

# VOICE BASED BUS IDENTIFICATION SYSTEM FOR VISUALLY CHALLENGED PERSONS

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**ABSTRACT:**In bus stops, blind peoples feel very difficult to identify their particular bus. They need other's help to identify the bus. This project is developed for the visually challenged people, old age people & uneducated people to identify their bus through voice alert system using 8051 microcontroller. It consists of two modules called bus module and bus stop module. The bus module consists of power supply, RF transmitter and zigbee transducer. The bus stop module consists of power supply, zigbee transducer, microcontroller unit, voice control playback IC, Driver circuit and RF transmitter. The information about the bus will be given to the bus stop module through wireless communication. Zigbee in the receiver part connected in the bus stop module receives the data and searches for the information of particular bus in zigbee. The microcontroller will send the information about the bus to the voice control playback IC. Thus the blind person hears the Bus information through the loud speaker available in the bus stop. This project is very useful for blind people to identify their bus in the bus stop. The microcontroller program is written in assembly language and the software used in this project to specify the purpose of microcontroller is keil-C.

## I. INTRODUCTION

The wireless technology plays an important role in this trendy world. The purpose of this paper is to help un-educated people, visually impaired persons and the old age people to get their buses safely without any guidance from other people in the bus stop.

For visually impaired people, outdoor pedestrian mobility is very difficult and often dangerous. The visually impaired commonly rely on a cane or walking stick and a guide dog to assist them in efficiently reaching a desired destination without harm. However, this approach is successful only if the majority of the path to the destination is already known to the blind (or to the guide dog).

Buses play an important role for the transportation. For a majority of blind and visually impaired persons, public transport is the only viable mobility option to seek social connectivity. Those people live in a limited environment and have difficulty to sense what happen around them, which reduces their activities in several fields, such as education and transportation since they depend only on their own intuition. Hence, we need to make their lives more comfortable by introducing a system that helps them enjoy transportation services independently and freely like ordinary people, without relying on others. Thus to help the visually impaired people and to make them to gain confidence to move around freely.

## II. OVERVIEW

The system consists of two modules: the bus module and the bus stop module. The bus module consists of power supply, zigbee transmitter, RF transmitter with antenna. The bus stop module (receiver part) consists of power supply, zigbee receiver, 8051 microcontroller, voice control playback IC, driver circuit and a loudspeaker. The transmitter and the receiver part will communicate wirelessly. The 8051 microcontroller used in this system is used to reduce the size of the entire module and the program size is also reduced upto 30%. The bus module generates electromagnetic waves with the RF transmitter and RF antenna. Those waves are recognized by the receiver kit RF antenna and the RF receiver. The information about the bus will be send by the zigbee from the transmitter part. The information from the transmitter is given to 8051 microcontroller which is send to voice control

playback IC and then announced in the loudspeaker to help the uneducated, visually impaired and old age people. The existing system is useful only for the blind by using RFID technology along with the ear phone for the visually challenged persons. The emerging technology is used in this module to help the people to project themselves in a better way without any others help.

### III. EXECUTION AND WORKING:

The working of the product is split two parts:

1. Transmitter part at bus module.
- 2.Receiver part at bus stopmodule.

#### 3a.Transmitter part at bus module:

Application of first step is to intimate at RF signals by using RF antenna transmitting signal continuouslywith the help of RF transmitter. Power supply is given to the zigbee, RF transmitter and Antenna.

#### ZIGBEE:

ZigBee is used to store the information of bus timings and routes in voice based bus identification system for blind.Its low power consumption limits transmission distances to 10–100 meters( line-of-sight), depending on power output and environmental characteristics.



Fig 1-Zigbee module.

ZigBee devices can transmit data over long distances by passing data through a mesh network of intermediate devices to reach more distant ones. ZigBee is typically used in low data rate applications that require long battery life and secure networking (ZigBee networks are secured by 128 bit symmetric encryption keys.) ZigBee has a defined rate of 250kbit/s, best suited for intermittent data transmissions from a sensor or input device.

