Voice Controlled Automation System

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Abstract:- Automation is now essential everywhere. It is easy to create sound, and is available in many forms (i.e.) Human speech, clap sound. Switching the devices mechanically would suffer some disadvantages. Our project is to control the home appliances such as fan, light, TV, etc., using human speech .The idea is that the MIC converts sound energy into electrical signal which is amplified and micro-controlled using arduino and then given to the relay circuit which switches the home appliances. We can use Bluetooth module or GSM system. External noise and fluctuations, may affect the output of this project but this can be overcome by using an android system using Bluetooth module which is more economical.

I. OBJECTIVES

The main objective of our project is home automation to help disabled persons in switching home appliances (turn-ON and turn-OFF home appliances). Besides, the ease of switching, this automation ensures user's safety.

II. INTRODUCTION

It is easier to operate the devices or appliances using voice command. Since the voice command is given through mobile phones we need an interlink between android and the electronic circuit. This process is done by the use of communication devices. For this purpose we have used bluetooth module HC- 05.
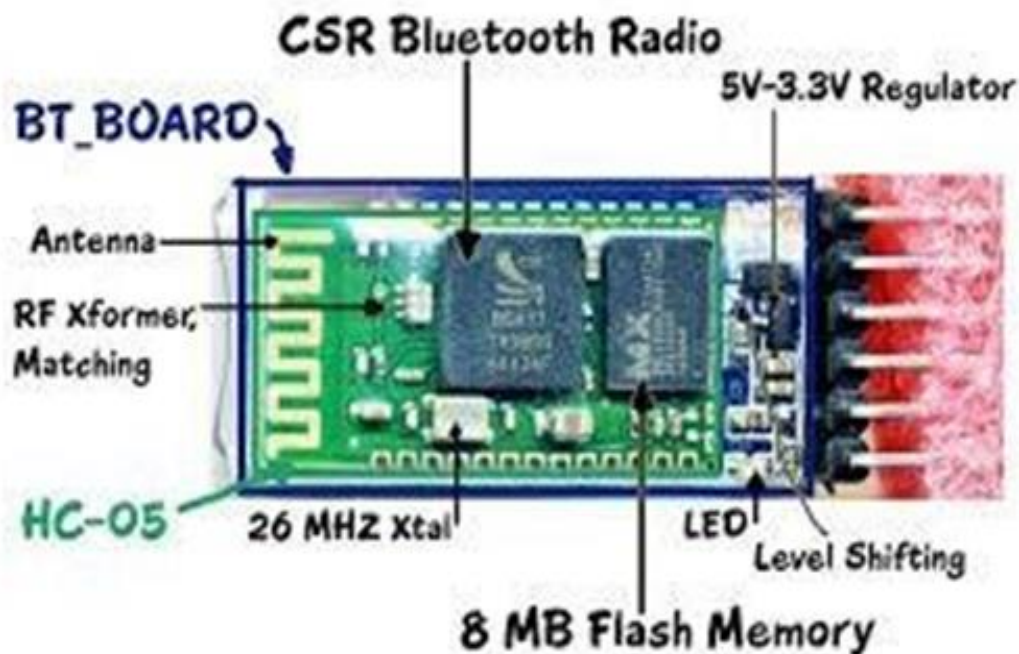

