

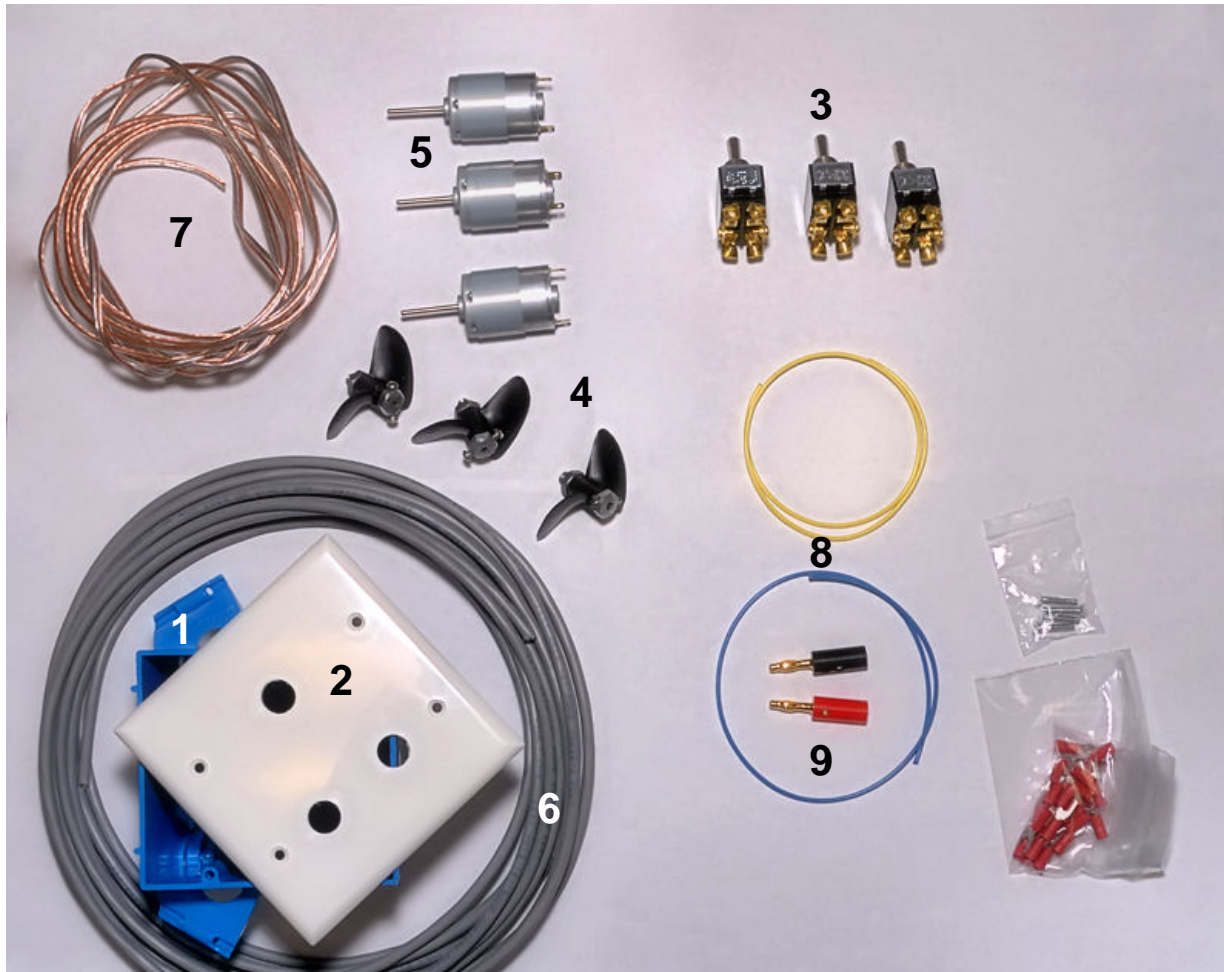
Tool Inventory

These are a few of the tools that are handy to bring!

1. Wire strippers
2. Wire Crimpers
3. Pliers
4. Flat head screwdriver
5. Phillips head screwdriver

A few other helpful tools and supplies are listed as well-

- Ruler
- Marker
- Pencil
- Safety Goggles



Kit Inventory

These are a few of the tools that are handy to bring!

- 1.Blue Gang Box
- 2.Nylon Switch plate
- 3.3 switches
- 4.3 props
- 5.3 motors
- 6.Grey tether cable
- 7.Gold power cable
- 8.Wire (2 colors) for switches
- 9.2 banana plugs
- 10.Stickers (to label the switches and the motors) not pictured



Cut blue and yellow wire into 3 inch pieces. Strip the end of each piece.
These pieces will be used to cross wire the switches.

