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IOT MINI PROJECT REPORT

On

DUAL TONE MULTI FREQUENCY CONTROLLED BOT

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CERTIFICATE

Certified that the IOT Mini Project Work entitled **"DUAL TONE MULTI FREQUENCY CONTROLLED BOT"** carried by **Mr. PRANEETH (4DM20IS034), Mr. PRANEETH JAIN (4DM20IS035), Mr. S HARSHAVARDHAN (4DM20IS039), Mr. THOUFEEQ M I (4DM20IS054)** bonafide students of **Yenepoya Institute of Technology** in partial fulfillment for the award of **Bachelor of Engineering in Information Science & Engineering** of the **Visveswaraya Technological University, Belagavi** during the year2023-2024.It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in all report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

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ABSTRACT

In this project, a new technology is implemented by using the robot vehicle. This robot vehicle is operated using (DTMF) Dual Tone Multi Frequency. DTMF technology can be useful in day to day life. This technology is unique to the present generation. This technology is based on the concept of Digital Signal Processing. Earlier Radio Frequency (RF) circuit is used for wireless controlling but it has the big disadvantage that is range due to which it limit the control and has adverse effect on the performance of the vehicle. Whereas the DTMF converts this disadvantages of RF circuit into advantages. It provide increase range of working and also provide better result. In case of motion and controlling the movement of robot. This system is controlled / operated using phone in microcontroller. This wireless communication is the remote handling operation of robot using DTMF which provides movement instructions to the bot.

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CHAPTER 1

INTRODUCTION

This project enlighten the very new innovative concept for the today's world. It will help the modern technology to developed new concept and innovation. This system is inspiring to the modern carless driver. This system uses the dual tone multi frequency in it.

The DTMF is the install in a robot car. This robot car is controlled, monitor and operated by a mobile. The mobile will provide the movement command to the robot which will be accessible using DTMF. The robot is controlled with a mobile phone that make a call to the mobile phone attach to the robot. While the call is on, if any button is pressed this button press at sensor act as a command. This command is sends at the other end of the call this is called as dual tone multi-frequency. Earlier wireless controlled robot where using RF circuit in it. This RF circuit has many disadvantages but one of the biggest advantages was limited working range, limited frequency range and limited control. This has adverse effect on the performance of the robotic vehicle. Use of mobile phone in the system is the biggest powerful to balance the system and overcome the drawback.

It also provides the advantages such as robust control working range as large as the coverage range of the service provider. the Atmega328 microcontroller is used in the system. This microcontroller is used to process the command / receive tones with the help of DTMF decoder. Than the microcontroller transmit the signal / command to the motor driver IC to operate the motor and our robot so as to start the movement.

CHAPTER 2

FUNCTIONAL PARTITIONING

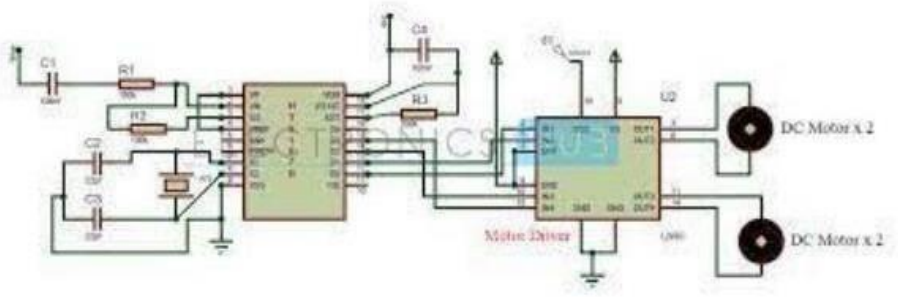
2.1 METHODOLOGY

The methodology for constructing a dual tone multi frequency controlled bot follows a systematic progression to ensure a successful and functional end result. The process begins with the assembly of a robust chassis using materials like foamboard, providing a stable foundation for the vehicle. Motors and wheels are securely attached, emphasizing stability and durability.

This project consist of following blocks AVR Microcontroller Atmega328, DTMF Decoder IC, Motor Driver circuit, power supply, DC motors and mobile phones.

The Arduino is used to command the system. In this system the Arduino consist of Atmega328 IC in which we can implement a program and give the commands to the other devices. The mobile phones is used as a DTMF generator and receiver respectively. Then the DTMF decoder is used to decode the received signal and convert it into binary form and gives to the Atmega328 that means microcontroller. When the key is pressed on mobile keypad then the DC motors start rotating.

