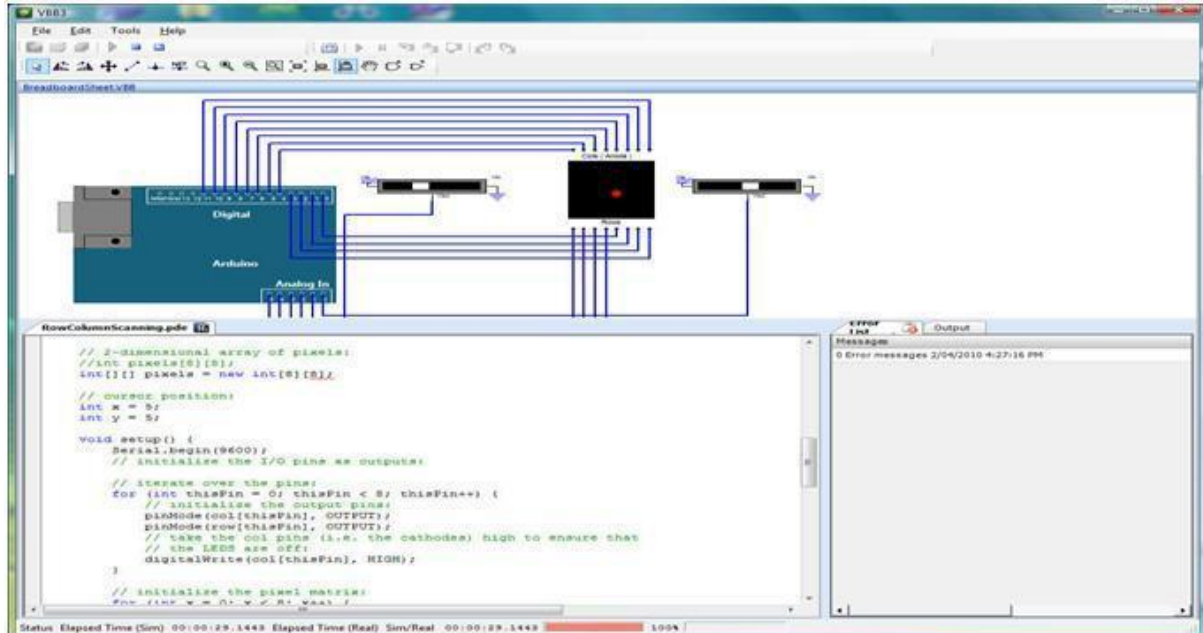
This is done because of the presence of the 0.5KB of Bootloader which allows the program to be burned into the circuit. All we have to do is to download the Arduino software and writing the code.

The Arduino tool window consists of the toolbar with the buttons like verify, upload, new, open, save, serial monitor. It also consists of a text editor to write the code, a message area which displays the feedback like showing the errors, the text console which displays the output and a series of menus like the File, Edit, Tools

5 Steps to program an Arduino

• Programs written in Arduino are known as sketches. A basic sketch consists of 3

parts 1. Declaration of Variables

2. Initialization: It is written in the setup () function.

3. Control code: It is written in the loop () function.

• The sketch is saved with .ino extension. Any operations like verifying, opening a sketch, saving a sketch can be done using the buttons on the toolbar or using the tool menu.

• The sketch should be stored in the sketchbook directory.

• Chose the proper board from the tools menu and the serial port numbers.

• Click on the upload button or chose upload from the tools menu. Thus the code is uploaded by the boot loader onto the microcontroller.

Few of basic Adruino functions are:

• digital Read(pin): Reads the digital value at the given pin.

• digital Write(pin, value): Writes the digital value to the given pin.

• pin Mode(pin, mode): Sets the pin to input or output mode.

• analog Read(pin): Reads and returns the value.

• analog Write(pin, value): Writes the value to that pin.

• serial. begin(baud rate): Sets the beginning of serial communication by setting the bit rate.

3.2.4 Technical Specification of Arduino Microcontroller

ARDUINO MICROCONTROLLER	
Microcontroller	ATmega-328
Architecture	AVR
Operating Voltage	DC-5V
Flash Memory	32 KB of which 0.5 KB used by boot loader
SRAM	2.0KB
Clock Speed	16.0 MHz
Analog I/O Pins	6.0
EEPROM	1.0 KB
DC current per I/O pins	40 mA on I/O pins; 50 mA on 3,3 V Pin

Table No 3.1: Technical Specification

3.4 Technical Specification of General

GENERAL	
Input Voltage	7.0-12 V
Digital I/O Pins	20 (of which 6 provide PWM output)
PWM Output	6.0
PCB Size	53.4×68.6 mm
Weight	25.0 Kg

Table No 3.2: Technical Specification (General)

3.5 Power

Below the power pins:

• VIN: the input voltage are supply the arduino board by an use an external source. normally input supply voltage is 5v.

• 5V: use a regulated power for regulated microcontroller and various potion on board. GND: Ground pins.

3.6 Memory

The microcontroller number is Atmega -328 and have 32KB flash memory for store code. This controller are has 2KB SRAM and 1KB EEPROM.

3.7 Inputs and outputs

• Serial: 1 (TX) and 0 (RX). Used to get (RX) and transmit (TX) TTL sequential information. The pin are associated with the relating pins of the ATmega-8U2 USB-to-TTL Serial chip.

• PWM: 3, 5, 6, 9, 10, and 11. Furnish 8-piece PWM yield with the simple Write() work.

• SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins support SPI correspondence, which, isn't as of now incorporated into the Arduino language.

• LED: 13 There is a worked in LED associated with advanced stick 13. At the point when the stick is HIGH worth, the LED is on,

• Reset. Regularly used to add a reset catch to shields which square the on the board.

3.8 Summary

An arduino is a microcontroller based circuit. An arduino have embedded a microcontroller ,input and output ports, data transmitter and receiver section, USB ports etc. Arduino work by programming . the inputs device a arduino is sensor, switch ,transducer etc. many program are use arduino. such c,c++ .
  •

CHAPTER 4

HARDWARE DEVELOPMENT

4.1 Introduction

We are living in the attached world .You are surrounded with many embedded product and your life largely depended on the proper functioning is of these,television , radio ,CD ,layer of your living room, washing machines or microwave oven in your kitchen ,card readers ,access controllers, palm device of tour work space enable to many of your takes very effectively apartment from all these. Apart from all these ,many controller.