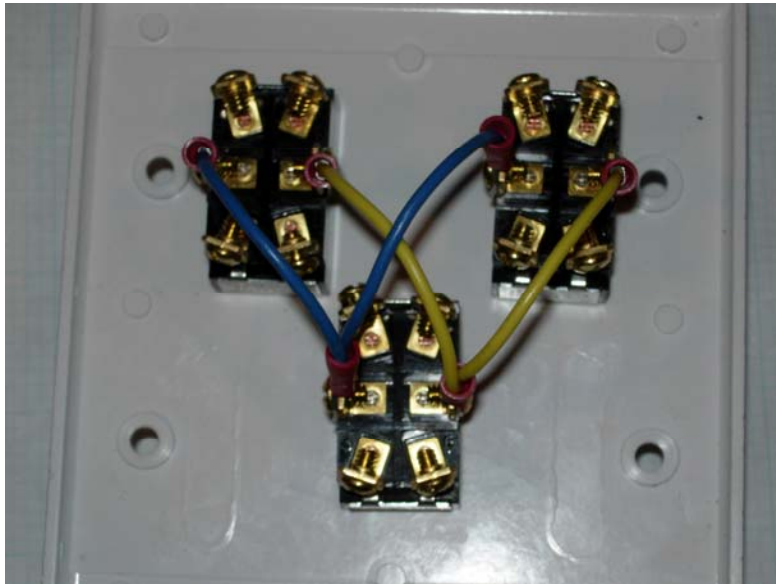


Mount your 3 switches into the white cover plate.

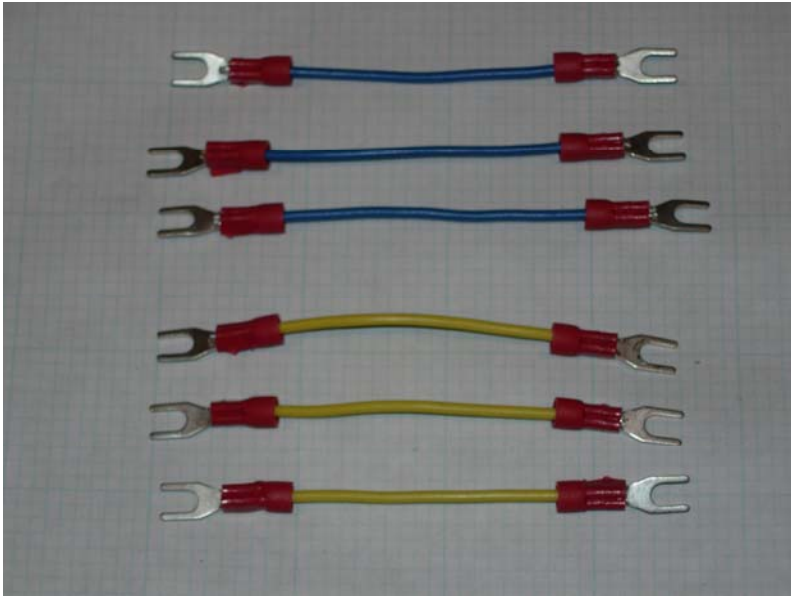


Using 2 wires, crimp 3 fork connectors on the ends (2 will be sharing on of the forks).

When you crimp, make sure there is no bare wire showing between the red end and the wire casing. Also, do not break through the plastic with your tool.

