

# Wireless Notice Board Using Arduino Uno & Bluetooth HC-05 Module

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**Abstract** - The project is “Wireless Notice Board Using Arduino Uno & Bluetooth HC-05 Module” is a Bluetooth based wireless notice board developed using Arduino uno. It is controlled by an android device and will help us in displaying any message immediately without any delay just by sending a SMS which is better and additional reliable than the recent ancient manner of passing the message on notice board. This project can be used in schools, colleges, railway stations and many public places to convey the information and also make awareness of the emergency situations and avoid many dangers. Using HC-05 Bluetooth module operating environment can able to stand near the arduino uno and it usually acquire live data. This smart wireless notice board is very useful in real time application and the information is given through through keyboards using our fingers. Main advantage of this project is it saves more time and reduce the printing cost and also low power consumption.

**Keywords** - Arduino UNO, Bluetooth HC-05 Module, Half Breadboard, Jumper wires. LCD Display(16 x 2), Resistor(1K ohm), Smart Phone.

## Objective:

The project aim is to design an LCD based scrolling message display controlled from an android mobile phone. This project makes use of Bluetooth technology to communicate from android phone to LCD display board. This project is to develop a wireless notice board which is used for instant information display using LCD by using android Bluetooth module.

## I. INTRODUCTION

In this world Mobile Phones and related technologies are becoming more and more prevalent. Notice board are one of the widely used ones ranging from primary schools to major organizations to convey a message at large. A lot of paper is been used and which is later wasted by the organization. This in turn leads to a deforestation thus leading to a global warming. The full method may be delineate from the Transmitter and Receiver section. The Bluetooth module receives a message from the authorized mobile phone and the message is extracted from the Bluetooth module and is displayed on the LCD. For acknowledgement LCD display is used. The projected system “Bluetooth based Wireless bulletin Board exploitation Arduino” is reasonable, quick reliable and secured for any organization that must flow into notice often and scale reduce physical efforts. We are using Bluetooth technology. We can send notice from any location. This projected system during this project has many approaching applications in instructional establishment and organizations, crime interference, traffic management, railways, advertisements etc. Been user friendly, long vary

and quicker means of conveying information are major bolsters for this application. By using this proposed methodology, we can enhance the safety system and also make awareness of the emergency things and avoid several dangers.

## II. COMPONENTS REQUIRED

The design and development of this mini-project requires hardware and software tools as listed below.

### Hardware requirements:

- Arduino Uno
- Liquid Crystal Display (LCD) 16 x 2
- Half Bread Board
- Bluetooth HC-05 Module
- Pin Description
- Pair HC-05 and Smartphone
- Jumper Wires
- Resister (1K Ohm)

### Software Requirement:

- Arduino IDE
- Programming on Arduino

### Arduino Uno

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message and turn it into an output - activating a motor, turning on an LED, publishing something online.

You can tell your board what to do by sending a set of instructions to the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.



**Fig 1: Arduino UNO**

**LCD 16x2:**

An LCD (Liquid Crystal Display) screen is an electronic display module and has a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. The 16 x 2 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols. This LCD has two registers, namely, Command and Data.



**Fig 2: LCD 16x2**

Breadboards are temporary work boards for electronic circuits. The general shape of a breadboard is compatible with most breadboards, 24-gauge wire is used to connect circuits; solid wire, not stranded.



**Fig 3. Half Bread Board**

sometimes, kits may be available with various colours of fixed lengths to specifically fit breadboards. These are a nice convenience. Breadboard has sets of miniature sockets laid out on a 0.1-inch grid which will accept the manual insertion of component leads and tinned copper wire (TCW) links. It has rows of contacts inter connected in groups placed either side of the centre line of the board, where the integrated circuits (ICs) are inserted, giving multiple contacts on each IC pin.

**HC-05 Bluetooth Module:**

HC-05 Bluetooth Module is an easy-to-use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Its communication is via serial communication which makes an easy way to interface with controller or PC. HC-05 Bluetooth module provides switching mode between master and slave mode which means it able to use neither receiving nor transmitting data. Bluetooth serial modules allow all serial enabled devices to communicate with each other using Bluetooth.



**Fig 4. HC-05 Bluetooth Module**

**Pin Description:**



**Fig 5 Pin Description**

It has 6 pins,

1. **Key/EN:** It is used to bring Bluetooth module in AT commands mode. If Key/EN pin is set to high, then this module will work in command mode. Otherwise by default it is in data mode. The default baud rate of HC-05 in command mode is 38400bps and 9600 in data mode.

HC-05 module has two modes,

1. **Data mode:** Exchange of data between devices.
2. **Command mode:** It uses AT commands

which are used to change setting of HC-05. To send these commands to module serial (USART) port is used.

2. **VCC:** Connect 5 V or 3.3 V to this Pin.
3. **GND:** Ground Pin of module.
4. **TXD:** Transmit Serial data (wirelessly received data by Bluetooth module transmitted out serially on TXD pin)
5. **RXD:** Receive data serially (received data will be transmitted wirelessly by Bluetooth module).
6. **State:** It tells whether module is connected or not

*Pair HC-05 and smartphone:*

1. Search for new Bluetooth device from your phone. You will find Bluetooth device with “HC-05” name.
2. Click on connect/pair device option; default pin for HC-05 is 1234 or 0000.

