DTMF CONTROLLED ROBOTIC CAR

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Abstract - *In this paper, 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 sing DTMF.*

Key Words: DTMF, AVR Microcontroller Atmega328P, Mobile phones, Motor Driver, DC Motor

I.   INTRODUCTION

This paper 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.

II.   LITRATURE SURVEY

[1]The authors Awab Faikh, Jovita Serao presented a paper titled"Cell phone operated robotic car". In this paper the authors used IC89C51, DTMF, radio control, remote control vehicle and design the new method of construction of cell phone controlled robotic car. The RF circuit are used for limited distance so to overcome this problem authors uses the DTMF which will used for long distance. The main aim of this project is to control a robotic car using DTMF frequency.

[2]In the year April 2014 the author amey kelkar presented a paper "Implementation of unmanned vehicle using GSM network with Arduino" In this paper author used robot, GSM, Arduino, DTMF decoder. In this paper they represented a vehicle development which is controlled by GSM and an Arduino is used for design of the vehicle. This system used DTMF frequency and it can be controlled over very long distance. The C & C++ language is used as programing language in this system.

III.   BLOCK DIAGRAM

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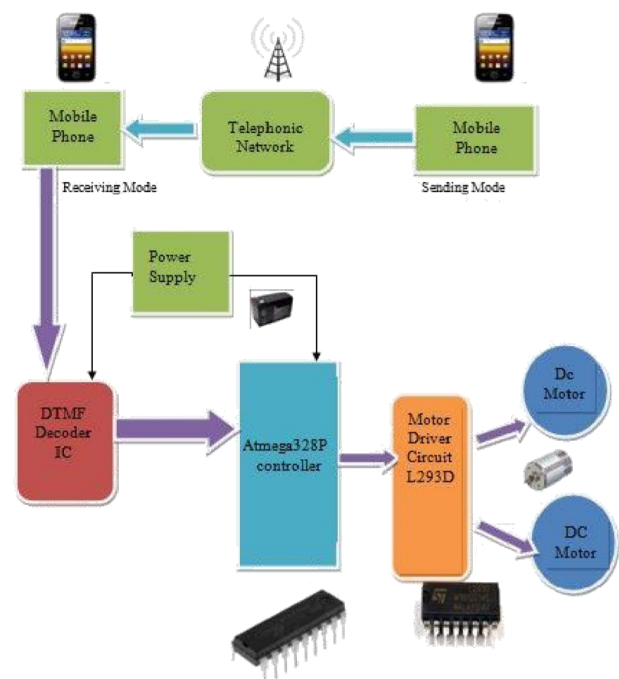

Fig. 1: BLOCK DIAGRAM OF DTMF CONTROLLED ROBOTIC CAR

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.

IV.   FUNCTIONS OF COMPONENTS

[1]ARDUINO: It is an open source computer hardware & software & software company project & user community that designs & manufactures single-board microcontrollers & microcontroller kit. Hardware means arduino circuit & software means where we can type our program or command the arduino. So basically it has two sides like programing to control the project & hardware means arduino device.

Fig. 2: ARDUINO UNO

It is tool for control the project or give the instruction to the circuit or project. Arduino UNO is very easy to use & it is cost efficient & easily available in the market. The simple c programing language is used & very easy to implement the program like just connect the arduino to computer using connector cable & implement the program.

[2]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.

Fig. 3: DTMF DECODER

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.

[3]MOTOR DRIVER CIRCUIT: The motor driver circuit is integrated circuit which will be used to control the robots.
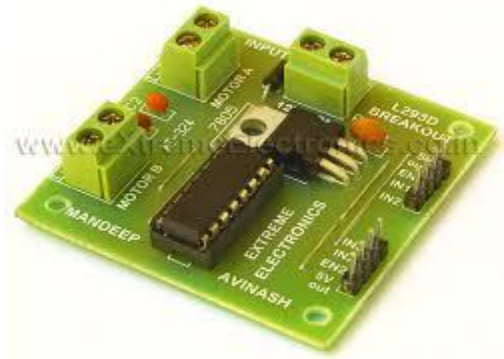

Fig. 4: MOTOR DRIVER CIRCUIT

The motor driver circuit is connected to the AVR microcontroller with the help of controller it will gives the command or control the robot. The L293D is commonly used motor driver IC which is used to control the 2 DC motors simultaneously.

[4]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.
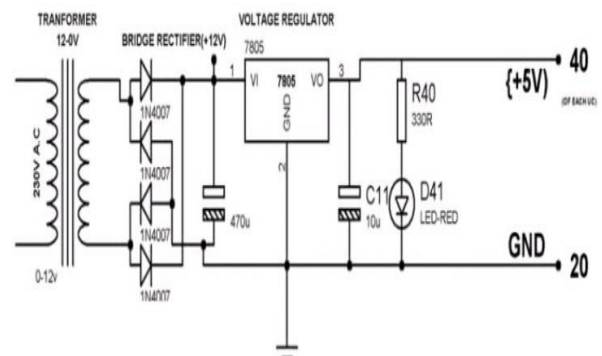

Fig.5: POWER SUPPLY

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.

[5]DC MOTORS: The 6volt 50 rpm generated DC motor is used in 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.

Fig. 6: DC MOTOR

The motor driver gives the command to the motors to rotate with the help of AVR controller. The motors is used to movement of the robot or vehicle.

V. 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 microcontroller 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.

VI. APPLICATIONS

A Robotic Vehicle can be used in numerous applications like

[1]It will be used in Military and Law Enforcement.

[2]It will used in Search and Rescue Operations and Scientific Applications.

[3]It is Wireless so will be useful in wireless control systems.

[4]It will be helpful for Surveillance System.

[5]It is used in Vehicle Navigation with use of 3G technology.

VII. 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 the coverage 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 the many systems like military, law enforcement, search and rescue operations etc.

VIII. REFERENCES

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