Fig 2.1.1 Circuit diagram



2.2 WORKING

The DTMF robotic car consist of two mobile phones each one as both ends. Each mobile phones are used to trigger the commands to the robotic car. The phone 1 act as transmitter. It gives the command to the robotic car to the phone 2 which act as a receiver. The phone 2 receives the command and processes the command accordingly. In order to operate the robot, one need to make a call to the mobile phone attached to the robot from the phone 1 placed at the transmitter end. The mobile phone act as DTMF generator with tone depending on the key pressed. The phone sends the DTMF tones at the input signal on pressing the numeric button available at the display or keypad of mobile phone. The mobile phone attached to the robot is kept in auto answer mode. This mode is answerable automatically to specific contact feed in it. So when the transmitter, mobile phone 1 makes a call, the mobile phone 2, receiver, receive it automatically. The numeric button available at the mobile phone are used to perform action as listed in commands in the AVR controller or program feed to the IC. The generated DTMF tone are then received by cell phone in the robot, the received tone is processed by the microcontroller with the help of DTMF decoder. DTMF decoder decodes the received tone and gives binary equivalent of it to the microcontroller. The Atmega328 is program accordingly to execute the appropriate command. The output of the Atmega328 is given to the motor driver IC. This motor driver is connected to DC motors. This motor driver is capable of handling two motors correspondingly. The movement of two DC motors is control by this motor driver. When a key is pressed on the transmitter mobile phone, phone 1 then it received at the mobile phone 2. The DTMF decoder is connected to the phone 2 so it will received the signals and convert it into binary form and gives to the AVR microcontroller. In AVR micro controller the Atmega328 IC is used with the help of the programming the command will be gives to the motor driver. Then the motor driver gives the command to DC motors to rotate the motors and move the vehicle or car. So with the help of motor driver and DC motor car will move in directions so the motor driver is act as control the movement of the car.

CHAPTER 3
COMPONENT REQUIRED

3.1 COMPONENT USED

The following components are the devices used to build the circuit

- DTMF DECODER
- MOTOR DRIVER CIRCUIT
- POWER SUPPLY
- DC MOTORS

DTMF DECODER:

The DTMF Decoder is used to decode the received signal from the mobile phones and convert it into binary form and gives to the respective AVR microcontroller. It is 4bit binary TTL 5volt output. Is has a LCD which indicates the output of the DTMF Decoder. It required 5volt DC power supply to work properly. It is also used for various applications like remote monitoring, Caller ID,Auto Dialer, Remote Control.

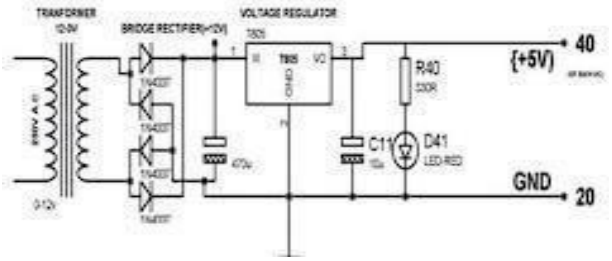


Fig 3.1.1 DTMF DECODE

MOTOR DRIVER CIRCUIT:

The motor driver circuit is integrated circuit which will be used to control the robots. motor drivers to give high power to the motor by using a small voltage signal from a microcontroller or a control system.

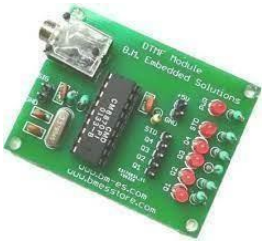


Fig 3.1.2 MOTOR DRIVER CIRCUIT

POWER SUPPLY:

Power supply is a circuit it converts unregulated DC into constant DC with the help of rectifier. It converts AC supply into DC. Its function is to supply a stable voltage to a circuit or device that must be operated within certain power supply limits. The output from the regulated power supply maybe alternating or unidirectional, but is nearly always DC.

DC MOTORS:

The 6volt 50 rpm generated DC motor is usedin this system. The motors are significant on rpm of it like 50rpm, 75rpm, 150rpm, 250rpm.In this system we used 50 rpm motor which is connected to the motor driver. The motor driver gives the command to the motors to rotatewith the help of AVR controller. The motors is used to movement of the robot or vehicle

Fig 3.1.4 DC Motors

CHAPTER

CONCLUSION

At the end we conclude that it can overcome the limitations and problems. It provides the advantages of robust control, working By developing this robotic vehicle,in previous system the RF communication would be used but it is short range communication so to overcome this short range problem we make system which is consist of DTMF technology. So the short range problem will be overcome because the DTMF is used for long distance communication. So with the help of this technology we controlled our car from anywhere and anytime. In this project with the use of mobile phone range as large as thecoverage area of the service provider, no interference with other controllers and up to 12 controls although the appearance and capabilities of robots vary vastly, all robots share the features of a mechanical, movable structure under some form of control. So it is useful for themany systems like military, law enforcement, search and rescue operations etc.