4.2 Components

- ARDUINO (NANO)\
- Center Taped Transformer
- Resistor
- Variable Resistor
- Capacitor
- Diode
- Voltage Regulator
- LED
- Buzzer
- LCD
- Transistor
- DC Battery
- Varo Board
- Switch

- Some wires

- GPS Module

- GSM Module

- Vibration Motor

4.3 Center-tapped Transformer

 A transformer is a electrical device that transfer electrical energy by role of electromagnetic induction. When the transfer energy then the constant voltage and frequency. A Center tapped transformer are designed for normal secondary transformer. Secondary coil are separate. When primary AC voltage will be supply in the primary coil, then magnetic flux induce and energy transfer to output. The primary coil turn call T1 and Secondary coil turn call T2. which will be placed exactly at the center of the secondary coil, hence the voltage here will always be zero.
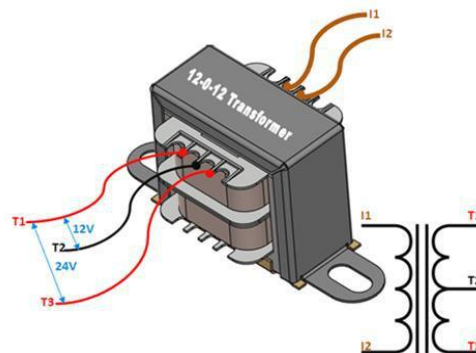

Figure 4.1: Center Taped Transformer With Symbol

As we know the voltage across the coil depends on the number of turns on the primary and secondary coil. Using the turns ratio formulae we can calculate the secondary voltage as:

Va=(Na/Nb)*Vp

Vb=(Nb/Nb)*Vp

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Where:

Va=Voltage across the first half of secondary coil

Vb= Voltage across the secondary half of secondary coil

Vp= Voltage across the primary coil

Na= Voltage across the first half of secondary coil

Nb= Number of turn in the first half of secondary coil

Nb= Number of turn in the secondary half of secondary coil

4.3.1Specifications

- Step-down Centre tapped Transformer
- Input Voltage: 220V AC at 50Hz
- Output Voltage: 24V, 12V or 0V
- Output Current: 1A
- Vertical mount type
- Low cost and small package

4.4 Resistor

A resistor is an electrical part with two terminals that is utilized to restrain or direct the progression of electrical flow in electronic circuits. Its motivation is to lessen current stream just as lower the voltage levels in its general region or bit of the circuit. A resistor is intended to direct the real burden on the framework, implying that it uses up power and scatters it as warmth, in this manner adequately lessening the measure of power streaming out of it by

Explicit sums.
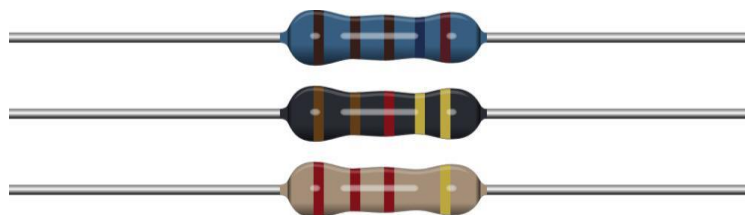
Figure 4.2: Resistor

4.4 .1 Type of resistor

Resistor Are two type:

i. Fixed resistor

ii.Vriable resistor

4.4.2 Fixed resistor

Fixed resistors are the most oftentimes utilized resistors in the electronic circuits. These resistors have the fixed opposition esteem. Henceforth, it is beyond the realm to expect to change the obstruction of the fixed resistor.

4.4.2 Variable Resistor

As the name infers, the obstruction of the variable resistor is alterable. It is anything but difficult to shift or change the obstruction of a variable resistor to an ideal worth. Variable resistors are for the most part utilized when the client don't have the foggiest idea what define obstruction worth does he need.
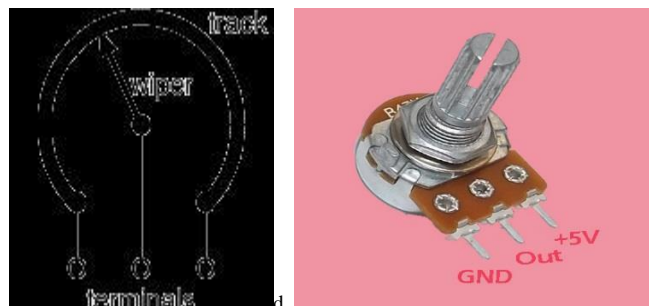
Figure 4.3:Variable Resistor

The way toward constraining or limiting the electric flow to a specific level is called obstruction. The gadget, which is utilized to confine the progression of electric flow to certain level, is called resistor.

4.5 Capacitor

Capacitor is a electronics component. A Capacitor are capable store charge. Capacitor manly two type 1.Electrolight 2. Non- Electrolight . Capacitor have electrode and non-electrode.
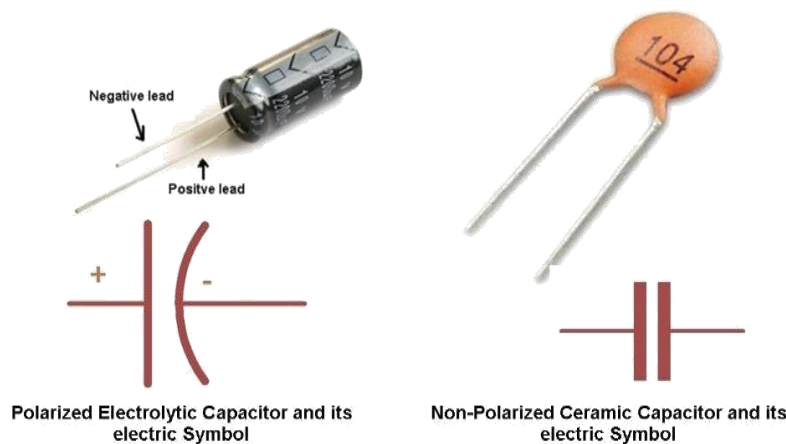
Figure 4.4: Symbol of Capacitor's

During this charging process, a charging current, (i) will flow into the capacitor opposing any changes to the voltage at a rate that is equal to the rate of change of the electrical charge on the plates .This charging current can be defined as: i = CdV/dt. Once the capacitor is "fully-charged" the capacitor blocks the flow of any more electrons onto its plates as they have become saturated. However, if we apply an alternating current or AC supply, the capacitor will alternately charge.

