

ROBOVR

SRB RELAY RACING

About the game:

For Relay Race at RoboVR, participants have to build 3 robots per team. The robot developed should have a passing baton mechanism to pass the baton from one robot to another.

Components and its Specifications:

Sr. No.	Components	Specifications
1.	Chassis	Aluminum Sheet (5mm thick)
2.	DC Motor(x2)	20 rpm
3.	Johnson Motors (x4)	300 rpm
4.	Wheels(x4)	Off-road type
5.	Battery	5A, 12V
6.	Remote	With 4 DPDT switches
7.	Wires	8m-10m
8.	Gears	Mechanism of holding Baton

Robot Details:

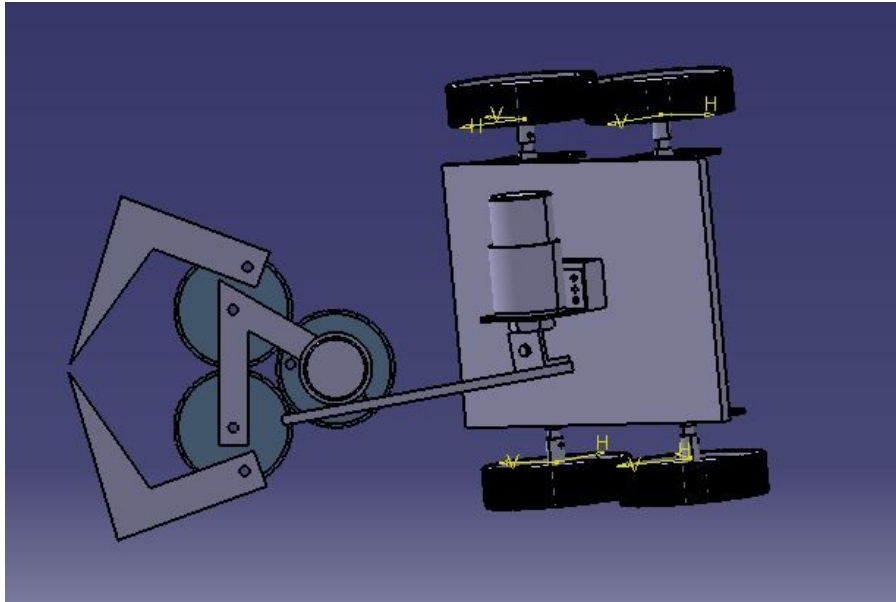
Robot Dimensions: 13" x 9" x 12"

Robot Control: Wired

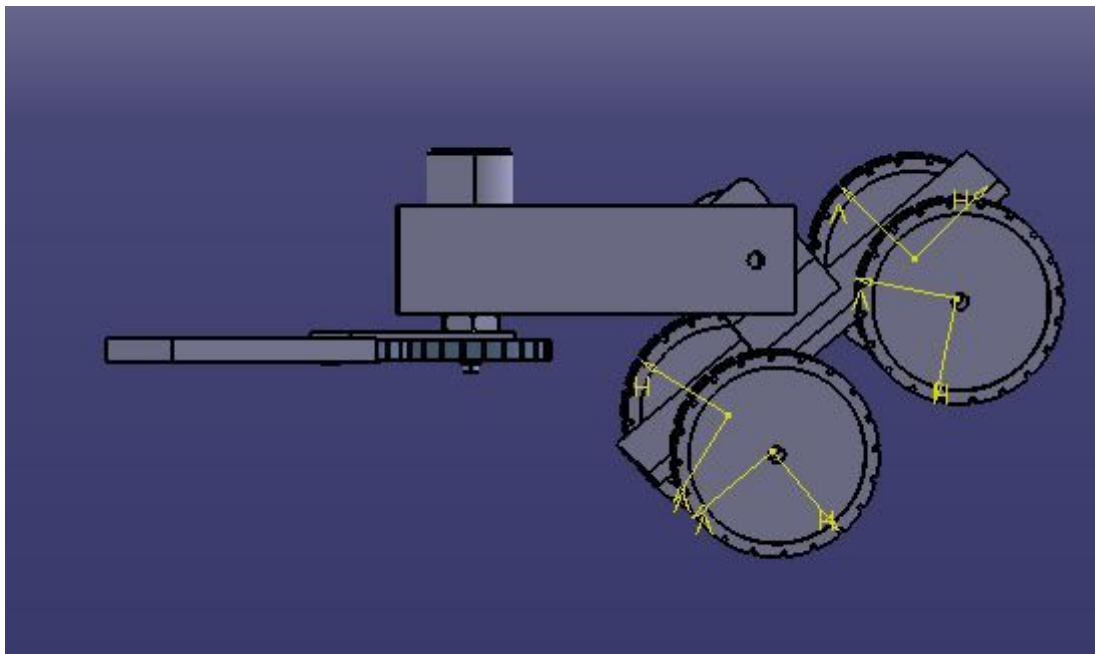
Robot Drive: 4 Wheel Drive

Mechanical Design:

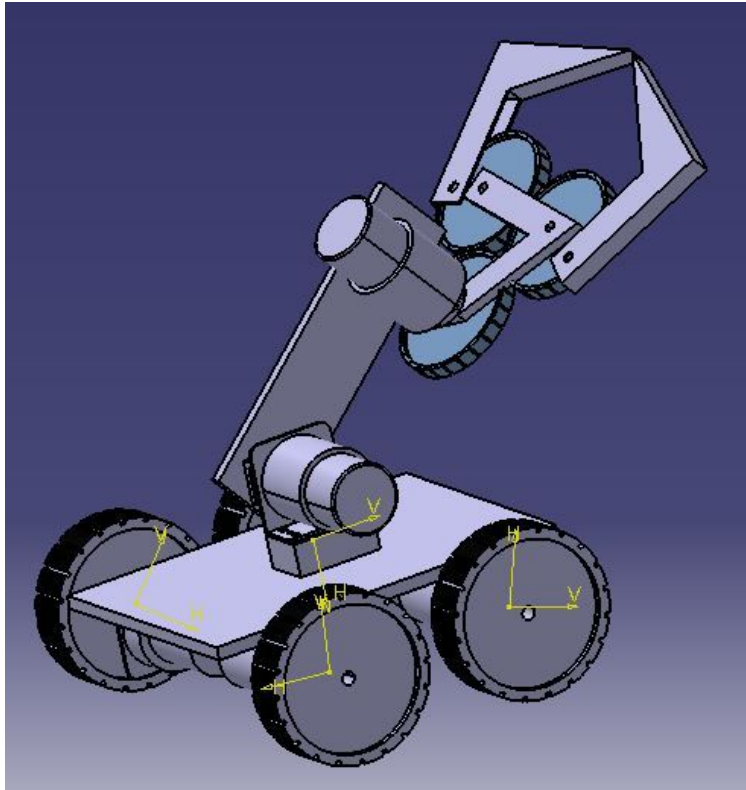
Top View



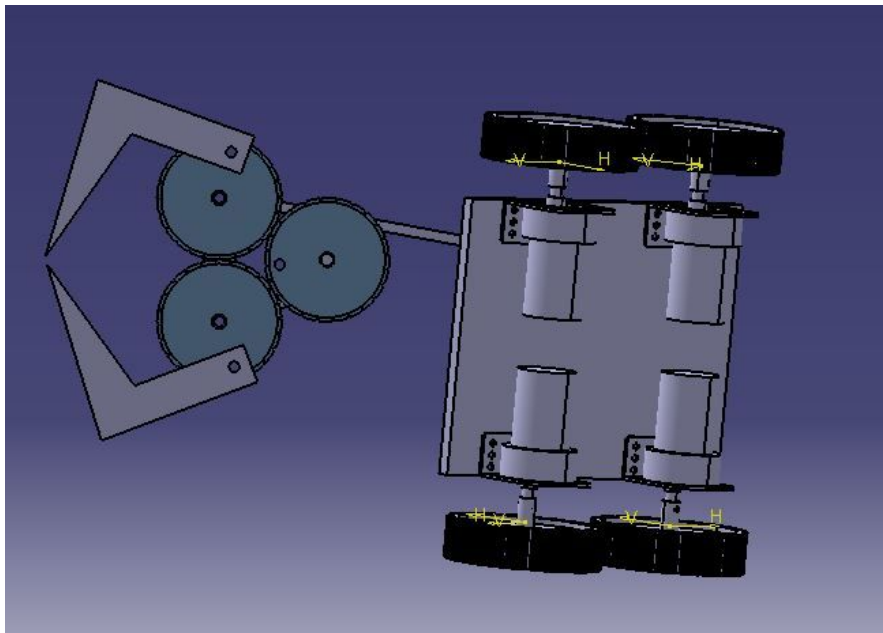
Side View



Isometric View



Bottom View



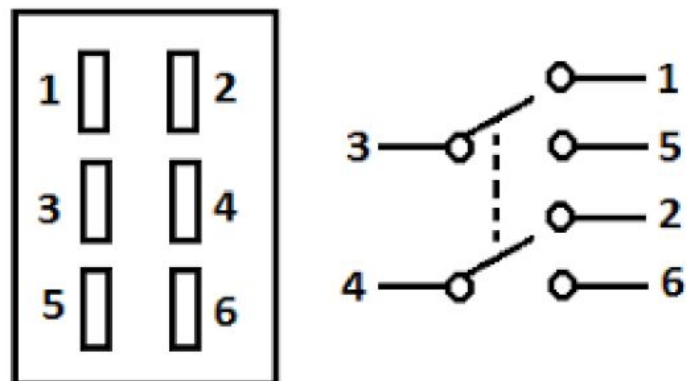
Remote Details:



A similar remote is needed to be built for this robot in which 3 DPDT switches are to be attached instead of 2 as shown in the above figure.

