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Bus Announcement and Display System using Wireless Communication

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Abstract: ***Many technologies have recently made noticeable changes in several domains. The main aim of this project is to display and announce the bus route information in bus stops using some of these technologies such as Radio Frequency Communication and wireless network. Furthermore, arduino system architecture and an appropriate design for its components will be used. This system will allow people to get information about buses with the help of a display device and an audio device for announcement of bus information and a tactile interface through a wireless sensor networks between the transmitter and the receiver. People will have the opportunity to get information about bus arrival information in both audio and visual format. The motivation behind this project is that buses are vital in enabling people to participate fully in society, access to facilities and services and helpful for both blind and deaf persons***

Keywords: Arduino Uno, Transmitter, Receiver, Speaker.

I. INTRODUCTION

India is one of the most populous Country in the world and is a fastest growing financial prudence. Yet a few people own a personal transport. People who own a personal transportation facility are not the concern. People who do not, haul their respective destinations via public transport like local buses. At bus stands everything is perfect from display to announcement system. Coming to small bus depots there is no such facility. The aim of this project is to bring all these facilities to bus depots which makes passengers aware of what's going on. Display boards at the stop display the bus arrival time when there is no bus around. When there is a bus approaching the bus number will be announced and displayed as well, so everyone including blind and deaf will be informed.

Flow Chart

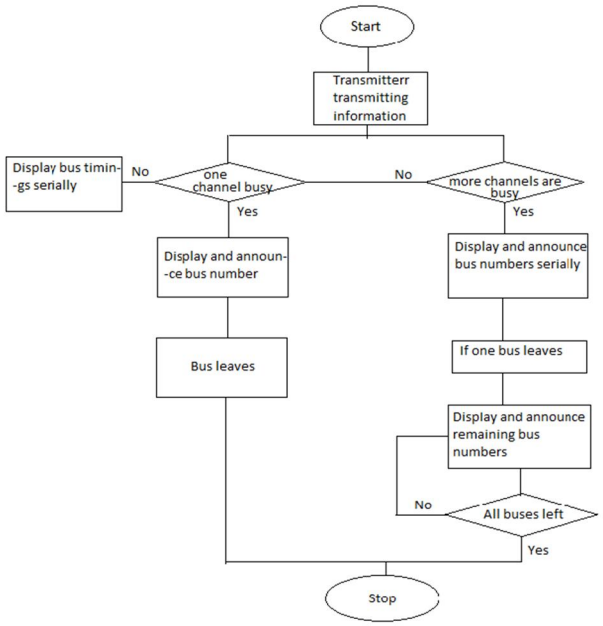

Fig. 1 Flow chart for bus announcement and display system.

In this paper we have bus announcement and display system in bus stops using Arduino Uno.

II. COMPONENTS

A. Arduino UNO

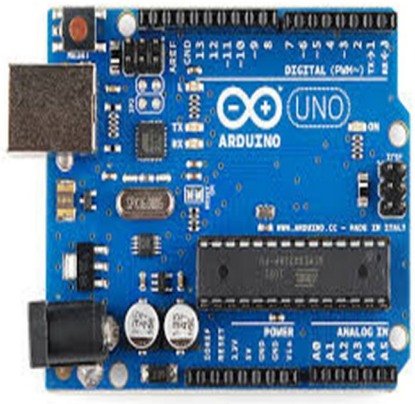

Fig. 2: Arduino Uno

The Arduino Uno is a microcontroller board based on the ATmega328. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs), a 16 MHz resonator, a USB connection, a power jack, an in-circuit system programming (ICSP) header, and a reset button.

B. GHz Transciever(nRF24L01)

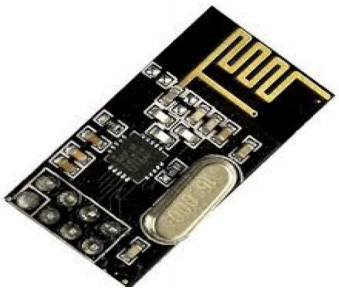

Fig. 3: Transceiver

This sensor is very sensitive. So it is tied with some sort of covering to a finger tightly. This sensor makes the measurement of heartrate extremely easier.Heart rate monitors generally come in two types — either a wireless chest strap that sends data to a monitor worn on the wrist, or pulse monitor worn on the wrist that requires you to put your finger on a certain spot to take your pulse.Heart rate sensor monitors provide quick feedback on how strong you are working out so that you can make adjustments on requirements to get the more benefit from your exercise plan.

C. Power Amplifier(LM386)

Fig. 4: LM386

LM386 can be operated with battery and has a wide voltage range 5v-18v. Current draw is around 4mA, thus battery drains very slowly. Voltage gain is the range 20-200. Output is Self Centered quiescent Voltage. Low Distortion, Available in 8 pin DIP. This IC can be used in Radio Amplifiers, Servo drivers etc.