4.6 Diode

A diode is a electronics component. Diode have two terminals anode and cathode ,two layer p-type semiconductor and n-type semiconductor. Anode terminals are positive and cathode terminal are negative .diode are biasing two type ,forward biasing and reverse biasing. Diode are forward biasing flow current anode to cathode and reverse biasing not flow current. Diode are manly use for rectifier .every time diode current flow one direction.

Figure 4.5: Diode

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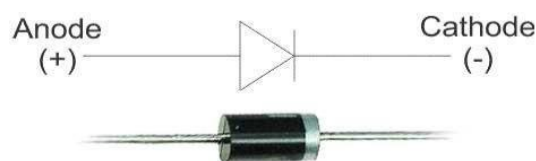
4.7 Voltage Regulator

Voltage regulated ic are regulated dc voltage. When I make a 5volt power supply, IC 7805 voltage regulator as shown in figure has been used Voltage sources in a circuit may have fluctuations resulting in not providing fixed voltage outputs. Voltage regulated ic are output voltage are fixed..The xx in 7805 indicates the output voltage it provides. 7805 IC provides +5 volts regulated power supply with provisions to add a heat sink.
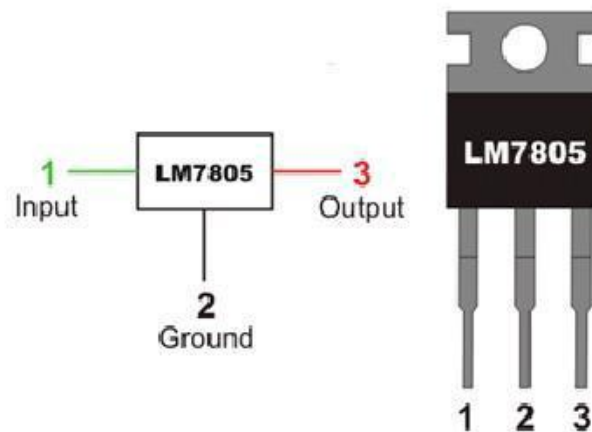
Figure 4.6: Pin Diagram of IC 7805

4.8 GSM SIM MODULE (SIM800L- Overview)

A SIM800l have a quad band system. this called GSM/GPRS module.thise module are work frequency is GSM850MHZ,EGSM900MHZ and PCS1900MHZ.this module are features are GPRS poly –slot class 12,class-10 and this module supports the GPRS coding schemes CS-1,2,3 and 4.
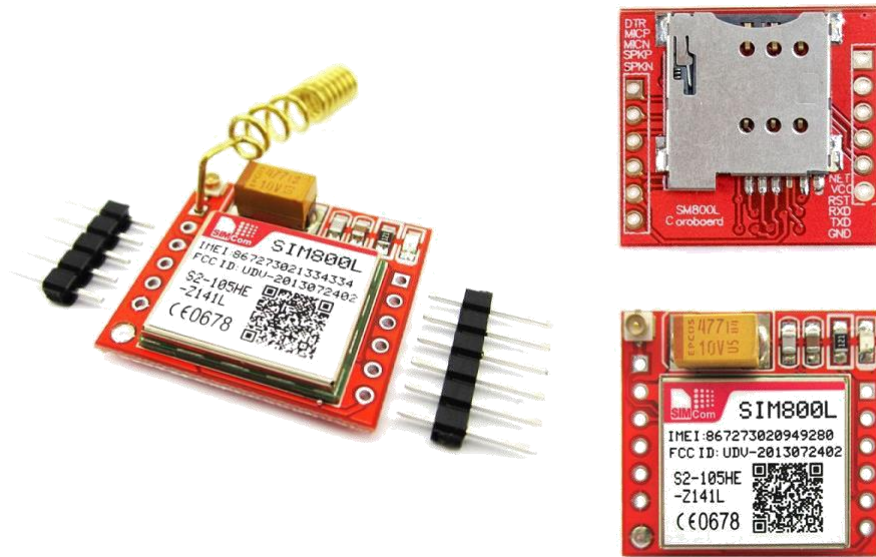
Figure 4.7 :SIM Module

With a small setup of practically all the space prerequisites in client applications, for example, PDA, PDA and other portable devices.SIM800L has 88pin stack of LGA bundling, and gives clients' sheets.

☐ Supports5*5*2 keypads

☐ client can arrange two sequential ports One USB, the USB interfaces can

☐ investigate, download programming

☐ Audio channel which incorporates two mouthpiece input; a collector yield and a speaker yield

☐Programmable broadly useful info and yield.

☐ A SIM card interface

☐ Support- FM

☐ Support one -PWM

SIM800L is planned with power sparing procedure so the present utilization is as low as 0.7mA in rest mode.

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4.9.1 SIM800L Key Features

Feature	Implementation
Power supply	3.5V ~4.4V
Power saving	typical power consumption in sleep mode is 0.7mA (AT+CFUN=0)
Frequency bands	☐ Quad-band: GSM 850, EGSM 900, DCS 1800, PCS 1900. SIM800L can search the 4 frequency bands automatically. The frequency bands can also be set by AT command "AT+CBAND". For details, please refer to document [1]. ☐ Compliant to GSM Phase 2/2+
Transmitting power	Class- 4 (2W) at GSM 850 and EGSM 900 Class -1 (1W) at DCS 1800 and PCS 1900
GPRS connectivity	GPRS multi slot class 12（default） GPRS multi slot class 1~12 (option)
Temperature range	Normal operation: -40°C ~ +85°C Storage temperature -45°C ~ +90°C
Data GPRS	GPRS data downlink transfer: max. 85.60 kbps GPRS data uplink transfer: max. 85.60 kbps Coding scheme: CS-1, CS-2, CS-3 and CS-4 • PAP protocol for PPP connect • Integrate the TCP/IP protocol. • Support Packet Broadcast Control Channel (PBCCH) • CSD transmission rates：2.4，4.8，9.6，14.4 kbps
CSD	• Support CSD transmission
USSD	• Unstructured Supplementary Services Data (USSD) support
SMS	• MT, MO, CB, Text and PDU mode • SMS storage: SIM card
SIM interface	Support SIM card: 1.8V, 3V
External antenna	Antenna pad
	Speech codec modes:

Audio features	- Half Rate (ETS 6.20) - Full Rate (ETS 6.10) - Enhanced Full Rate (ETS 6.50 / 6.60 / 6.80) - *Adaptive multi rate (AMR)* - *Echo Cancellation* - Noise Suppression
CSD	Support CSD transmission
Serial port and debug port	**Serial port:** - Full modem interface with status and control lines, unbalanced, asynchronous. - 1200bps to 115200bps. - Can be used for AT commands or data stream. - Support RTS/CTS hardware handshake and software ON/OFF flow control. - Multiplex ability according to GSM 07.10 Multiplexer Protocol. - Auto bauding supports baud rate from 1200 bps to 57600bps. - upgrading firmware **Debug port:** - USB_DM and USB_DP - Can be used for debugging and upgrading firmware.
Phonebook management	Support phonebook types: SM, FD, LD, RC, ON, MC.
SIM application toolkit	GSM 11.14 Release 99
Real time clock	Support RTC
Timing functions	Use AT command set
Physical characteristics	Size:15.8*17.8*2.4mm Weight:1.35g

Firmware upgrade	Main serial port or USB port.
Serial port and debug port	**Serial port:** Full modem interface with status and control lines, unbalanced, asynchronous. • 1200bps -115200bps. • Can be used for AT commands or data stream. • Support RTS/CTS hardware handshake and software ON/OFF flow control. • Multiplex ability according to GSM 07.10 Multiplexer Protocol. • Auto bauding supports baud rate from 1200 bps to 57600bps. • upgrading firmware **Debugport:** • USB_DM and USB_DP • Can be used for debugging and upgrading firmware.
Phonebook management	Support phonebook types: SM, FD, LD, RC, ON, MC.
SIM application toolkit	GSM 11.14 Release 99
Real time clock	Support RTC

Table No 4.1: SIM Key Feature

4.9.2 Coding schemes and maximum net data rates over air interface

Coding scheme	1 timeslot	2 timeslot	4 timeslot
CS-1	9.05kbps	18.1kbps	36.2kbps
CS-2	13.4kbps	26.8kbps	53.6kbps
CS-3	15.6kbps	31.2kbps	62.4kbps
CS-4	21.4kbps	42.8kbps	85.6kbps

Table No 4.2: Data Rates Over Air Interface

4.9.3 Operating Mode

The table below summarizes the various operating modes of SIM800

Mode	Function	
Noral opera tion	GSM/G PRS SLEEP	The Module are automatically go into sleep mode if the conditions
	GSM IDLE	Software is active. Module is registered to the GSM network, and the module is ready to communicate.
	GS M TA LK	Association between two supporters is in progress. For this situation, the power utilization relies upon organize settings, for example, DTX off/on, FR/EFR/HR, jumping arrangements, reception apparatus.
	GPRS STAND BY	Module is prepared for GPRS information move, however no information is right now sent or gotten. For this situation, control utilization relies upon arrange settings and GPRS design.
	GP RS DA TA	There is GPRS information move (PPP or TCP or UDP) in progress. For this situation, control utilization is connected with arrange settings (for example power control level); uplink/downlink information rates and GPRS design (for example utilized

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Power down	The power input by the external source and power management unit shuts dowan the supply.
Minimum function ality mode	AT command "AT+CFUN" can be used to set the module to a minimum functionality mode without removing the power supply.

Table No 4.3: Operating Mode

4.9.4 Functional Diagram

The accompanying figure shows a useful chart of SIM800L:GSM baseband

- GSM RF
- Antenna interface
- Other interface
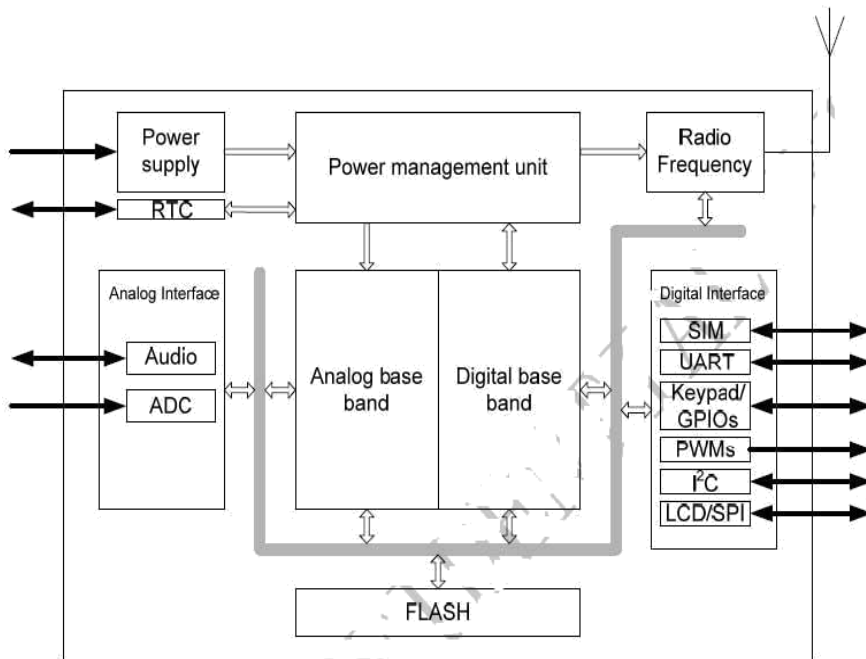
Figure 4.8: Function of SIM diagram

4.9.5 Pin out Diagram

Figure 4.9 : SIM Top view

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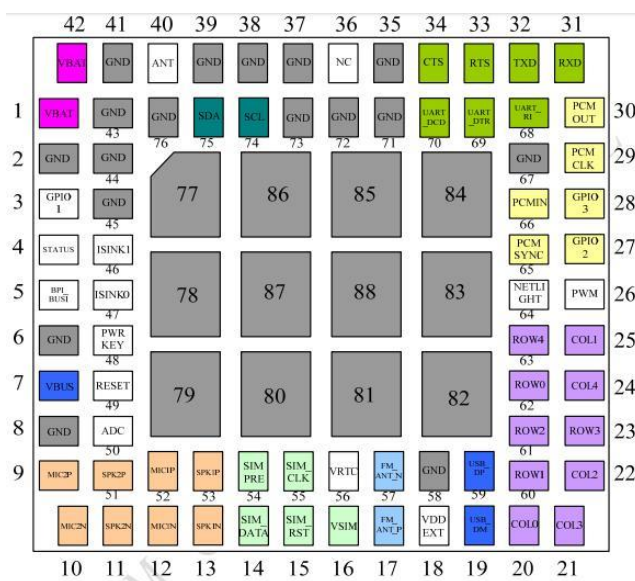
4.9.6 Pin Description