A Double Pole Double Throw (DPDT) switch is an electromechanical switch that has 2 inputs and 4 outputs and each input has 2 corresponding outputs that it can connect to.

Given below is the diagram of a DPDT switch.



Working:

The model developed is a working model. The chassis is made up of acrylic sheet in order to make the bot lightweight for the relay race. Johnson motors used are of 300 rpm to achieve high speed and good accuracy. Two motors of 20 rpm are used for arm and gripper. The holding and passing baton mechanism are made up of gears. The robot is controlled with wired remote having 4 DPDT switches (2 DPDT for movement of the bot and 2 DPDT for arm and gripper).

The movement of the robot with respect to the switch operation are given below in the table.

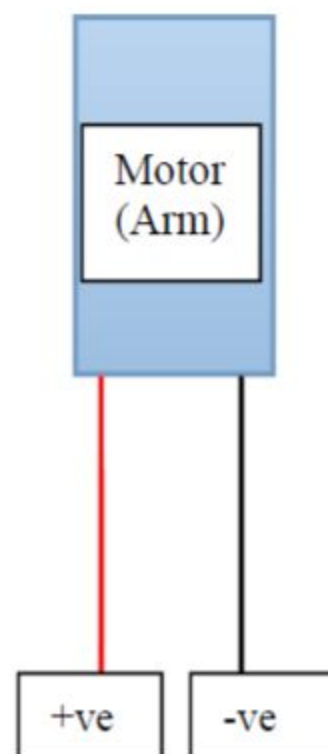
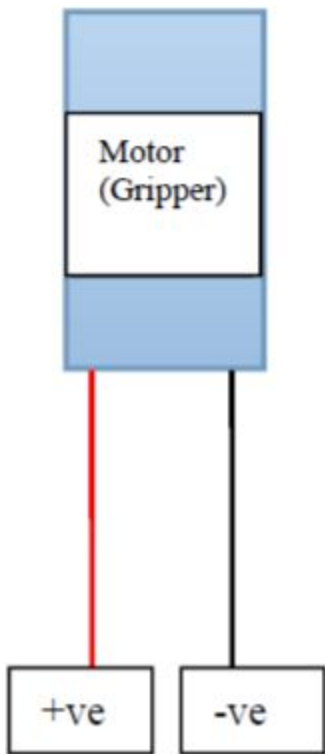
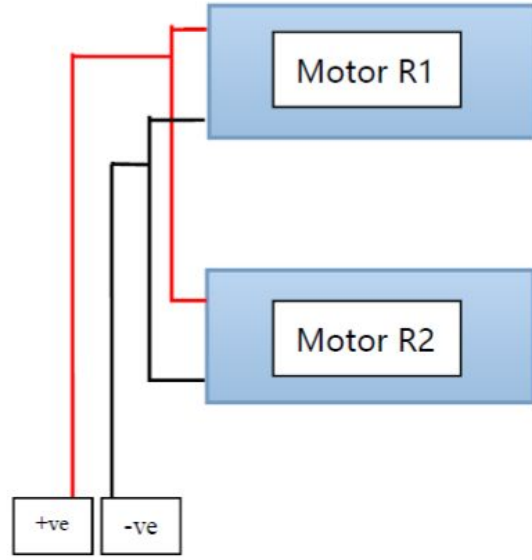
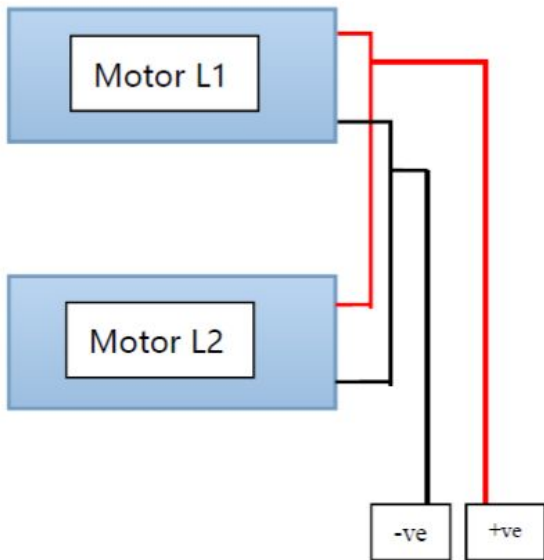
Movement of the Bot :