D. Arduino IDE

Fig. 6**:** Arduino-IDE logo

Node red is used as programming tool for hardware devices and APIs in the purpose of writing together and also for writing online services in new and interesting ways. As this node-red has a browser based editor, the flows can be wired together by using a wide range of nodes that are available in the palette which can be deployed to its runtime in a single click.

E. Speaker(8ohm 0.5watt)

Fig. 7**:** Speaker

The speaker used here is a very compact low power consuming and can be used in low power appliances.
The bus number is transmitted from bus side to the receiver side. Then the bus number is displayed serially on the monitor and announced simultaneously

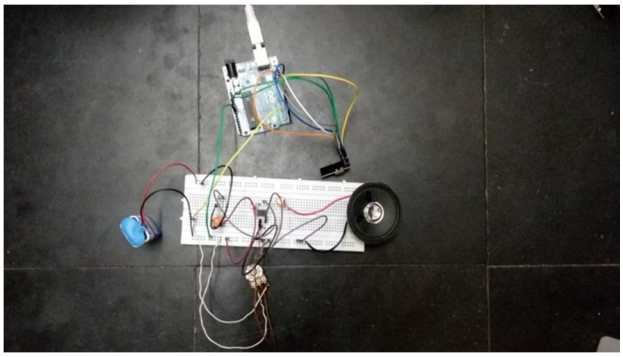

Fig. 8a: Experimental setup of bus stop

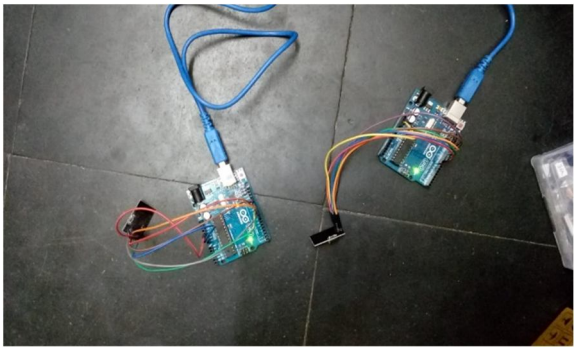

Fig. 8b: Bus 1 and Bus 2

This project is mainly concerned on the small bus depots spread around the city where there is no announcement and display of buses. When there is a bus approaching the stop the receiver starts sensing the data and sends it to the serial monitor, at the same time announcement of the bus will also happen. When there are no buses arriving to stop then display and announcement system remains idle. There are 2 buses used in this scenario whose numbers are 27 and 15. There are 3 test cases possible. In case1 if bus 27 is arriving to the stop, in case2 if bus 15 is arriving to the stop, in case3 if bus 27 and bus 15 are both arriving to the stop