Pin name	Pin number	I/O	Description	Comment
Power supply				
VBAT	1,42	I	Power supply	
VRTC	56	I/O	Power supply for RTC	It is recommended to connect with a battery or a capacitor (e.g. 4.7uF).
VEXT	18	O	2.8V power output	If these pins are unused, keep open.
GND	2,6,8,35,37,38,39, 41,43,44,45,58,67 ,71,72,73,76,77,7 8,79,80,81,82,83, 84,85,86,87,88		Ground	GND for VBAT recommend to use 2,43,44,45pin
Power on/down				
PWRKEY	48	I	PWRKEY should be pulled low at least 1 second and then released to power on/down the module.	Internally pulled up to VBAT.
Audio interfaces				
MIC1P	52	I	Differential audio input	
MIC1N	12			
SPK1P	53	O	Differential audio output	
SPK1N	13			

MIC2P	9	I	Differential audio input	If these pins are unused, keep open.
MIC2N	10			
SPK2P	51	O	Differential audio output	
SPK2N	11			
PCM interface				
PCMCLK	29	O	PCM interface for audio	If these pins are unused, keep open.
PCMOUT	30	O		
PCMSYNC	65	O		
PCMIN	66	I		
Keypads interface				
COL4	24	I	Support up to 50 buttons (5*5*2)	If these pins are unused, keep open.（Pin number 20 external cannot be pulled down）
COL3	21	I		
COL2	22	I		
COL1	25	I		
COL0	20	I		
ROW4	63	O		
ROW3	23	O		
ROW2	61	O		
ROW1	60	O		
ROW0	62	O		
GPIO				
GPIO1	3	I/O	Programmable general purpose input and output	
GPIO2	27	I/O		
GPIO3	28	I/O		
NETLIGHT	64	O	Network status	
STATUS	4	O	Power on status	
Serial port				
UART_DTR	69	I	Data terminal ready	If these pins are unused,
UART_RI	68	O	Ring indicator	
UART_DCD	70	O	Data carrier detect	
CTS	34	O	Request to send	

RTS	33	I	Clear to send			keep open.
TXD	32	O	Transmit data			
RXD	31	I	Receive data			
Debug interface						
VBUS	7	I	Debug and download			If these pins are unused, keep open.
USB_DP	59	I/O				
USB_DM	19	I/O				
ADC						
ADC	50	I	10bit general Converter	analog	t o	digit al	If these pins are unused, keep open.
PWM						
PWM	26	O	Pulse-width modulation			If these pins are unused, keep open.
I^{2}C						
SDA	75	I/O	I^{2}C serial bus data			Need external pulled up
SCL	74	O	I^{2}C serial bus clock			
SIM card interface						
VSIM	16	O	Voltage supply for SIM card. Support 1.8V or 3V SIM card			All signals of SIM interface should be protected against ESD with a TVS diode array.
SIM_DATA	14	I/O	SIM data input/output			
SIM_CLK	55	O	SIM clock			
SIM_RST	15	O	SIM reset			
SIMPRE	54	I	SIM card detection			Reservation function
Antenna interface						
ANT	40	I/O	Connect GSM antenna			
FM_ANT_P	17	I	Differential antenna for FM			
FM_ANT_N	57	I				

Table No 4.4: Pin Description

4.10 Buzzer

A buzzer is a audio signal device, may be a buzzer mechanical, piezoelectric or electro mechanical. Generally use a buzzer for alarm ,timers or indicate. and confirmation of user input such as a mouse click or keystroke .
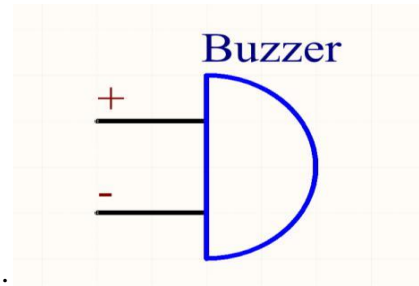
Figure 4.10: Buzzer 5v DC

4.11 LCD Display

LCD (Liquid Crystal Display) is used in all the electronics projects to display the status of the process. A 16x2 alphanumeric LCD is most widely used module of LCD nowadays. There are several others type of LCD available in market also.The reason for choosing LCD over other display component or devices is that it is Low cost, Easily programmable, Large number of display character etc.

16x2 LCD has 2 horizontal line which comprising a space of 16 displaying character. It has two type of register inbuilt that is Command Register, Data Register. Command register is used to insert a special command into the LCD. While Data register is used to insert a data into the LCD. Command is a special set of data which is used to give the internal command to LCD like Clear screen, move to line 1 character 1, setting up the cursor etc
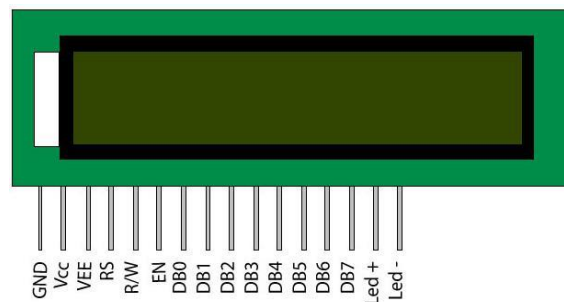

Figure 4.11:LCD Display

4.11.1 Pin statement

Pin No	operation	Name item
1	Ground (0V)	Ground
2	Supply voltage; 5V (4.7V – 5.3V)	Vcc
3	Contrast adjustment ,through a variable resistor	V_{EE}
4	and data register when high ,Selects command register when low.	Select Register
5	High to read from the register ,Low to write to the register.	write /Read
6	when a high to low pulse is given Sends data to data pins	Enable
7		DB-0
8		DB-1
9		DB-2
10	data pins are 8bite	DB-3
11		DB-4
12		DB-5
13		DB-6
14		DB-7
15	Vcc (5V)	Led+
16	Ground (0V)	Led-

