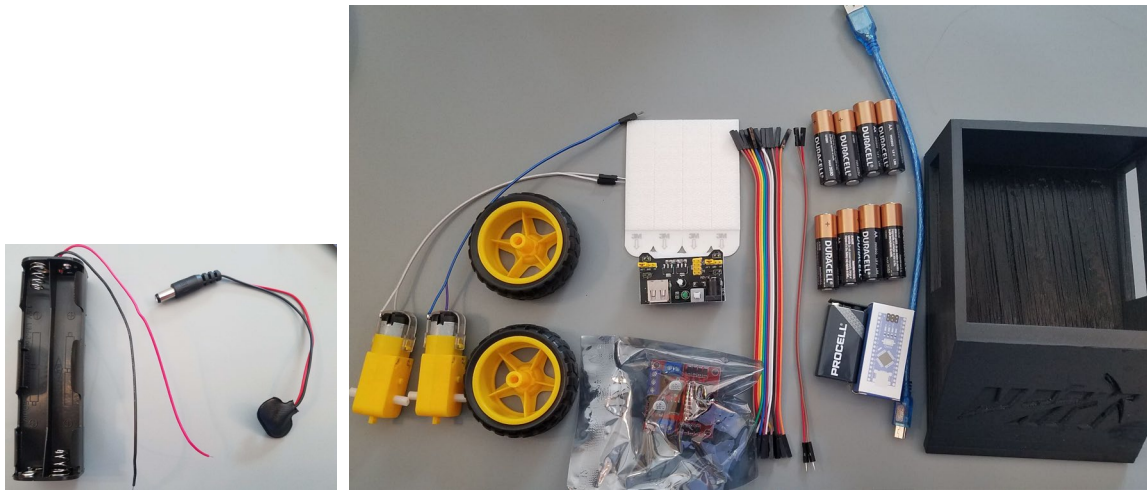


Robot Combat Assembly Instructions

Parts List and Images



Each Bag needs

- 1 Box with a Controller/receiver pair (leave in box) (Not pictured)
- 8 AA batteries
- 1 AA battery power bank
- 1 9V battery (leave the cap on)
- 1 9V battery cable
- 2 motors with lead wires
- 1 Motor Driver
- 13 wires with 2 female ends
- 2 wires with 1 female / 1 male end
- 1 breadboard power supply (leave attached to the foam the board come apart.)
- 4 individual 3M Velcro strips
- 1 Bot frame (includes front blade, box, and lexan cover) (Lexan cover not pictured)
- 1 Arduino Nano

Tool Not Included Small Philips screw driver

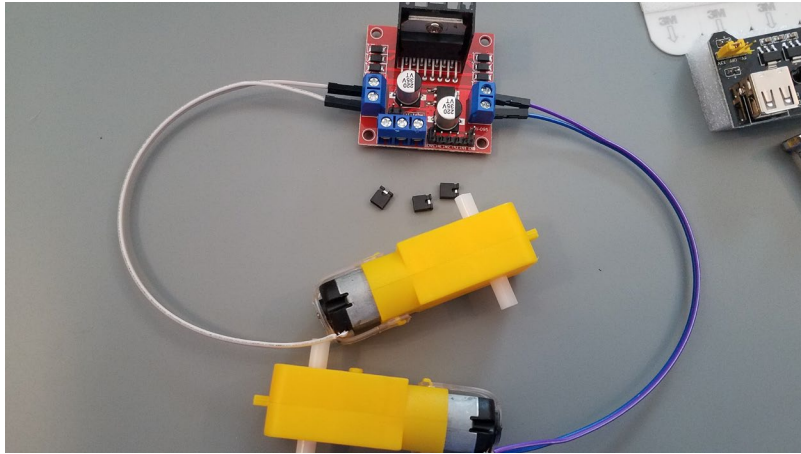
Needle nose pliers to pull jumpers are helpful but not required it can be done with finger nails

1) Electronics wiring

a) Connect Motors

- i) Loosen all 7 of the screw on the motor driver
- ii) Pull all 3 of the jumpers on the motor driver (these allow the motors to be controlled independently)
- iii) Insert the motor wires into the terminals on the left and right of the motor driver board. Then tighten the 4 associated screws. (If you turn the board over these 4 terminals are labeled out 1, 2, 3, and 4. Out 1 and 2 go to one motor and 3 and 4 go to the other.) Since the wires from the motor are unlabeled there is a chance we have them switched and need

to swap wires 1 and 2 or 3 and 4. We will check this once the bot is fully assembled and if one wheel is going in reverse we can fix that by swapping the wires.



