VM RF Robot

(HEAVY LIFTING ROBOT)

RIJWAN ALI, SACHIN KUSHWAHA, SHABEENA BANO, ANJALI BAJPAI,

SHWETA SHARMA

UG Student Department of ECE

Rameshwaram Institute of Technology & Management

*Abstract:*The VM robot made by me is a radio frequency based robot which communicates on a frequency of 432 MHz. Its range is 100 meter, it can transmit and receive data by communicating up to 100 meters. This robot can decode and execute 2000 worlds in a second. This robot is for moving heavy loads from one place to another. We can also use it in entertainment. It can easily carry 15 kg weight from one place to another. It has two sections, one transmitter section and the other receiver section. The transmitter section transmits single and at the same time the receiver installed in our robot decodes and executes it and works according to the received command. By increasing the height of its antenna, we can increase its range, we can control it from far away.

- **Introduction**

The chassis of the VM robot is carefully designed as it moves the load from one place to another. 4 gear motor is used in this robot which is 60 rpm speed of this robot is very slow but this robot has a lot of power. This robot is based on a complete program, four plastic wheels have been used, which is very strong, a lithium ion battery has been installed inside the robot, so that the robot can get power, and its charging system can also be arranged. There is a better feature in this that if we are using the robot and put it on charging, then it will not charge. When we turn off this robot only then its charging starts. This robot is useful for carrying loads as well as for entertainment. It can rotate 360-degree easily in one place. Its size is not very big, it is very small but it is very powerful and efficient.

PROJECR PLANNING

Ply has been used to make the chassis of this robot. Cut the ply recording the robot, and mount the motors, circuit on it as shown in the image.
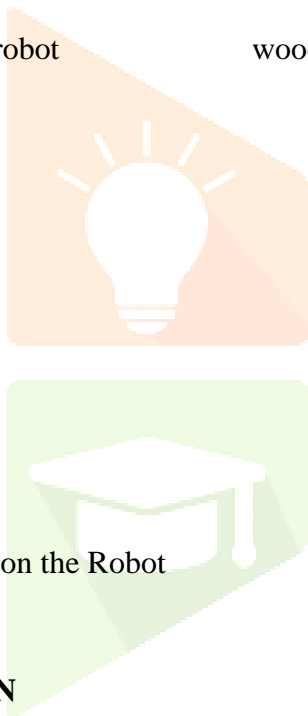
Components needed for the robot

Wood sheet for the body of the robot

wood Sheet Cutting and Printing Process

Installing the Motor and battery on the Robot

Top view of robot

TRANSMITTER SECTION

In transmitter section I have used Arduino Uno and used single axis justice and I have used a VM transmitter in it which generates frequency of 432 MHz and transmits the signal. I have soldered all the components according to the circuit diagram. And after that I have put an antenna in it whose height we can reduce so that we can control the robot till long-range.
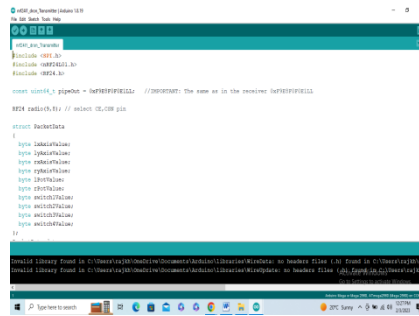

Push switch for power supply on off

I have used the push switch to turn off the power supply, it is attached to both the transmitter and the receiver, so that we can access their sections.
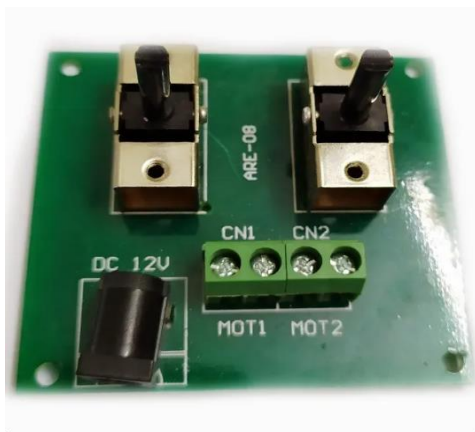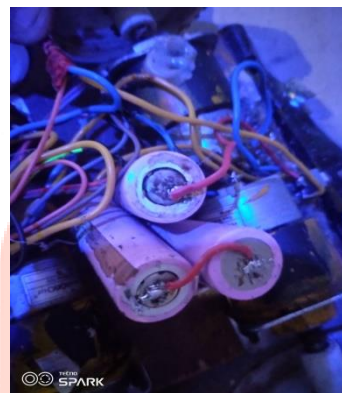
Arduino uno

Arduino software

We can program Arduino Uno with the help of Arduino software and this program will be for transmitter. It only supports c programming.


