



e-ISSN: 2278-8875
p-ISSN: 2320-3765

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 10, Issue 6, June 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.282

9940 572 462

6381 907 438

ijareeie@gmail.com

www.ijareeie.com



Ultrasonic Blind Stick with GPS Tracking System

¹Dr.S.Venkatesulu, ^{2*}A.Aswathy, ³G.Manoj Sai Kumar, ⁴Akash Ghantasala, ⁵M.Alekhyia

¹Associate Professor, Department of Electronics and Communication Engineering , St. Peter’s Engineering College, Hyderabad, Telangana, India

^{2,3,4,5}UG Student, Department of Electronics and Communication Engineering, St. Peter’s Engineering College, Hyderabad, Telangana, India

ABSTRACT: This paper describes a Blind Ultrasonic Stick with location tracking System using GPS and GSM for low vision people. Normally, people with low vision use a cane to find the obstacles on ahead of them. The objective of our project is to add a navigation tool to the cane such that dim sighted person can walk independently without the need for assistance. So, to upgrade the current mechanism we have implemented this project. Therefore, the upgraded stick consists of ultra-sonic sensor, a microcontroller, and a buzzer. In this, obstacle detection ahead of a person is performed by an ultrasonic sensor. An intimation is given to the person through a buzzer. In this, we also use ‘Global Positioning System’ and ‘Global System for Mobile Communication’ units to know the accurate position of the person in any condition. This model is not only convenient but also economical for dim sighted people.

Keywords: Ultrasonic sensors, Arduino, GPS and GSM units, Buzzer.

I. INTRODUCTION

A survey was conducted by World Health Organization in 2017, according to the survey, it is estimated that there are 327 billion people in world with impairment of vision, among them 36 billion are blind and 258 billion are with low vision. In olden days, blind people used stick to find out obstacles ahead of them. Therefore, this system design will help blind people to avoid obstacles and help to get the exact location of them. From the study of previous systems, we have enhanced a new system by overcoming the disadvantage of the previous system. In the proposed system we use an ultrasonic sensor to detect the obstacle based on ultrasonic waves without touching it. Data after detection of obstacle is sent to pic microcontroller which processes and calculates the distance from the obstacle. It is also used to send a signal based on distance between obstacles to buzzer. GPS unit is attached to know locality of user. The GSM module sends SMS to the number which is stored in microcontroller in case of any emergency.

II. LITERATURE SURVEY

S. Chew [1] in the year 2021 has come up with a smart white cane, so called as Blindspot that combines global positioning system technology, an ultrasonic sensor and social networking to help dim sighted people to travel in public locations. The GPS technology finds the location of obstacle and alerts person to avoid obstacle by using a sensor. But Global Positioning System was not up to the mark in detecting obstacle’s position.

S. Gangwar [2] proposed a model of smart stick for the blind in 2011 which gives beforehand intimation of obstacles using IR sensor. After identification, stick alerts the person using vibrator. However, stick is focused on detecting obstacles and it doesn’t provide any assistance in emergency situations. In this, sensors are not that efficient as they can detect only nearest obstacles.



Rohit Seth [3] designed a smart stick for blind people with a similar structure i.e., light in weight and very easy to handle. With the help of a transducer, detection the obstacles are being done. The user gets an alert by prerecorded sounds and a vibrator. This vibration is indicated based on the closeness of an obstacle to the user.

Benjamin et al [4] in the year 2011, designed a smart stick with the help of laser sensors for obstacle detection and down bridle. A high pitch beep sound is given by using a microphone for obstacle detection purpose. This stick is used only for detecting the object and cannot give any psychological support. This proposed system only has obstacle detection without any assistance to give directions.

Shruti Dambhare and Sakhare [5] in the year 2011, developed an smart electronic travel stick for visually impaired people with an efficient navigation aid to provide information about the environment around the user by giving a sense of artificial vision which was not that efficient.

III.PROPOSED SYSTEM

In the proposed system, there are two units attached to the smart stick which are transmitter and receiver units. The information is provided to the user by the system which has an obstacle detecting ultrasonic sensor aided with GPS and GSM units. This sensor acts as a microphone which transmits the ultrasonic sound in the form of a wave having a frequency range of 20kHz, which is also defined as inaudible sound with high frequency for human. In order to transmit a signal and receive its echo, a single transducer is used by the sensor. Based on the estimated distance the intimation is given to the user from the buzzer sound.