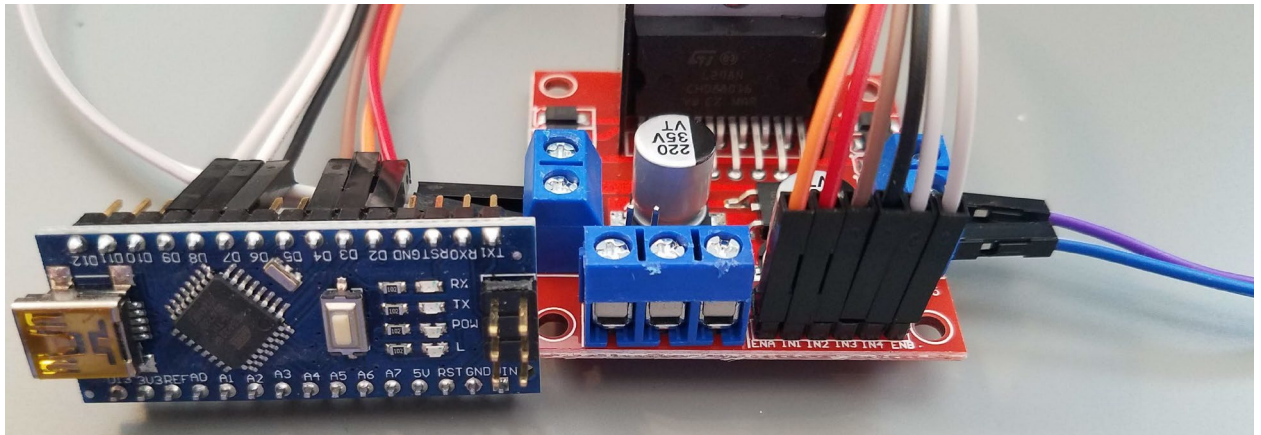
iv)

b) Connect Arduino to motor driver

i) Port Connection table below maps the Arduino Ports to the Motor driver ports. As you go write down the color of the cable used so you can check if later if there are problems or something falls out.

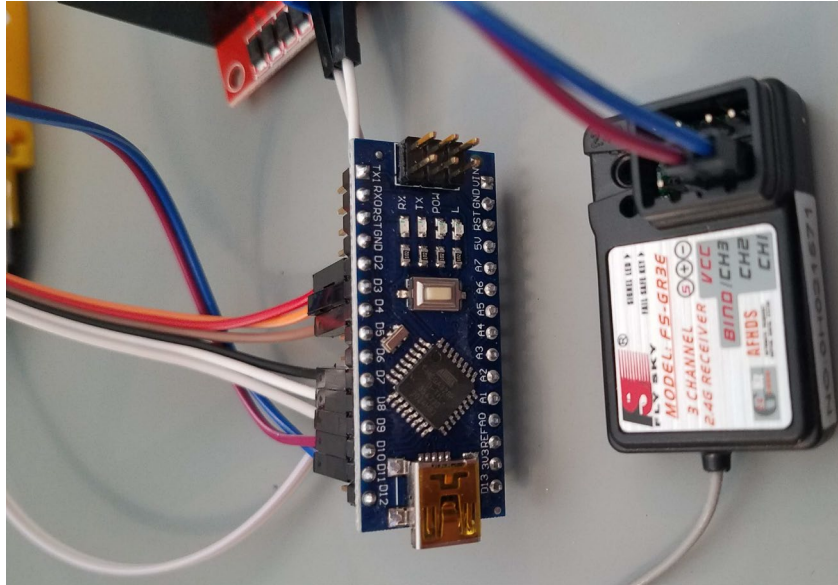
Arduino Port ID	Motor Driver Port ID	Wire Color
D2	IN 1	
D3	ENA	
D4	IN 2	
D7	IN 3	
D8	IN 4	
D9	ENB	

