

# Human Voice Controlled Home Appliances

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**Abstract:** The key objective of our system design is to provide easy means for normal, handicapped and old age persons to control and operate home appliances. Since home automation is gaining popularity day by day in today's world, we require a system which is affordable and simple to implement. Both these qualities are present in our project which has the capability to replace existing technologies. Practical voice recognition kit is utilized in order to store and recognize the user's voice. Moreover, this project also helps in efficient use of the electricity which is an important constraint in day to day life.

**Keywords:** Atmega16, Voice Recognition, CodeVision AVR, USBasp, AVRdude, HM2007

## I. INTRODUCTION

Today world is a global hub due to advancements in technology. Inventions and evolution in technology has made this possible. Home automation has an important role in people's life when it comes to their standard of living as it provides convenient and hassle free environment.

We require the intelligence of a microcontroller to control the devices and home appliances. There are various existing technologies available for similar purposes but their cost and complexity is major disadvantage.

In this project, we have designed an affordable and simple to use system that takes the input from the voice recognition module and uses the microcontroller's intelligence to operate different devices.

## II. PROPOSED SYSTEM

Here in our project, we have used AVR Microcontroller Atmega16 [1] along with voice recognition module kit HM2007 [2].

The performance of AVR is best when interfaced with voice recognition technology. HM2007 is the cheapest and yet efficient voice recognition technology. Minimum number of components is used for this project.

First the user has to store the commands and then speak again so that the HM2007 can recognize that particular command to operate accordingly.

Fig 1 shows the complete connections for the proposed system. Software used for programming of microcontroller is CodeVisionAVR [3] and interfacing was done using USBasp.

### A. HM2007

It is a practical voice recognition system that is easy to train and implement. It means that the circuit will recognize the words when we train it by giving voice commands.

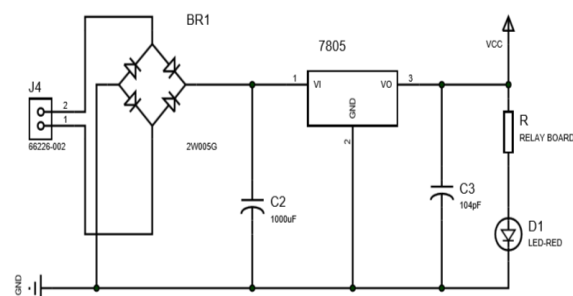
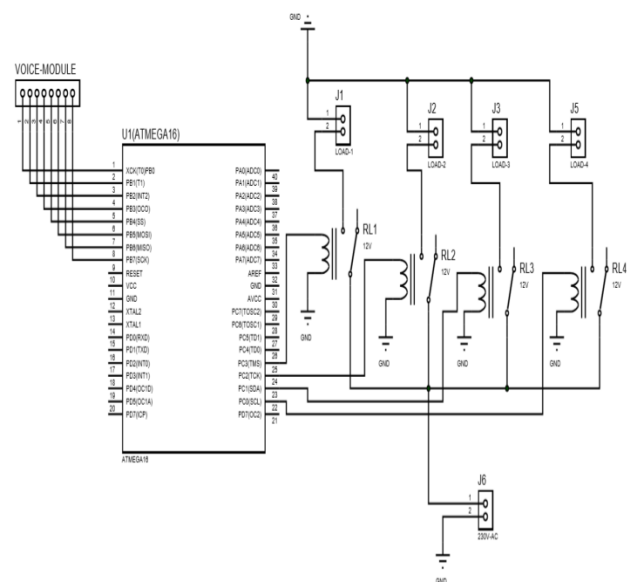


Fig. 1. Circuitry of complete system

### B. Atmega16 Microcontroller

It is a part of Atmel's Mega AVR family. It is an 8-bit microcontroller with high performance and has less power consumption. Atmega16 comprises of enhanced RISC architecture. Maximum frequency on which it can work is 16MHz.

### III. WORKING OF THE SYSTEM

Firstly, 230V AC supply is converted to 5V DC using 12V step down transformer, Round bridge rectifier, smoothing circuit and LM7805 Voltage regulator.

The working principle of speech recognition comprises of the fact that command given by any person generates vibrations or disturbances called as sound pulses.

These analog waveforms are converted to digital form and decoded to appropriate commands including words and sentences.

Initially, train the voice recognition module HM2007 with the suitable commands and say the commands after that. The commands will be stored in binary form and fed to Atmega16 microcontroller through 8 bit data bus using latch IC.

The microcontroller operates according to the program fed into it. Port B is used to take input from voice recognition module and Port C is used to control output devices.

According to the program fed, microcontroller will respond to the instructions and will turn on/off the devices as and when required.

Fig 2 depicts the implementation of the proposed system.

### IV. RESULT

The voice recognition system was first tested in a quiet room with one user. All commands were correctly recognized by the system. Next we tested it with a different user on whom the system was not trained.

About 5% errors occurred here, for example words like “accept” were recognized as “except”. This was because the recognizer heard a different pronunciation.

Although, if the person had spoken the command multiple times the recognizer had sufficient examples to properly determine what pronunciation the person spoke.

Then we tested the project in a noisy room by turning on some music in that room.

When the sound was light there was no problem in correctly recognizing the words but when we increased the volume the recognizer found it difficult to recognize the user’s voice and often took commands from what it heard in the song.

With the knowledge of operation of the system was tested step by step to the transistor output and the load was connected across the collector terminal of the transistor.



Fig. 2. Implementation of proposed system

### V. CONCLUSION

The prototype of system which is used for controlling devices through human voice is proposed and implemented and several changes can be done in this to suite different applications and scenarios.

Following learning’s were provided by this project: Speech recognition module operation, Interfacing Speech recognition module to Microcontroller and Relay working principle.

### ACKNOWLEDGMENT

We would like to extend our sincere gratitude to the Principal **Dr. A. R. Bhalerao**, Head of Department Electronics & Telecommunication, **Prof. R.M. Khaire**, Project guide **Mr. A. Prabhakar**, who gave us their careful and ardent guidance because of which we are able to complete this project.

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