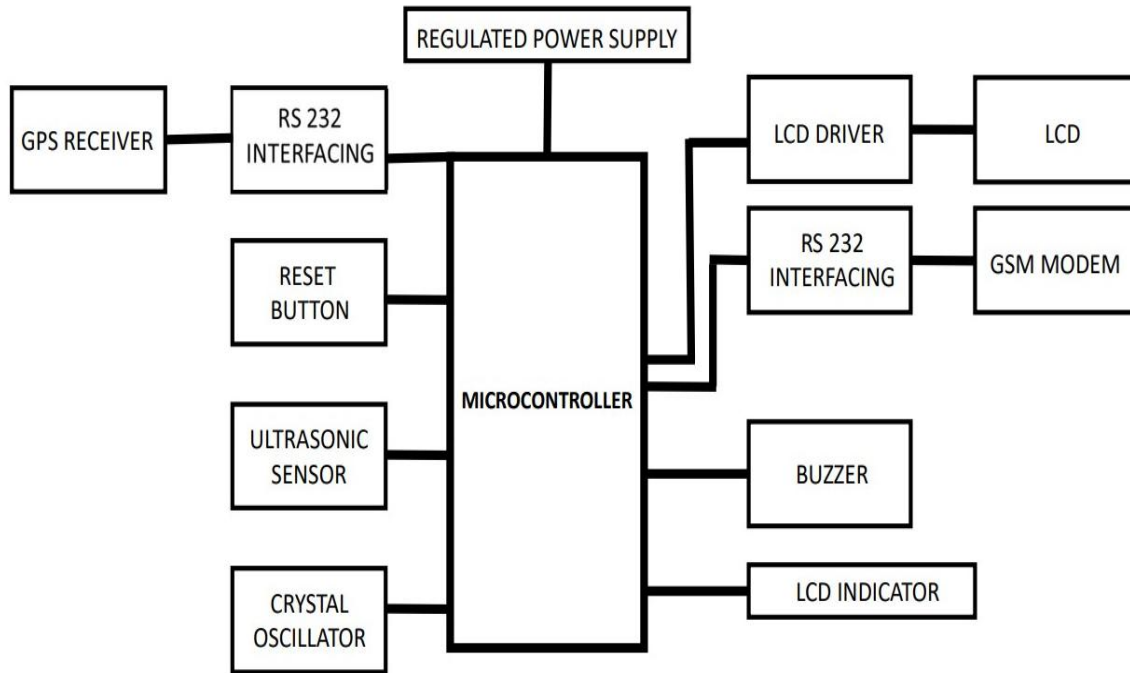


Fig.1 BLOCK DIAGRAM OF PREFERRED SYSTEM

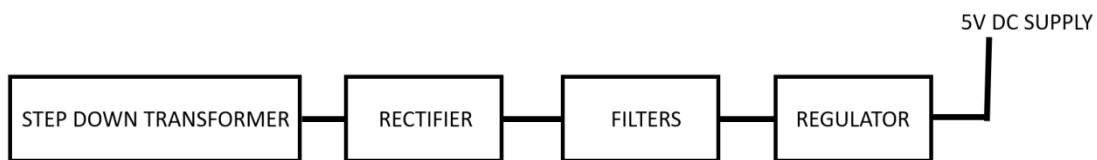


Fig.2 BLOCK DIAGRAM OF POWER SUPPLY



GPS AND GSM Technology

The GPS receiver decides the position by the measure of signal’s travel time to reach its location from least possible four satellites and provide information in the form of longitude position, latitude position and altitude position. By using increased number of satellites, we can get the precise location of the user with the stick.

This location can be shared through message by using GSM module. This module is interfaced with RS232 which allows to connect pc and microcontroller.

LCD display

We use LCD display so as to show the output of longitude and latitude values tracked by GPS and GSM units. Here, even the distance between user-obstacle is also displayed. Without display, it would be difficult to show the outputs of the system.

Pin No.	Name	Description
Pin no. 1	VSS	Power supply (GND)
Pin no. 2	VCC	Power supply (+5V)
Pin no. 3	VEE	Contrast adjust
Pin no. 4	RS	0 = Instruction input 1 = Data input
Pin no. 5	R/W	0 = Write to LCD module 1 = Read from LCD module
Pin no. 6	EN	Enable signal
Pin no. 7	D0	Data bus line 0 (LSB)
Pin no. 8	D1	Data bus line 1
Pin no. 9	D2	Data bus line 2
Pin no. 10	D3	Data bus line 3
Pin no. 11	D4	Data bus line 4
Pin no. 12	D5	Data bus line 5
Pin no. 13	D6	Data bus line 6
Pin no. 14	D7	Data bus line 7 (MSB)

Fig.3 LCD Pin Diagram

Ultrasonic sensor

We use this sensor for obstacle detection as this sensor can convert the sound wave type signals to electrical signals. With this kind of functionality, obstacles can be detected on the basis of pulse transmission and echo reception.