After pairing two Bluetooth devices, open terminal software (e.g. Teraterm, Realterm etc.) in PC, and select the port where we have connected USB to serial module. Also select default baud rate of 9600 bps.

In smart phone, open Bluetooth terminal application and connect to paired device HC-05.

It is simple to communicate, we just have to type in the Bluetooth terminal application of smartphone. Characters will get sent wirelessly to Bluetooth module HC-05. HC-05 will automatically transmit it serially to the PC, which will appear on terminal. Same way we can send data from PC to smartphone

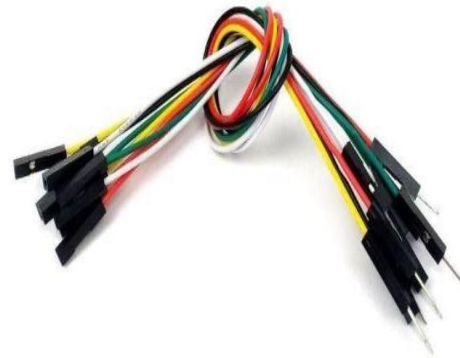
*Jumper Wires:*

Jumper wires are used to inter connect components perfectly. The resistance offered by these wires is up to 3 megaohms. There are three types:

- Female-Female (Fig 6)
- Male-Male (Fig 7)
- Male-Female (Fig 8)



**Fig 6 Female female Connector**



**Fig 7 Male female connector**



**Fig 8 Male-Male Connector**

*Arduino IDE:*

Before we start controlling the world around us, we need to set up the software to program our board.

The Arduino Software (IDE) allows us to write programs and upload them to our board. In the Arduino Software page, we will find two options:

If we have a reliable Internet connection, we should use the online IDE (Arduino Web Editor). It will allow us to save our sketches in the cloud, having them available from any device and backed up. We will always have the most up-to-date version of IDE without the need to install updates or community generated libraries .

If we would rather work offline, we should use the latest version of the desktop IDE.

The open-source arduino software (IDE) makes it easy to write code and upload it to the board. This software can be used with any arduino board.

### III. LITERATURE WORK

\* Related Work:

[1] Ramya R, Bavithra N, Priyanka M, “Wireless E-notice board exploitation Bluetooth technology” This paper explains E-notice board with the assistance of Bluetooth technology. This document deals with Associate in Nursing innovative rather a noteworthy manner of intimating the message to the folks employing a wireless electronic display panel that is synchronized exploitation the Bluetooth technology. This will help us in passing any message almost



immediately without any delay just by sending a SMS which is better and more reliable than the old traditional way of passing the message on notice board. This proposed technology can be used in colleges many public places, malls or big buildings to reinforce the safety system and additionally build awareness of the emergency situations and avoid several dangers.

Keywords: Bluetooth module, Arduino, 8x8matrix show, microcontroller, muti terminal.

[2] Sakshi Gaikwad, Tushar Ghodake, Sonali Patil, Riyaj Pathan, Amrut Kulkarni, “Bluetooth Based Wireless Notice Board using Arduino” Bluetooth based wireless notice board using Arduino will help us in passing any message before long with no delay simply by causation an SMS that is better and additional reliable than the old recent ancient manner of passing the message on notice board. This projected technology can be used in colleges, and many public places, to reinforce the safety system and additionally build awareness of emergency situations and avoid many dangers. This paper explains the E-notice board with the assistance of Bluetooth technology.

Keywords: Bluetooth module, Arduino, 160\*320mm, matrix display, Microcontroller.

[3] Abhaykumar Prajapati, Prof. Sohil Lehar, Prof. Ramesh Prajapati, Prof. Kaushik Prajapati “Bluetooth Controlled Notice Board Using Arduino” The project aim is to design an LED-based scrolling message display controlled from an android mobile phone. This project makes use of Bluetooth technology to communicate from android phones to LED display boards. This project is to develop a wireless notice board that is used for instant information display using LED’s by using android Bluetooth module.

### PROPOSED WORK

I) Design and Development: Block Diagram of Bluetooth based Wireless notice board using Arduino uno is shown in figure2.