ii) In my image below the colors are orange ENA, yellow IN1, Brown IN2, Black IN3, White IN4, Gray ENB



c) Connect Receiver to Arduino

- i) Channel 1 signal pin connects to Arduino D11 Wire Color used _____
- ii) Channel 2 signal pin connects to Arduino D10 Wire Color used _____

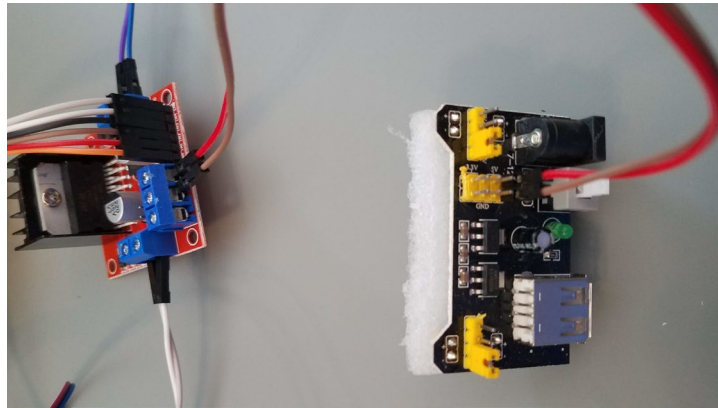


iii)

d) Connect Power cables

i) Motor Driver to Bread board Power Supply

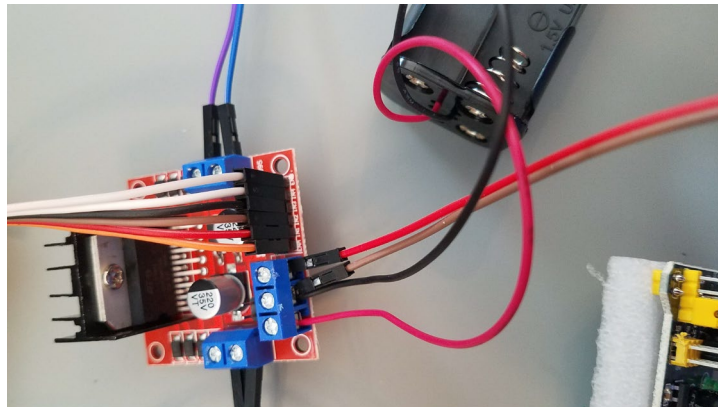
(1) Ground to Ground and 5V to 5V



(2)

ii) AA battery pack to Motor Driver

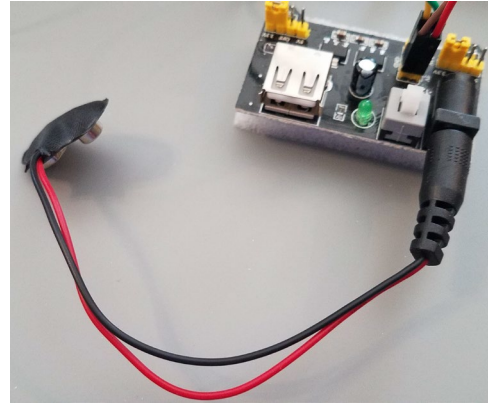
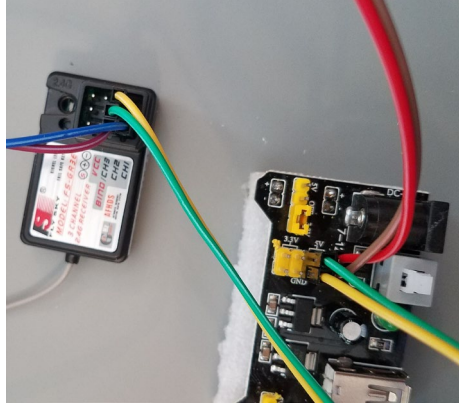
(1) Black to Ground and Red to 12V