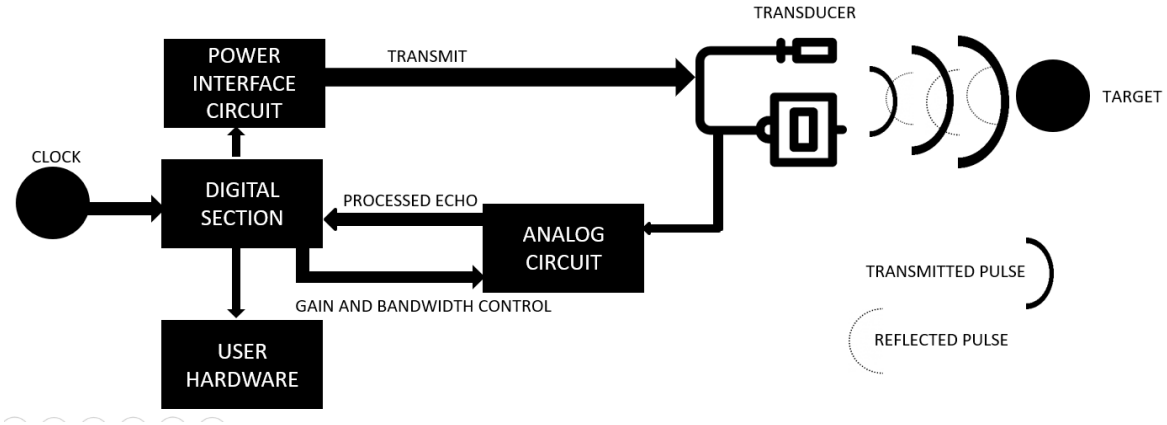


Fig.4 BLOCK DIAGRAM OF ULTRASONIC SENSOR

PIC Microcontroller

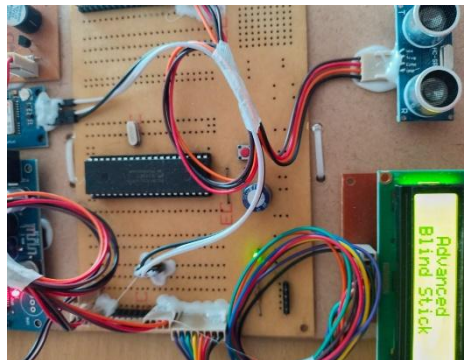
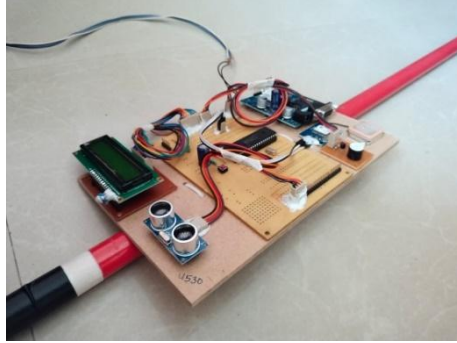
It has clock sources which are optional. It is a low power, mid-range crystal. It has timers which are programmable. It consists of independent interrupt sources up to 12.

Memory Type	Flash
Program Memory K Bytes	32
EEPROM Data Memory	256
RAM	1536
I/O Pins	36
Pin count	40
Max. CPU Speed MHz	40
Internal Oscillator	8 MHz
Temperature Range	-40 to 125

Pin diagram of Microcontroller.

IV. EXPERIMENT RESULTS

In our project we are able to track the user location by using active GPS tracking system and able to share the location of user to the registered mobile phone. In this every component and modules have been placed carefully and we are also using an advanced IC in our system for more efficiency. Buzzer alert is successfully tested. For a minimum distance, buzzer alert is activated and is functioning properly.