Fig 1:- Communication Device

III. CIRCUIT DIAGRAM

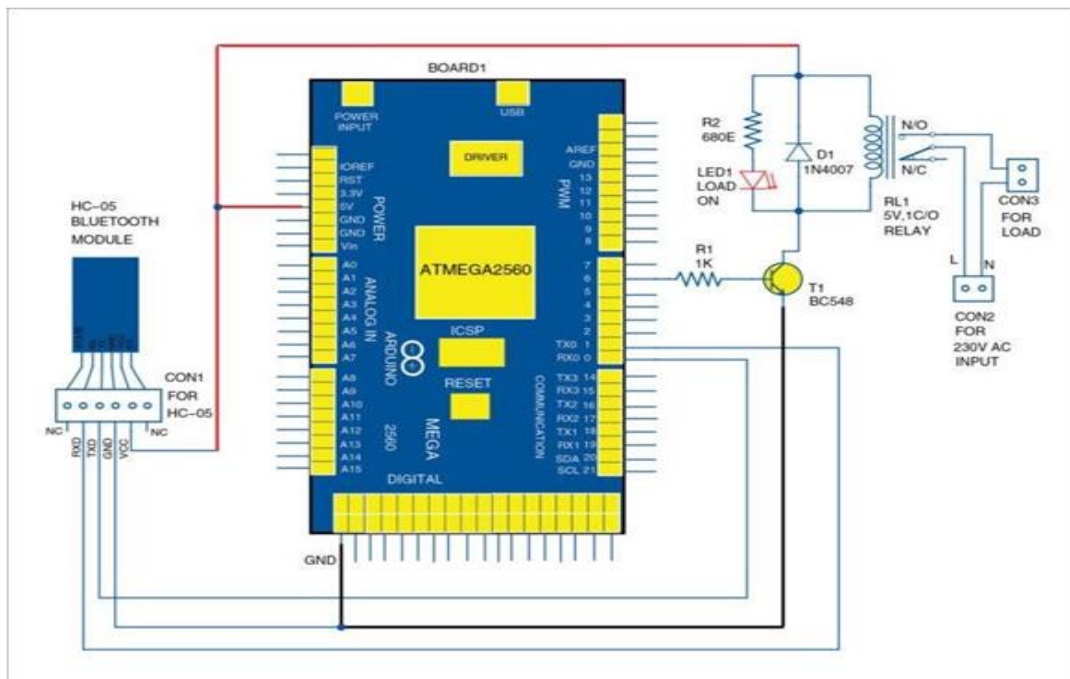The following diagram explains the overall circuit of the project:
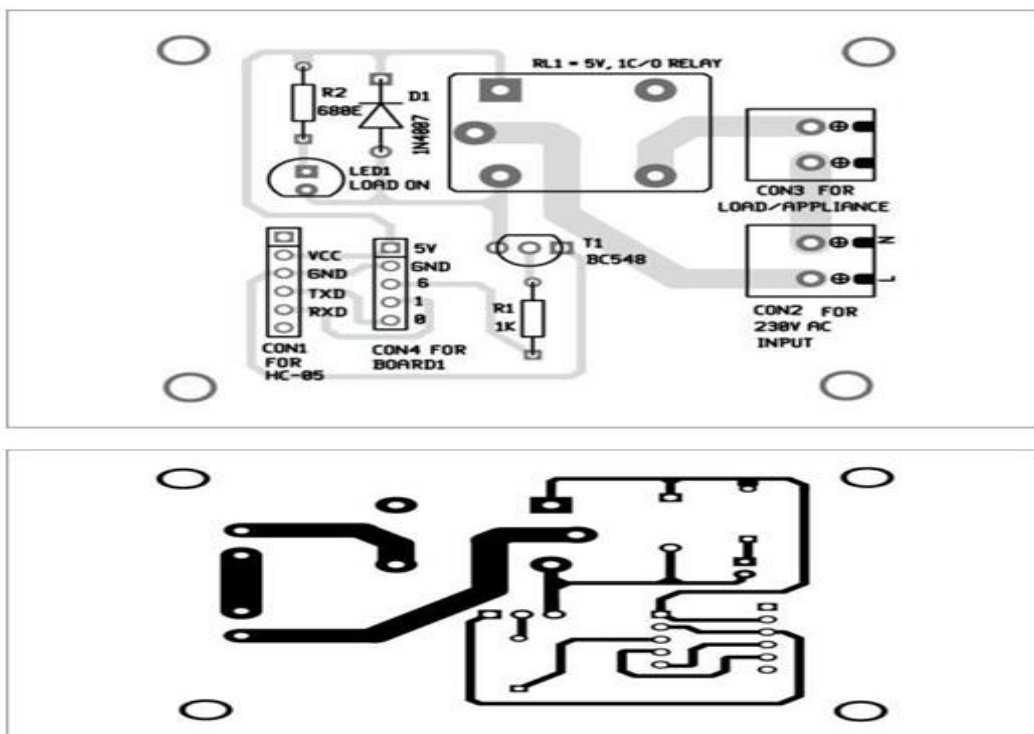

Fig 2:- Circuit Diagram

IV. PCB LAYOUT

Fig 3:- PCB layout

V. FLOW CHART

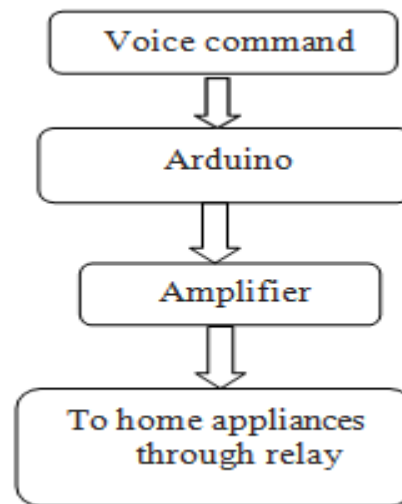The following flow chart explain the process carried,:

Fig 4:- Flow Chart of the Process Carried

A. Bluetooth Module

Bluetooth module is the inter link between android mobile and micro controller. We have used module HC-05, which is cost effective. HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. The HC-05 Bluetooth Module can be used in a Master or Slave configuration, making it a great solution for wireless communication. This serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3 Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH (Adaptive Frequency Hopping Feature).

B. Micro Controller

The command from mobile is given to the micro controller through HC- 05 module. The micro controller used is arduino-uno. Based on the command given and program uploaded in arduino it gives the output, which is the main part of our project. Arduino converts analog to digital signal. Hence the analog input from the android mobile is converted digitally using arduino and given to the amplifier circuit.

C. Amplifier Circuit

We have used BC-547 NPN transistor which acts as amplifier in CE configuration. The digital signal from arduino is given to the base of the transistor through the 1 k ohm resistor, while its emitter is grounded and amplified output is obtained from its collector.

D. Relay Module

We have used 12 volt relay which has 5 terminals the output signal from amplifier is given to one coil supply terminal and the other terminal is given to positive terminal of 12v supply. While the normally open terminal and common terminal is connected 230v ac supply through the load.

VI. PROCESS

We normally control the electric appliances using the switch boards, but in our project we do that in an easy and interactive way. We send our VOICE command using GOOGLE VOICE (eg: LIGHT ON and LIGHT OFF for switching the light on and off respectively) to the ARDUINO UNO. For this communicating purpose, we use BLUETOOTH MODULE as a channeling device. Then the arduino compares the voice command with the pre-installed variable string and activates that particular digital pin accordingly which then passes the electricity to that particular relay circuit and helps to control the electronic device.

VII. RESULT AND DISCUSSION

The following photos verifies our project results.

Fig 5:- Voice command NOT given

Fig 6:- Voice command is given

VIII. CONCLUSION

Here we implement this project in home automation; It can also be used further for industrial purposes. It can also be developed with modern networks like Wi-Fi, IOT etc.. Thus we believe that our project will be very useful to everyone and especially for the disabled persons.

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