



Resistor Motor Driver



by simplecircuits

In this Instructable you will be making a spinning carousel that can be connected to USB drive.

This device was made by Dr Mark Glickman in 2017 and sold a few months later. You can see it working on a video.

Warning: You have to be very careful when connecting this device to USB drive. Poor wiring can damage this port.

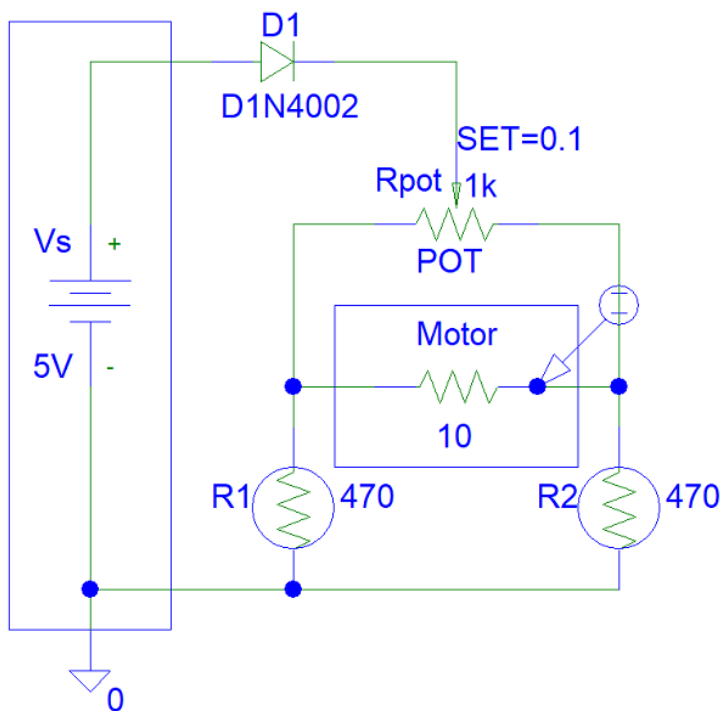
You can check out a similar Instructable made by DIY Circuits:

[rel="nofollow">https://www.instructables.com/id/Resistor-Motor-Dr...](https://www.instructables.com/id/Resistor-Motor-Dr...)

Supplies:

Low current DC motor, wood or cardboard for the sculpture, sticky tape, wheel, high power 470-ohm resistors - 2, 1 kohm high power potentiometer, general-purpose diode, battery or power supply, scissors, wires.

optional: Box cardboard/plastic, battery harness, solder, soldering iron, wire stripper, electric drill, hand drill.

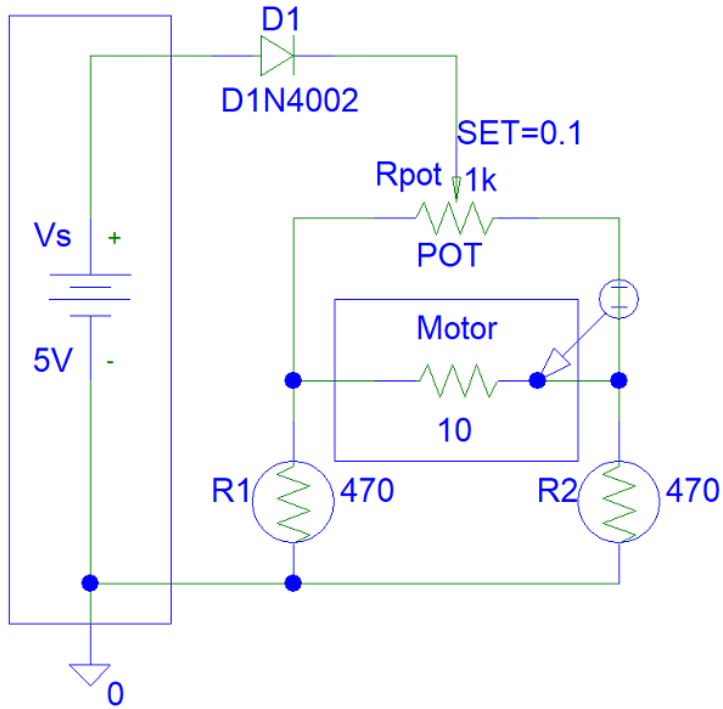


<https://www.youtube.com/watch?v=zP5IkRXY0nM>

Step 1: Draw the Circuit

The D1 diode is used to protect the power source from discharging motor currents. At times the motor does not start spinning. The potentiometer controls the direction and speed of the motor.

In real life, the motor can be modeled as a coil rather than a resistor. However, all coils have a small resistance in practice.



Step 2: Simulations

Simulations show a small current because the potentiometer setting is not zero.

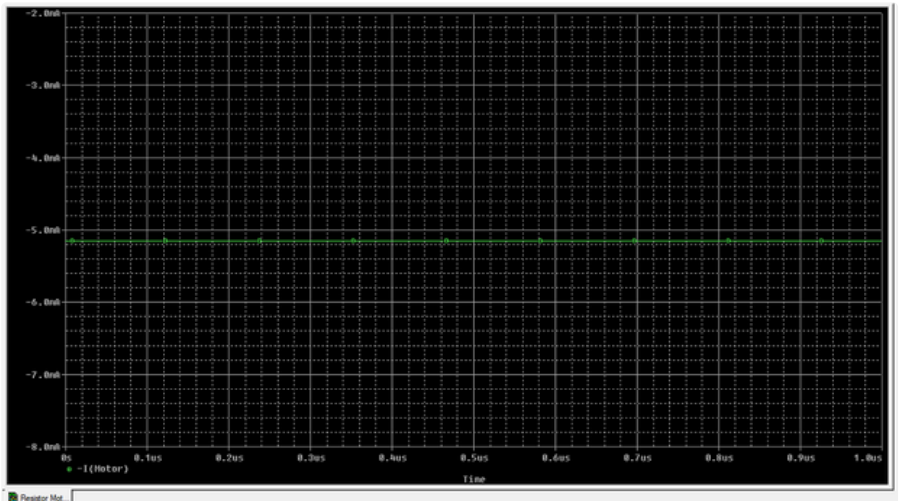
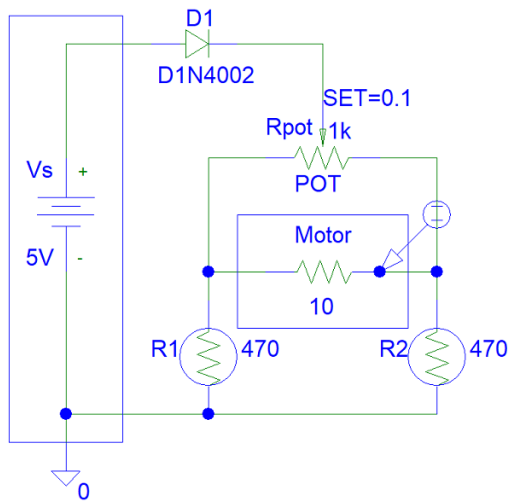
10 ohms + 470 ohm is about 500 ohms.

At full setting, the R_{pot} resistance does not really affect the current across the motor ($1\text{ kohm} \gg 10\text{ ohms}$).

The current across the motor is:

$$(V_s - V_d) / (R_{motor} + R1) = (5\text{ V} - 0.7\text{ V}) / 500\text{ ohms} = 4.3 / 500\text{ ohms} = 4.3\text{ mA} * 2 = 8.6\text{ mA}.$$

This is why you need a low current motor.



Step 3: Make the Device

You are now done.

<https://www.youtube.com/watch?v=zP5lkRXY0nM>