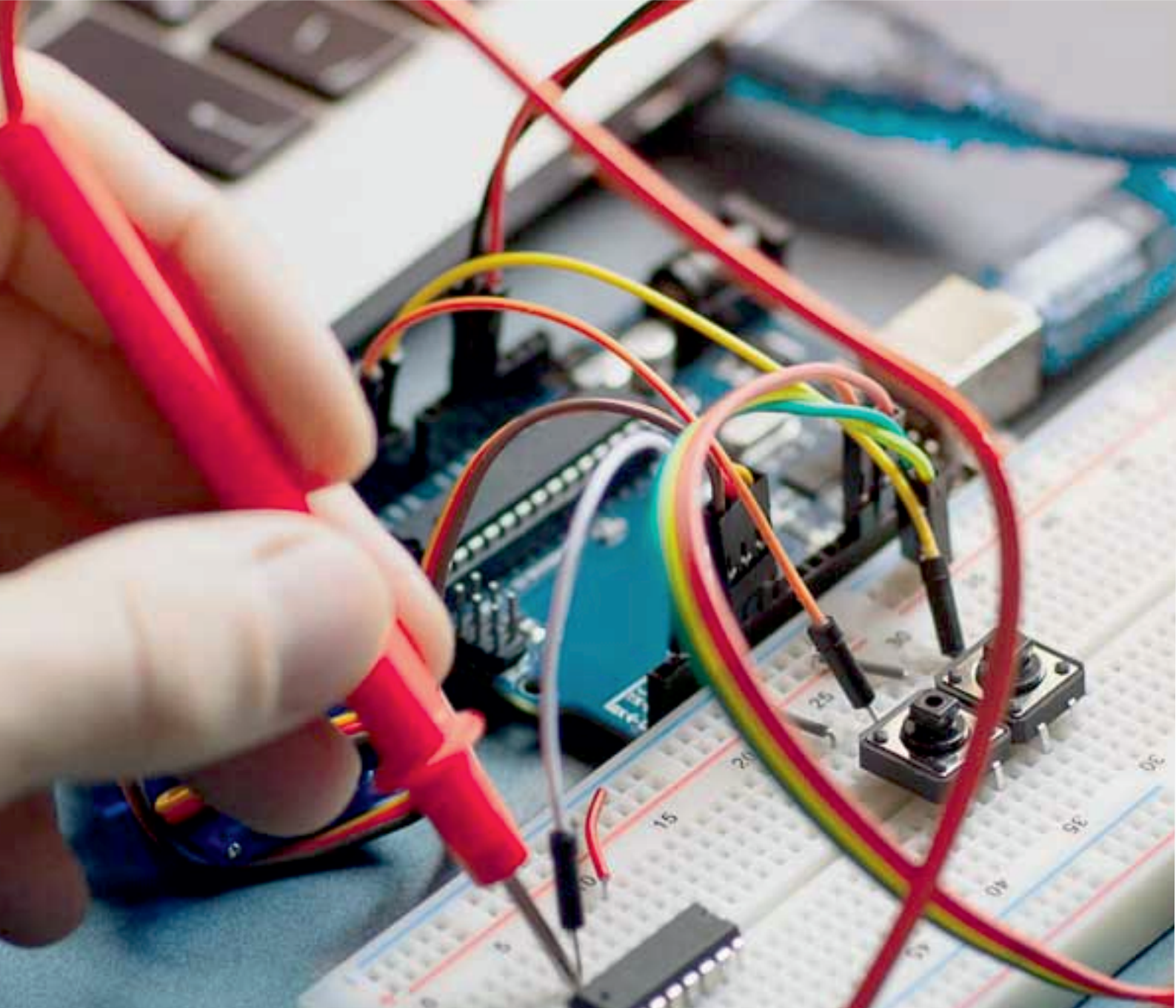
WORKING MODEL OF KIT

V.CONCLUSION

The user was able to travel efficiently in public locations with the help of the stick as it contains buzzer alert. In any situation, user's location detection can be done with real time active global positioning system module. The latitude and longitude values are communicated through a mobile phone via sim card placed in the GSM module, thus ensuring the safety of the person. In this way our project has been successfully designed and implemented.

REFERENCES

- [1]“The Smart white Cane for Blind” by Selene Chew at ‘National University of Singapore’ in the year 2012.
- [2]On Sept 26th in the year 2011, a model “The Smart stick for Blind” proposed by Shantanu Gangwar, New Delhi.
- [3] Rohith Seth designed “Smart White Cane” which was elegant and economical.
- [4] “Smart Stick” by Benjamin along with team members, at Company Researches of Bionic Instruments, 2011.
- [5] Shruti Dambare along with her prof. A. Sakhare, “Smart Stick for Blind” with detection of obstacle, artificial vision and GPS real time assistance. Published under Computer Applications international journal No. 1, 31 – 33, 2011.



INNO  **SPACE**
SJIF Scientific Journal Impact Factor
Impact Factor: 7.282



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

 **9940 572 462**  **6381 907 438**  **ijareeie@gmail.com**



www.ijareeie.com

Scan to save the contact details