Table 4.5: LCD Pin Specifications

4.12 Transistor

 A transistor is a two parts one trans another resistor. Transistor have three terminal emitter. Base and collector,three layer pnp or npn and two junction .transistor are use signal Amplifier and switching . Transistor are two type pnp and npn. Generally npn transistor are many use. This transistor are amplification factor high.at present transistor are many use in electronics circuits.
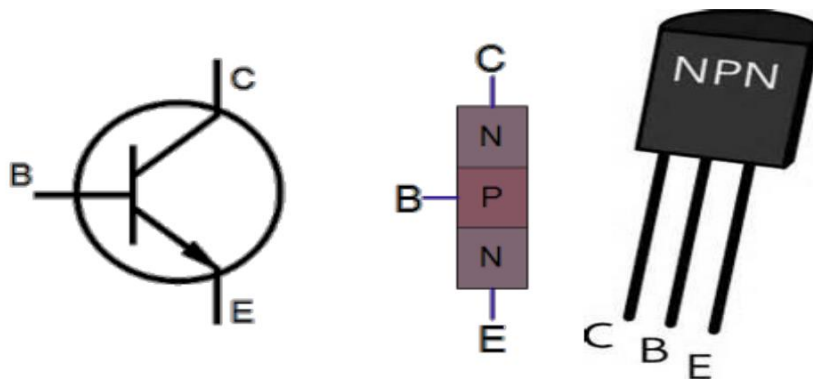
Figure 4.12: Transistor Pin diagram with Symbol

The above figure shows NPN transistor.

4.13 Light Emitting Diode

Means "Light-Emitting Diode." A LED is an electronic gadget that produces light when an electrical flow is gone through it. Early LEDs delivered just red light, however present day LEDs can create a few unique hues, including red, green, and blue (RGB) light. Late advances in LED innovation have made it feasible for LEDs to create white light also.

LEDs are ordinarily utilized for pointer lights, (for example, control on/off lights) on electronic gadgets. A few models incorporate road lights, the red lights on vehicles, and different sorts of improving lighting. You can commonly recognize LEDs by a progression of little lights that make up a bigger showcase. of dabs.
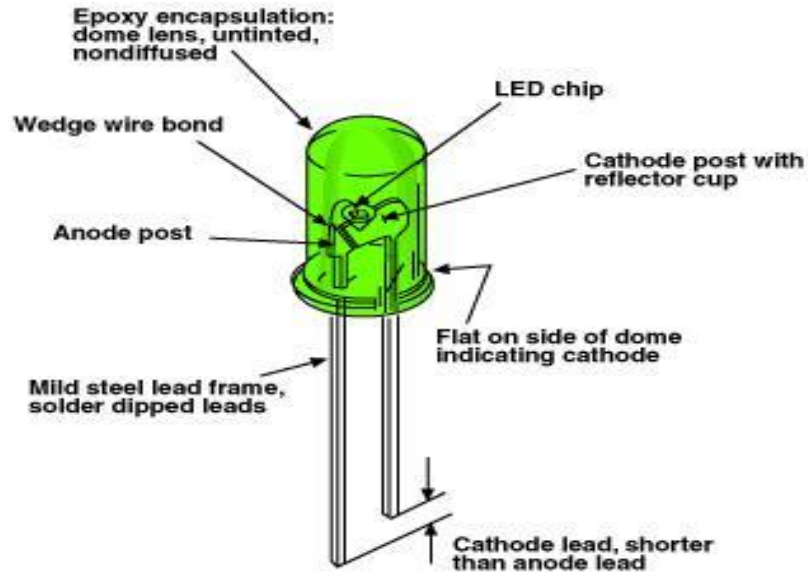
Figure 4.13: LED

4.14 Summary

we are use some electrical device such as step-down transformer, resistor ,capacitor ,diode ,variable resistor, voltage regulator ,dc battery ,some LED with all out put shown the LCD Display battery ,Ultrasonic sensor, LED and GSM and GPS module.

CHAPTER 5

DESIGN AND IMPLEMENTATION

5.1 Introduction

The use of smart device in daily activities increase the quality of life and offer high productivity in turn. This has led to the increase called for benefits such as comfort, Centralize control of appliance ,cost reduction ,energy .Our B.Sc final project is to build ARDUINO NANO with GSM and GPS Tracking system .There by save our life.

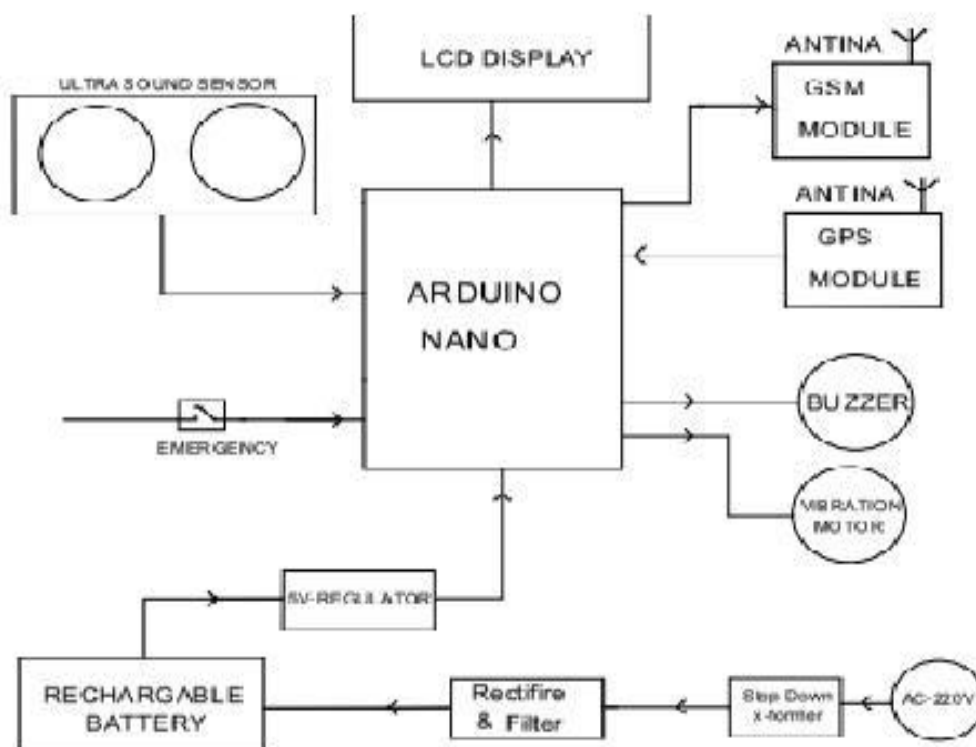## 5.2 Block Diagram

Figure 5.1: Basic Block Diagram of GSM Based blind stick with gps tracking system