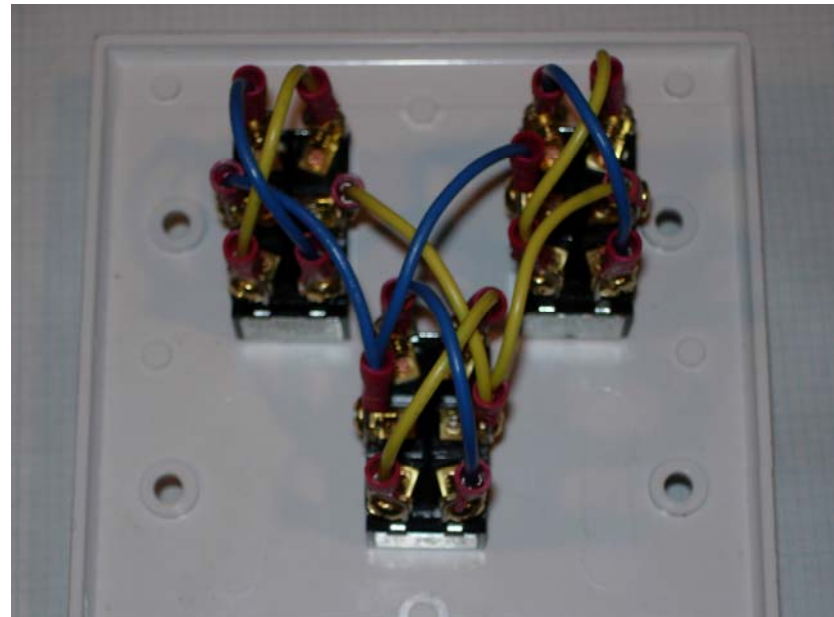
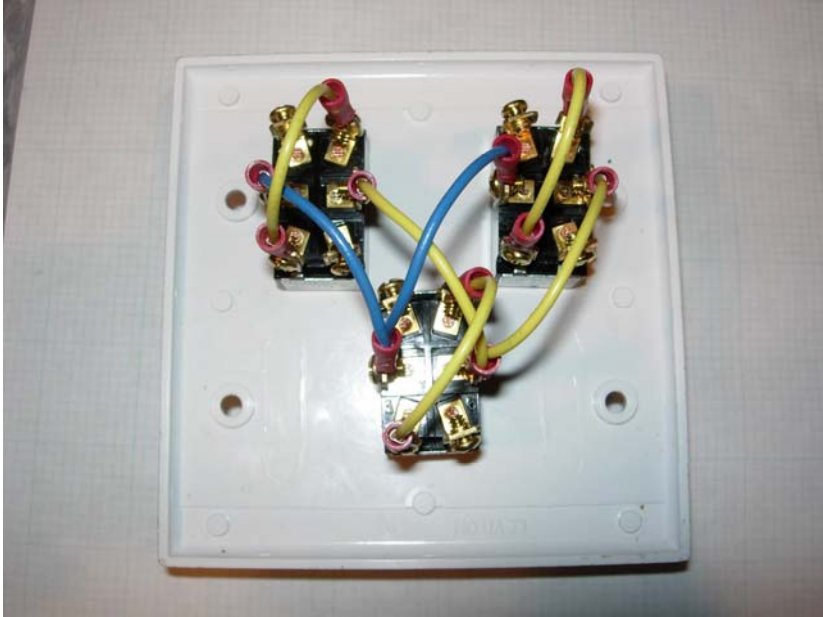


Install them into the switches as shown. Make sure you install the forks on the same side on all 3 switches. If you look closely, all 3 blue forks are attached to the left hand middle post.



Crimp a fork connector onto the ends of 6 of the wires.

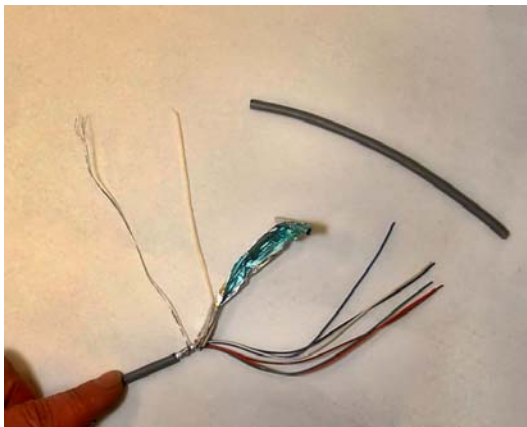
Install them on the switches as shown. Make sure the same color is arcing in the same direction on each switch.