(2)

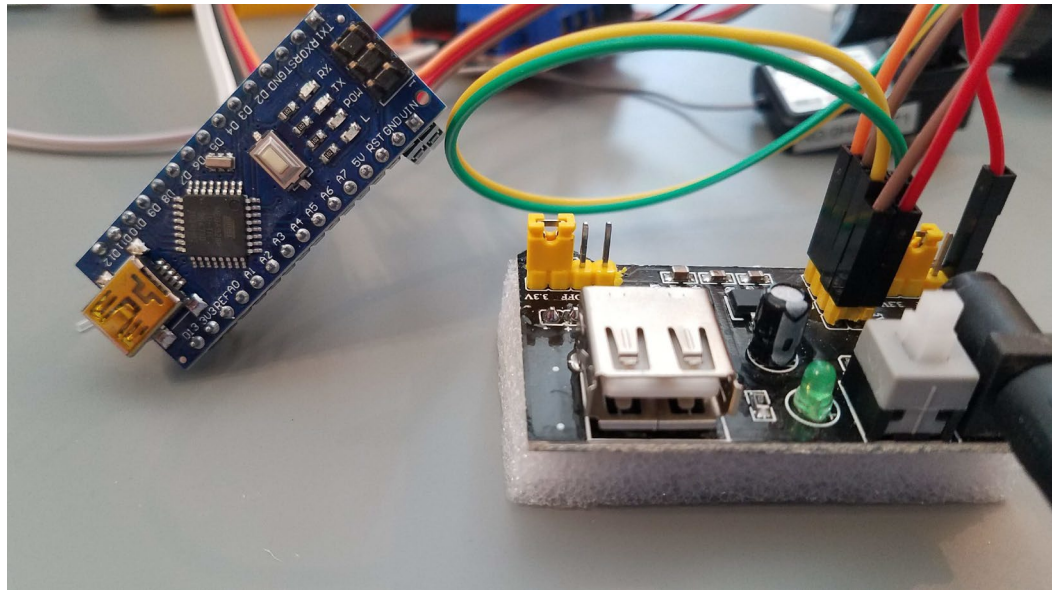
(3) Note black from AA battery Pack shares a terminal with ground from the Bread Board Power Supply

- (4) Tighten 3 power terminals on the motor driver
- iii) Receiver to power supply
 - (1) Channel 2 + to power supply 5V Wire Color _____
 - (2) Channel 2 – to power supply ground Wire Color _____
 - (3) Install 9V power cable



(4)

- iv) Arduino to power supply
 - (1) Arduino Vin to 5V on power supply Wire Color _____
 - (2) Arduino Ground to ground on power supply Wire Color _____
 - (3) Arduino Ground to ground on power supply Wire Color _____
 - (4) Note there are two ground wire attachments on Arduino be sure both are connected.
(One is next to Vin and one next to D2 port)



(5)

- v) Install batteries.
- 2) Test Circuit
 - a) Turn on power White button on Power supply
 - b) Turn on Controller test throttle and steering
 - c) Turn off controller and power supply
- 3) Install parts in Bot
 - a) Cut 3M strips and use Velcro to attached motors to frame and secure batteries

- b) You can also use 3M strips to secure some of the electronics.
 - c) Install wheels
 - d) Power on bot and controller and test that it drives straight and turns. (Note there is currently no reverse enabled in the code but the motors are powerful enough to rotate the bot when against a wall.)
- 4) Trouble Shoot
- a) If one wheel goes in reverse when you pull the throttle reverse the wires on that motor where they connect to the motor driver.
 - b) If the bot turns one way and not the other check the gain on the steering on the controller
- 5) Additional improvements
- a) When you have the internal component locations complete add a hole to the lexan top so you can insert a screwdriver to turn the power on and off.
 - b) Improve code to include forward and reverse
 - c) The controller has a 3rd channel with a button on the handle labeled CH 3. This could be used to add on/off functionality to an active weapon instead of just the passive wedge weapon.
 - d) What else could you improve?