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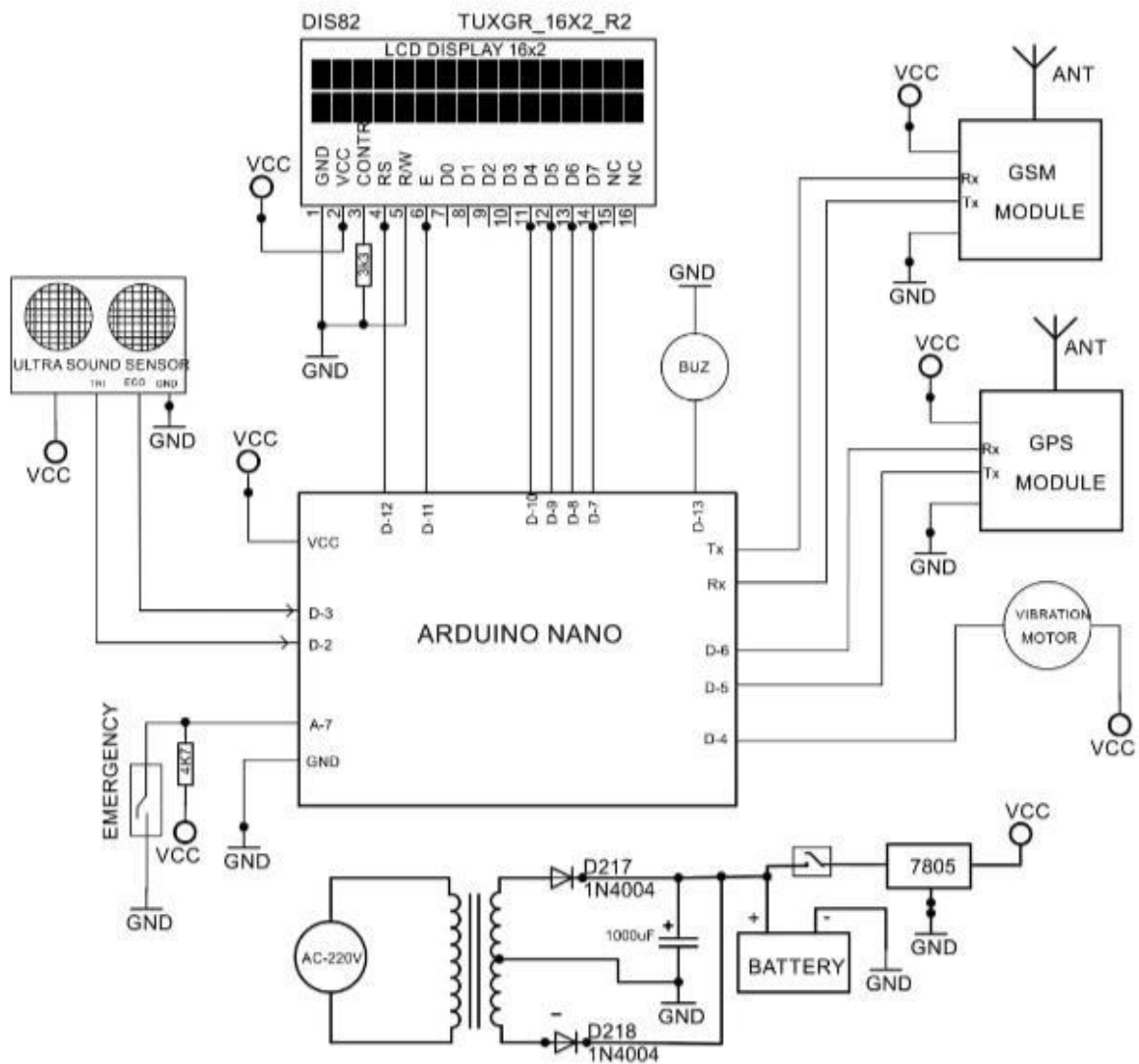
5.3 Circuit Diagram

Figure 5.1: Circuit Block Diagram of GSM Based blind stick with gps tracking system

5.4 Working Procedure

We know that in any system power is very important. Nothing works without power. We used 12V battery as power source in this project .At first we converted 220V AC supply using step down transformer and we are getting 12V (AC) in secondary. Then to AC to DC we used full wave bridge rectifier. We used two diodes D43, D44 (1N4004) for this rectification. Then we used a capacitor (1000uF) to convert pulsating DC to pure DC. Actually it is convert it is a filtering capacitor. We used that output which we got from the capacitor to charge the battery. We used power switch instead of giving the voltage that we got from the battery to the Auduino nano . Power will come to the Arduino nano from the switch. We know microcontroller or Digital IC need 5V to operate. To convert this 12V to 5V we used Regulator IC (7805). We are using 2 types of pin analog and data pin.We are use Arduino Nano D7,D8,D9,D10,D11 pin using for LCD display. Ultrasonic sensor detect the object arduino nano D2,D3 pin. Emergency switch using arduino nano analog pin A7.Vibration motor using pin D4.GSM module connection with arduino Tx,Rx pin,GPS module connection another pin D5,D6.Buzzer are connection arduino pin D13 give alarm.

5.5 Implementation

The circuit diagram was build and the device was successfully complete and accurate output show in the LCD display. According to program CODE the device was is sending Ultrasonic sensor and arduino nano, GSM and GPS system.

Figure 5.3: Final Project Outlook

5.6 Summary

We can find here the block diagram, circuit diagram and project output diagram and understood clearly .The circuit diagram was built and the device was ultrasonic sensor, ,Arduino nano ,resistor ,capacitor and diode, IC etc .According to program CODE the device was sending data shown in the LCD display.

