

# DTMF Based Speed Control of DC Motor

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**Abstract:-** DTMF based motor control is a method which uses Dual Tone Multi Frequency(DTMF) technology to control a dc motor by using a mobile phone. A call is made to the mobile phone connected to the dc motor and during the course of the call, whatever key is pressed on the mobile phone is heard at the other end. This tone is perceived by the Arduino and decoded using a DTMF decoder. The Arduino then directs the IC to drive the motor which causes the motor to move. The motor is operated at different speeds.

**Keywords:-** Dual Tone Multi Frequency (DTMF), Integrated Circuits (IC), Arduino.

## I. INTRODUCTION

Motors are one of the most important components of the electrical industry and have their applications in every sphere of the sciences and engineering. The DC motors are used at various places such as industries, households, electric cars and a whole lot of other places. So, their speed and position control is a very important aspect of electrical engineering. A lot of speed drives are present which are used for the control of and high power drives both for AC and DC motors. In this paper our research is mainly focused on the operation of low power motor and low power motor drives however the research can be extended for application to high power motors and high power drives.

Here in our research we use the DTMF technology used by mobile phones to generate frequencies which are then processed by the ARDUINO UNO Microcontroller which is used to power a L293D motor driver circuit. This gives a wireless control of the motor and motor can be made to move forward and reverse with varying speeds and made to stop. When operated with two motors, both the motors can be made to synchronize and function like they do in an actual car. DTMF technology or the Dual tone Multi Frequency signals are a combination of signals generated by dial tone phones which emit a particular frequency on the basis of the sound generated by the phone. The IC MT8870 is used for detecting and catching this signals or frequencies and then these signals are converted into binary form and fed to the Arduino UNO. Using this microprocessor, we can input or feed signals to motor driver circuit which is then ultimately used to drive the motor circuit. Generally, a dial mobile is connected with the DTMF module using an AUX cable and another remote phone from anywhere in the world with an active network signal can be used to call the connected phone. Once the phone is picked up by the connected phone we can operate the DC motor as we wish to operate in the system.

This technology has a lot of future prospects and can be extended to use for various purposes such as robotic cars, surveillance bots, automated bots, maintenance bots, irrigation pumps, defense purposes and a lot of applied sciences and

engineering field. This paper proposes a method to control this motors in a very simple and cost effective way.

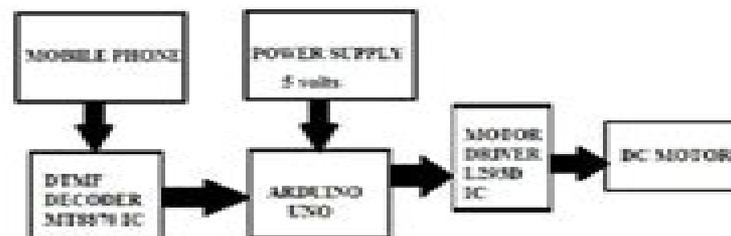


Fig 1:- Block diagram of DTMF based speed control of DC Motor

## II. HARDWARE USED

### A. DTMF (Dual Tone Multi Frequency)

DTMF technology or Dual Tone Multi Frequency Technology is a form of communication through signals which involves recognizing the tones produced on a DTMF keypad. Two frequencies combine to produce a DTMF tone, one is of high frequency tone and the other is of low frequency. A mobile phone consists of numbers (0-9), symbols and letters (A-D). For each letter and number, a specific set of frequency are paired which combine to generate a DTMF tone whenever a key is pressed.



Fig 2:- DTMF Keypad Frequencies

For example, if the "8" key is pressed then generated frequency tone is  $850 + 1336 = 2186$  Hz.

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## **Table of Contents File On Dtmf Based Dc Motor**

1. Understanding the eBook File On Dtmf Based Dc Motor
  - The Rise of Digital Reading File On Dtmf Based Dc Motor
  - Advantages of eBooks Over Traditional Books
2. Identifying File On Dtmf Based Dc Motor
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an File On Dtmf Based Dc Motor
  - User-Friendly Interface
4. Exploring eBook Recommendations from File On Dtmf Based Dc Motor

- Personalized Recommendations
  - File On Dtmf Based Dc Motor User Reviews and Ratings
  - File On Dtmf Based Dc Motor and Bestseller Lists
5. Accessing File On Dtmf Based Dc Motor Free and Paid eBooks
    - File On Dtmf Based Dc Motor Public Domain eBooks
    - File On Dtmf Based Dc Motor eBook Subscription Services
    - File On Dtmf Based Dc Motor Budget-Friendly Options
  6. Navigating File On Dtmf Based Dc Motor eBook Formats
    - ePub, PDF, MOBI, and More
    - File On Dtmf Based Dc Motor Compatibility with Devices
    - File On Dtmf Based Dc Motor Enhanced eBook Features
  7. Enhancing Your Reading Experience
    - Adjustable Fonts and Text Sizes of File On Dtmf Based Dc Motor
    - Highlighting and Note-Taking File On Dtmf Based Dc Motor
    - Interactive Elements File On Dtmf Based Dc Motor
  8. Staying Engaged with File On Dtmf Based Dc Motor
    - Joining Online Reading Communities
    - Participating in Virtual Book Clubs
    - Following Authors and Publishers File On Dtmf Based Dc Motor
  9. Balancing eBooks and Physical Books File On Dtmf Based Dc Motor
    - Benefits of a Digital Library
    - Creating a Diverse Reading Collection File On Dtmf Based Dc Motor
  10. Overcoming Reading Challenges
    - Dealing with Digital Eye Strain
    - Minimizing Distractions
    - Managing Screen Time
  11. Cultivating a Reading Routine File On Dtmf Based Dc Motor
    - Setting Reading Goals File On Dtmf Based Dc Motor
    - Carving Out Dedicated Reading Time
  12. Sourcing Reliable Information of File On Dtmf Based Dc Motor

- 
- Fact-Checking eBook Content of File On Dtmf Based Dc Motor
  - Distinguishing Credible Sources
13. Promoting Lifelong Learning
- Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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