Motion	Switch B1	Switch B2
Forward	Forward	Forward
Backward	Backward	Backward
Left	n/c	Backward
Right	Backward	n/c
360° Right	Forward	Backward
360° Left	Backward	Forward

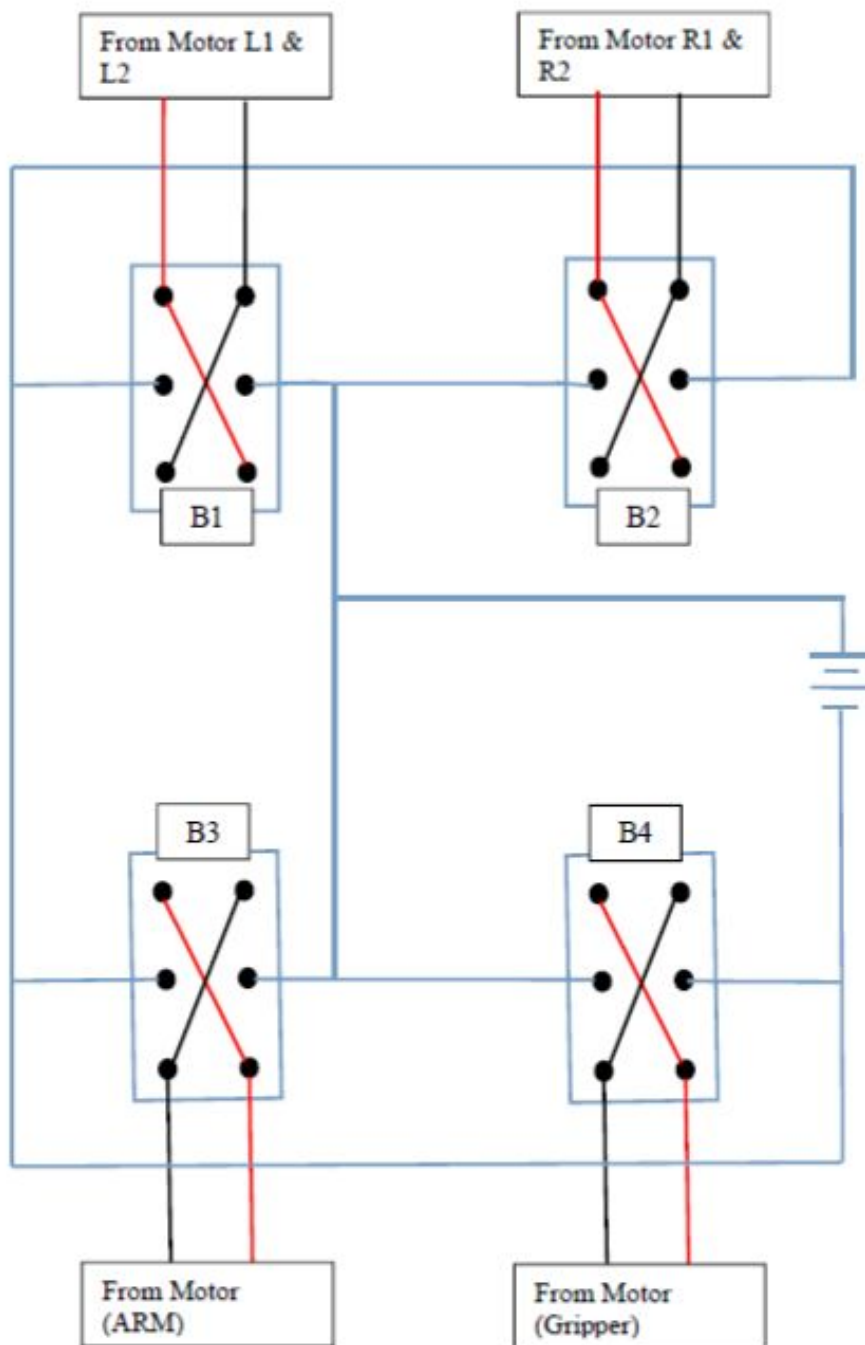
Movement of Arm	Switch B3
Up	Forward
Down	Backward

Movement of Gripper	Switch B4
Open	Forward
Close	Backward

Connections:



Remote Control:



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