Lithium ion battery

DPDT joystick

In transmitter and receiver section, I have used 12 volt lithium ion chargeable battery, which can be recharged after power down, and this will allow our robot to continue working and transmitter and receiver section will always be on.

- **TRANSMITTER CIRCUIT**

I arranged all the components according to the circuit diagram on the zero PCB and soldered them. After the circuit is complete, I programmed the arduino and observed its frequency response on the CRO.
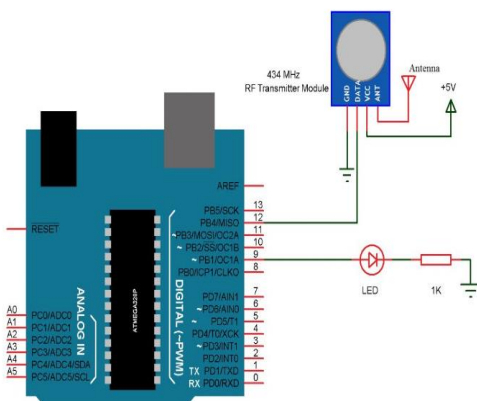

Transmitter cirtcuit diagram

Transmitter Circuit

- **RECEIVER SECTION**

The receiver section decodes and executes by receiving the frequency of 432MHz. The receiver inputs the received command to the Arduino. Arduino reads and writes that command. The arduino gives the output accordion of this. According to the circuit diagram, I assembled all the components and arranged them on the zero PCB, and did the soldering.
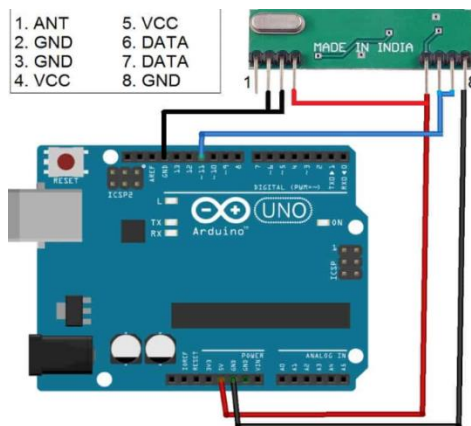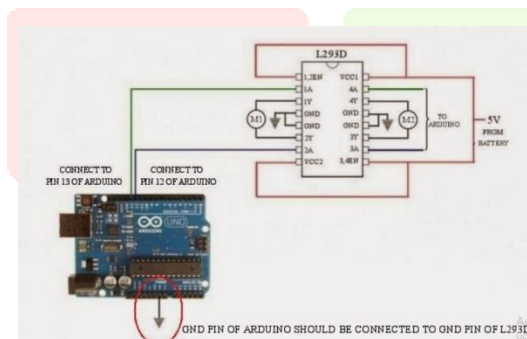

Receiver circuit diagram   **Receiver circuit**

The l293d ic module is a motor driver module, Which makes the motor move in forward reverse direction according to the command received from Arduino. It is a 16 pin IC, which operates on a single supply of 5 V and 12 V to drive the motor.

Connection of arduino and l293d with motor   Gear motor 60rpm

Fixed all the motors according to the circuit diagram, after fixing, connected the arduino and l293d IC, thus the circuit is complete.

- **Conclusion-** This robot is perfect for carrying heavy loads from one place to another. It communicates by operating on a frequency of 432MHz, its connectivity is very good within 100 meter range. This robot uses high power gear motor and 12 volt lithium ion battery has been used inside it. Whose ampere is 3. It can easily carry 15 kg weight from one place to another, in future more load carrying robots can be designed. And the system of self auto guidance can also be installed inside them, so that they can be useful in different areas. I learned from this project that how we can carry heavy loads from one place to another, and how we can control it by sitting at one place.

- **Reference-**

1. VM Robot is a command based robot, which uses the frequency of 432MHz, on this frequency it can transmit and receive commands. We can use this robot in other places also like auto guiding, self parking etc.

2. VM robot made by me is a heavy lifting robot it is for entertainment and carry out the lift. Its height from the ground is 2 cm and its total height is 7 cm, its length is 20 Cm and width is 15 Cm.

- **Result-**

It has taken me 1 months to make this robot and its result is better than my expectation, it can work continuously for 1.5 hour without any interruption. This robot is made only for lift , from this we can take entertainment work. So it has to be operated with not great security. And the functioning of all its parts is very good and it has given very good results like fast commanding, fast response, no break connection, continuous connection speed, better communication etc.