CHAPTER 6

RESULT AND DISCUSSION

6.1 Result

Finally we are Properly connection do this project and we gate accurate result and output such as ,ultrasonic sensor are work sensing the object. A blind people face a problem then push button click and GSM module are send a sms.We are use GPS(Global position system) properly work and accurate give me information. Finally our project tested and shown below.

6.2 Advantage

- Main advantage of this project is safely will be walk street by stick without human help.

- When the blind person face she problem than push button click and her family member will gat a sms she facing problem and easily find out her position by GPS .

- We can easily make this project and cost is very low.

- This is one of the gps projects for blind which is very easy to install and easy to use. Partially sighted person can be immediately tracked using the projects for blind people.

6.3 Applications

There are numerous Applications of GPS based tracker for Blind individual utilizing GSM innovation, not many of them are recorded underneath:

1) This undertaking can be utilized for Blind individual.

2) GPS for daze individual undertaking can likewise be utilized for following outwardly hindered individuals, senior residents, old individual in our home.

3) This project can also be used for tracking senior citizens, elderly person in our home.

6.4 Cost Estimate

Equipment Name	Price(Taka)
LED	12
Glugun	150
Switch	10
Varo Board	200
Capacitor	20
Variable Resistance	10
Voltage Regulator	15
Resistance	50
Diode	20
Wire	60
Arduino Nano	350
LCD 16*2	120
Transformer	150
DC Battery	90
Transistor	5
GPS	450
GSM	600
IC7805	70
Ultrasonic Sensor	250
Transistor	30
Total	2662 Taka

Table 6.1: Cost Estimate

6.5 Discussion

The project aims safely walk blind people on the street. When the blind people walk the street by help use stick. From some limit distance of object than automatic create buzzer alarm than he understand front side is wall, tree,Poll etc. Blind people move left or right side lessening no buzzer than safely walk the road. When the blind people face any problem than emergency button push and automatic send sms get her family and position tracking by GPS module.

CHAPTER 7

CONCLUSIONS

7.1 Conclusion

The project is successfully developed and met the stated objectives. If we implement very successfully reduce road accident for blind people, Life easier and comfortable. These system provide the blind people safety and security .In this project, we develop a general purpose of safely walk of street by stick and without human help.

7.2 Future Scopes

- IOT and Wifi Based blind stick .
- Every hour automatic notification system.
- Arduino nano replace to raspberry pi use.

7.3 Limitations of the Work

- The working procedure of this project is very easy but we are facing some limitation for doing this project. Such as coding problem, program writing, connecting to PCB board, commend following etc.

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APPENDIX

```
#include <LiquidCrystal.h>
#define BUZ 13
SoftwareSerial gpsSerial(5, 6);
LiquidCrystal lcd(12, 11, 10, 9, 8, 7);
Vibration Morot(4)
Emergency (A7)
const int trigPin = 2;
const int echoPin = 3;
int distance;

float lattitude, longitude;
TinyGPSPlus gps;

String number = "+8801738251455";
void setup()
{
Serial.begin(9600);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
pinMode(BUZ, OUTPUT);
pinMode(Morot,OUTPUT)
pinMode(Emergency,INPUT)
lcd.begin(16, 2);
lcd.print("  Gsm Network");
lcd.setCursor(0, 1);
lcd.print("Searching");
{
lcd.print(".");
delay(500);
}
Serial.println("AT+CMGF=1");
delay(1000);
Serial.println("AT+CNMI=2,2,0,0,0");
delay(1000);
Serial.println("AT+CMGL=\"REC UNREAD\"");
```

```
gpsSerial.begin(9600);
delay(2000);
lcd.clear();
}
////////////////////////////////////////////////////////////////
////////////////////////////////////////////////////////////////
void control()
{
if(distance > 100)
digitalWrite(BUZ, LOW);
if((distance > 70) && (distance < 100))
{
digitalWrite(BUZ, HIGH);delay(50);digitalWrite(BUZ, LOW);delay(50);
delay(500);
}
if((distance > 50) && (distance < 70))
{
digitalWrite(BUZ, HIGH);delay(50);digitalWrite(BUZ, LOW);
delay(500);
}
if(distance < 50)
{
digitalWrite(BUZ, HIGH);delay(50);digitalWrite(BUZ,
LOW);delay(50); delay(500);

digitalWrite (MOTOR, HIGH);delay(50);(MOTOR,
LOW)delay(50); }

////////////////////////////////////////////////////////////////
void readSensor()
{
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
```

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```
distance= duration*0.034/2;
}
/////////////////////////////////////////////////
void disp()
{
//lcd.clear();
//digitalWrite(BUZ, LOW);
if(cnt2>5)
{
lcd.setCursor(0, 0);
lcd.print("LAT :"); lcd.print(lattitude, 6);
}
else
{
lcd.setCursor(0, 0);
lcd.print("LONG:"); lcd.print(longitude, 6);
}
Serial.print("Distance: ");
Serial.println(distance);
lcd.setCursor(0, 1);
lcd.print("Distance:");
lcd.print(distance);
lcd.print("cm  ");
}
/////////////////////////////////////////////////
void SendMessage()
{
Serial.println("AT+CMGF=1");
delay(1000);
Serial.println("AT+CMGS=\"+8801738251455"\r");
delay(1000);
String SMS = " SYSTEM READY..";
Serial.println(SMS);
Serial.print(" SYSTEM READY..");
delay(100);
}
```

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```
/////////////////////////////////////////////////////
void SendMessage1()
{
Serial.println("AT+CMGF=1");
delay(1000);
Serial.println("AT+CMGS=\" +8801738251455"\r");
delay(1000);
String SMS = "GSM Received the SMS";
Serial.println("Location");
Serial.print("LAT :"); Serial.print(lattitude, 6);
Serial.print(" LONG:"); Serial.print(longitude, 6);
delay(100);
Serial.println((char)26);
delay(1000);
}
/////////////////////////////////////////////////////

void GPS()
{
while (gpsSerial.available() > 0)
{
gps.encode(gpsSerial.read());
}
if (gps.location.isUpdated())
{
Serial.print("LAT="); Serial.println(gps.location.lat(), 6);
Serial.print("LONG="); Serial.println(gps.location.lng(), 6);
lattitude = gps.location.lat();
longitude = gps.location.lng();
}
}
/////////////////////////////////////////////////////////////
void BUZ()
{
digitalWrite(BUZ, HIGH);delay(50);digitalWrite(BUZ, LOW);delay(50);
}
```