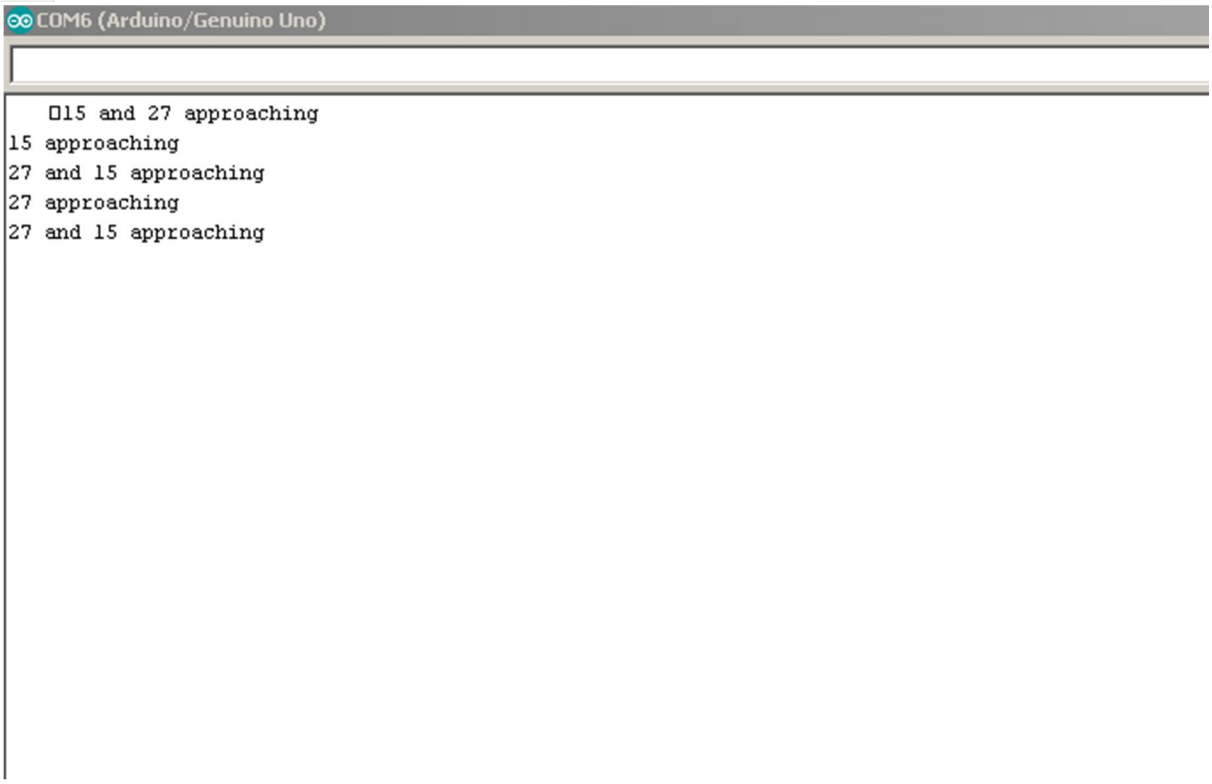

Fig. 9: Outputs for various test cases

III. CONCLUSION AND FUTURE WORKS

As a conclusion, this project had achieved the main objective stated earlier which is analyzing and implementing wireless communication; the radio frequency(RF) transmission in the bus announcement system. The prototype of this project is using the frequency of 2.4 GHz compared to range of about 3KHz to 300GHz of frequency which have been reserved for the RF theoretically. The sequences for this project have been developed using the programming in the Arduino. Further improvements can be made by implementing GPS live tracking system

IV. ACKNOWLEDGEMENT

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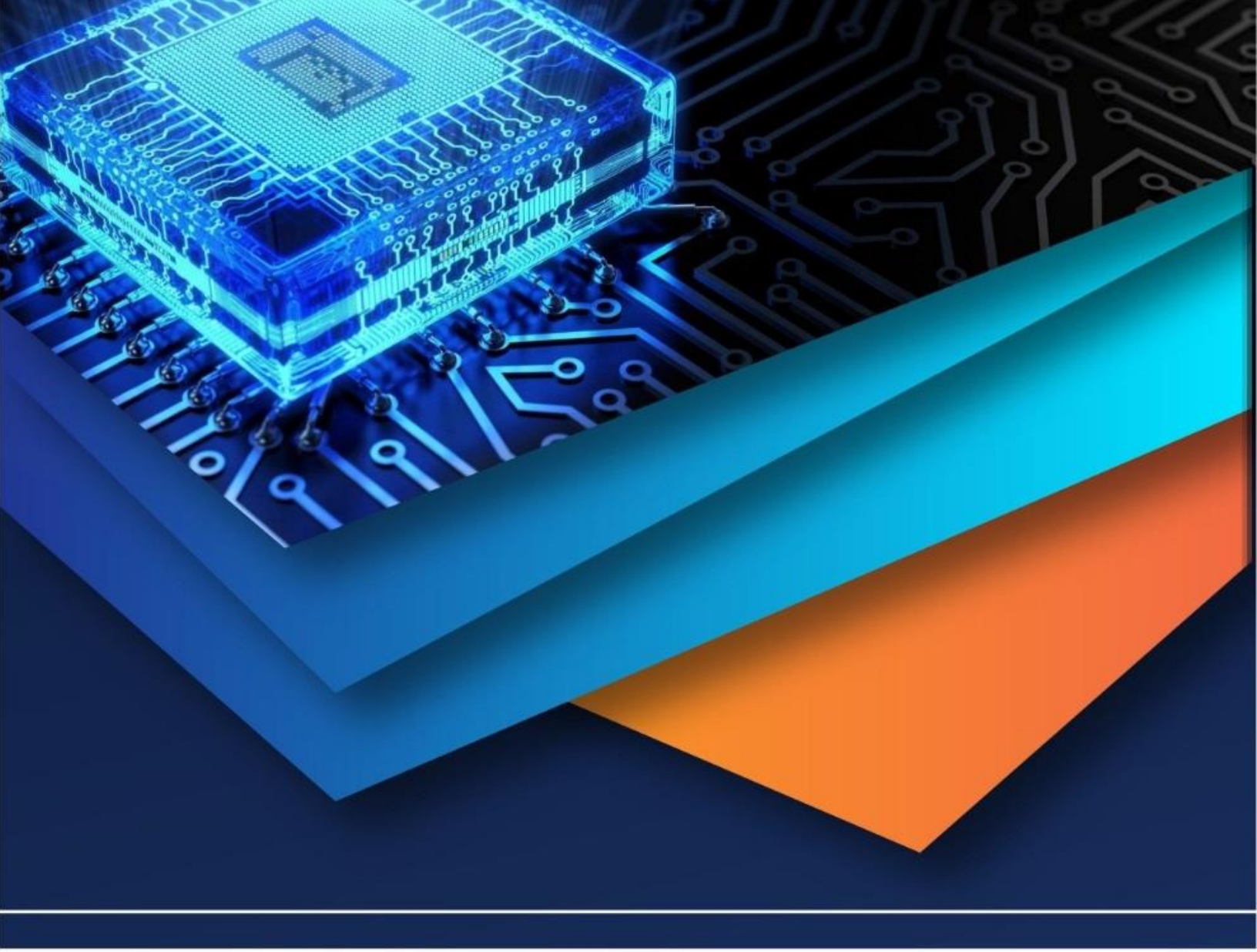

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