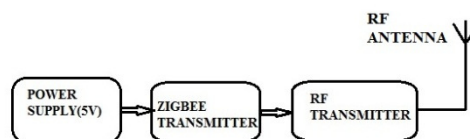


Fig 2-The bus module.

#### RF MODULE:

An RF transmitter module is a small PCB sub-assembly capable of transmitting a radio wave and modulating that wave to carry data.

### 3b.Receiver part ( busstop module):

The Receiver module is fixed to the bus stop and it consists of Voice control playback IC(APR33A3),Driver circuit(DC547),8051 Microcontroller,Loudspeakerand Zigbee,<sup>[2]</sup>.

The information about the bus is obtained from the transmitter.The signal is given to the Zigbee receiver circuit and those signals are matched with the signals in the receiver, then the information about the bus is given to microcontroller. If the microcontroller does not give any information to the voice control playback IC then a driver circuit is used.

A driver circuit is an electrical circuit or other electronic component used to control another circuit or component, such as a high-power transistor, liquid crystal display (LCD), and numerous others.

Driver circuits are usually used to regulate current flowing through a circuit or are used to control the other factors such as other components, some devices in the circuit.

Voice control playback IC is used to record the voice about the information of the bus and play it back later whenever required.

Loudspeaker is used to announce the information at their peoples at receiver part.Power supply is given power to the all the products in the module.

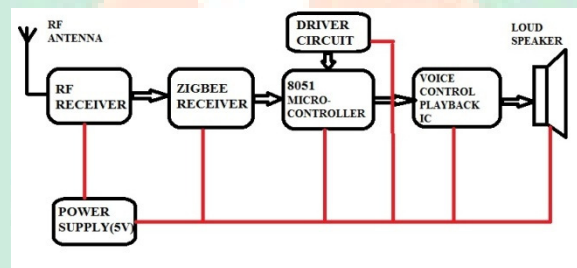


Fig 3- The bus stop module.

#### POWER SUPPLY:

A power supply is an electronic device that supplies electric energy to an electrical load. The primary function of a power supply is to convert one form of electrical energy to another,<sup>[3]</sup>.

#### RF MODULE:

An RF module is a small electronic device used to transmit and/or receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wirelessly. An RF receiver module receives the modulated RF signal and demodulates it,<sup>[1]</sup>.

#### 8051-MICROCONTROLLER:

The 8051 architecture provides many functions in a single package. One feature of the 8051 core is the inclusion of a boolean processing engine which allows bit-level boolean logic operations to be carried out directly and efficiently on select internal registers and select RAM locations. This feature helped cement the 8051's popularity in industrial control applications because it reduced code size by as much as 30%.



Fig 4-Pin diagram of 8051 microcontroller.

## DRIVER CIRCUIT:

A driver is an electrical circuit used to control another circuit, such as high power transistor, liquid crystal display and numerous others,<sup>[3]</sup>.

## VOICE CONTROL PLAYBACK IC:

Voice control playback IC operates at a voltage range of about 3V-5V. It is a single chip, high quality audio/voice recording & playback solution. It is a user friendly IC, which is easy to use, program and development systems are not required.

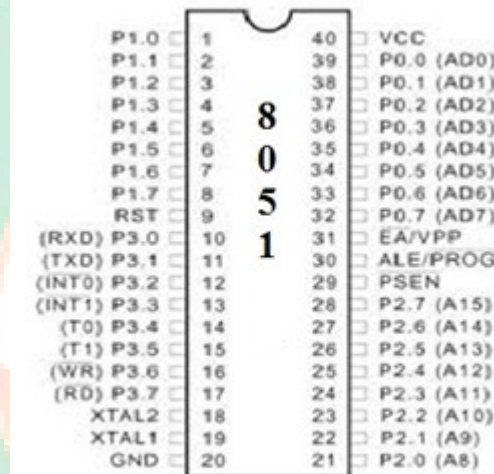


Fig 5- Voice control playback IC.

## IV. CONCLUSION

An interactive wireless communication aid system for the visually impaired to use city buses was developed in this project. The use of Zigbee will store the information and loud speaker will announce the arrival of the bus. Result of this project indicates that this system could help users to successfully board their desired buses, using the interactive communication modules.

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