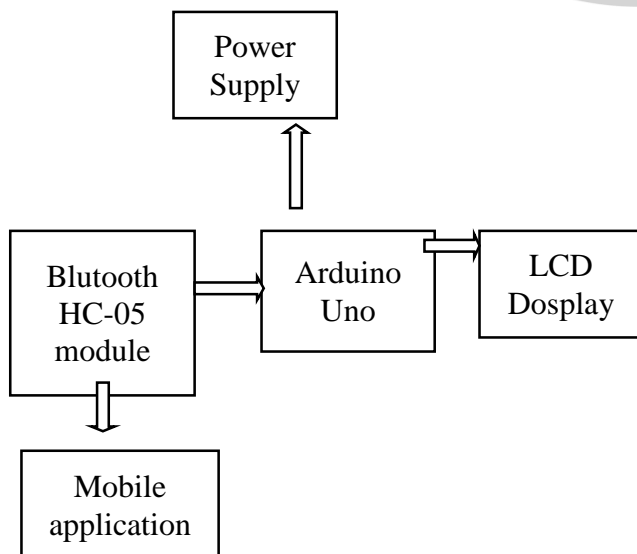


Figure9: Block Diagram

### II) Working:

In our project we use power supply, Arduino UNO, LCD display, Bluetooth HC-05 module, 1K Resistor (to limit the electric current in an electronic circuit), Half-Breadboard, Jumper wires, and mobile application. when uploading the program in Arduino UNO, we will offer them external power supply. because of that one functions of equipment’s measure on. At that point, we will pass the notice/SMS which we want using mobile. Then this notice/SMS will receive by Bluetooth. And by using Arduino this notice/SMS notice/SMS can show on digital board.

### CIRCUIT DIAGRAM

As per the circuit diagram we made circuit connection. After that we write the program in Arduino IDE software and we upload that program in Arduino UNO then all functions start to run with program. After uploading the program, then we need to pair Bluetooth HC-05 module with mobile. Using Arduino Automation mobile application send notice/SMS from mobile then this notice/SMS will receive Bluetooth and display on LCD module.

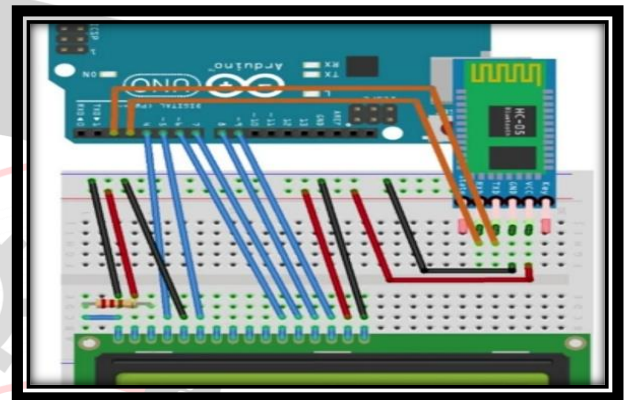


Figure 10 :Circuit Diagram

This proposed system used for many upcoming applications in educational institutions like schools, colleges and organizations, crime prevention, traffic management, railways etc.

Instead of microcontroller we have used Arduino UNO and in the place of LED matrix we have used LCD display.

### IV. RESULTS/OUTCOME



Figure 11 : Output 1



Figure 12: Output 2

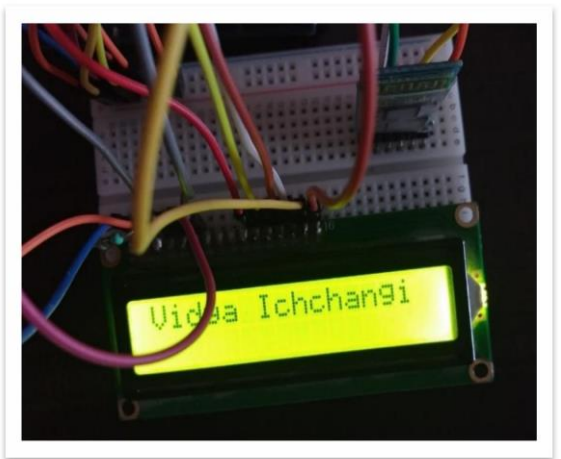


Figure 13: Output 3

**Output Table 1 :**

Number of Outputs	OUTPUT (Displayed Message)	Number Of Characters Displayed	Time taken to display a message
Output 1	Dayanand Jakkali	16	0.08 Seconds
Output 2	Sneha Ganjihal	14	0.05 Seconds
Output 3	Vidya Ichchangi	15	0.07 Seconds

**VII. CONCLUSION AND FUTURE SCOPE**

**Conclusion:**

As the technology is advancing every day the display board systems are moving from Normal hand writing display to digital display. Further to Wireless display units. This develops a photo type laboratory model wireless notice board system with Arduino and Bluetooth connected to it, which displays the desired message of the user through an SMS in a most populated or crowded places. Been user friendly, long range and faster means of conveying information are major bolsters for this application. By using this proposed methodology, the arduino board is able to eliminate the likelihood of any loose connection therefore we can easily dump the program into aeduno board.

This project has been executed successfully so the messages have been displayed on the LCD. Overall this project is very compact and minimum space has been utilized.

**Future Scope**

- 1) This proposed system has many upcoming applications in educational institutions and organizations, crime prevention, traffic management, railways, advertisements.
- 2) By Using this proposed methodology, we can enhance the security system and also make awareness of the emergency situations and avoid. □
- 3) Been user friendly, long range and faster means of conveying information are major bolsters for this application. □
- 4) By using this proposed methodology, we can enhance the security system and also make awareness of the emergency situations and avoid many dangers
- 5) This Proposed methodology save the lives of people in emergency situation by conveying the information fster and easily.

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