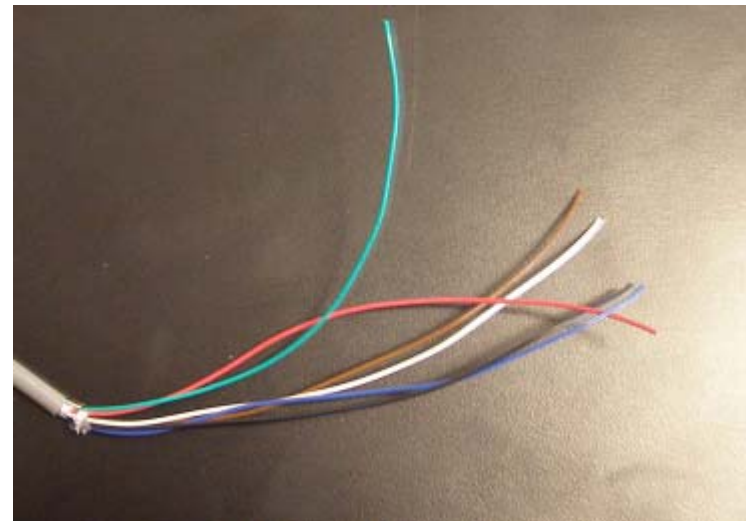


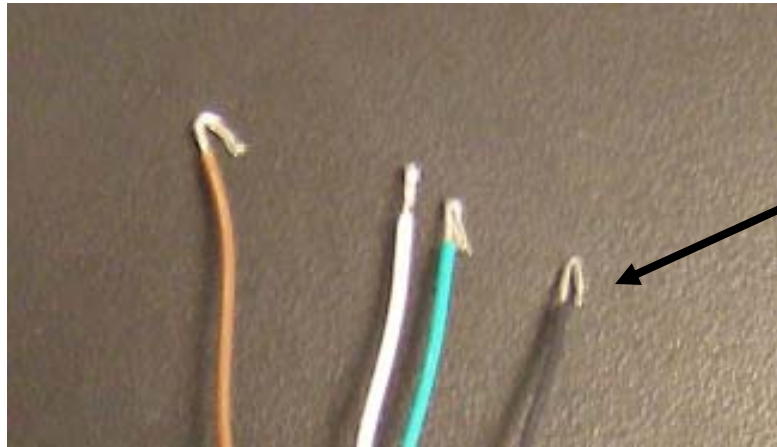
Take the Grey 6 stranded cable and strip both ends. On one end, you will need to pull back the grey casing at least 12 inches, maybe more depending on your motor placement. These bare ends will be twisted into the ends of the motors and soldered later. No fork ends will be added on the 12 inch end.

On the other end, strip about 6 inches. The 6 inch end will be separated, forks are added, and screwed onto to the switches.



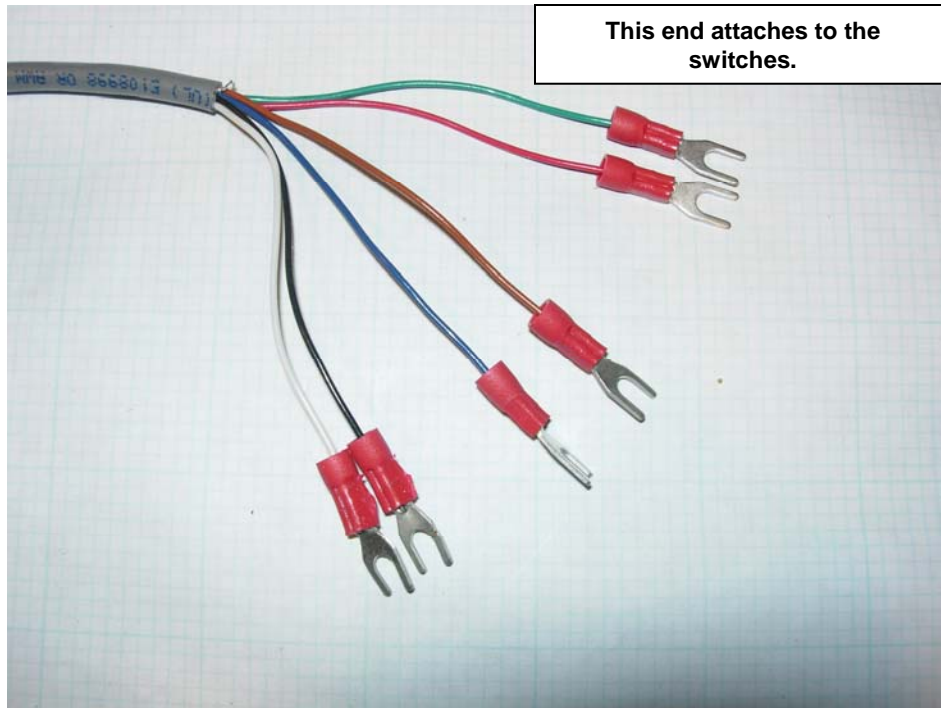
When you open the casing you will see 6 wires, a string and a foil strand. You can cut away the string and foil

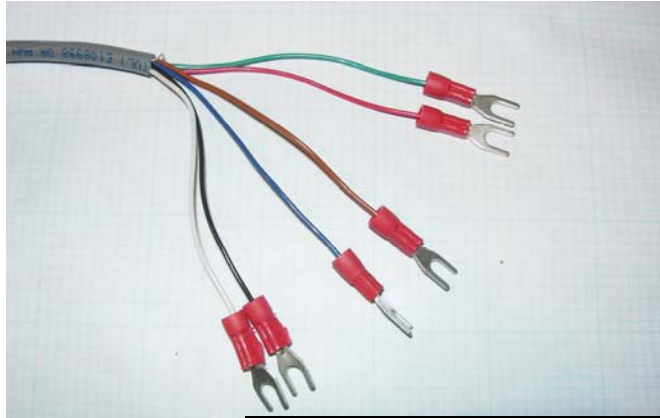




Hint- if you strip a full inch off the end and fold the wire over onto itself (making it a ½" long) it will crimp into the end easier because its thicker!

You will need to create pairs for the wires- 2 for each motor. You must be sure the same colors are paired for the motors as are paired on the switches. The color pairs easy to remember are- **Brown/Blue**, **Black/White**, **Red/Green**

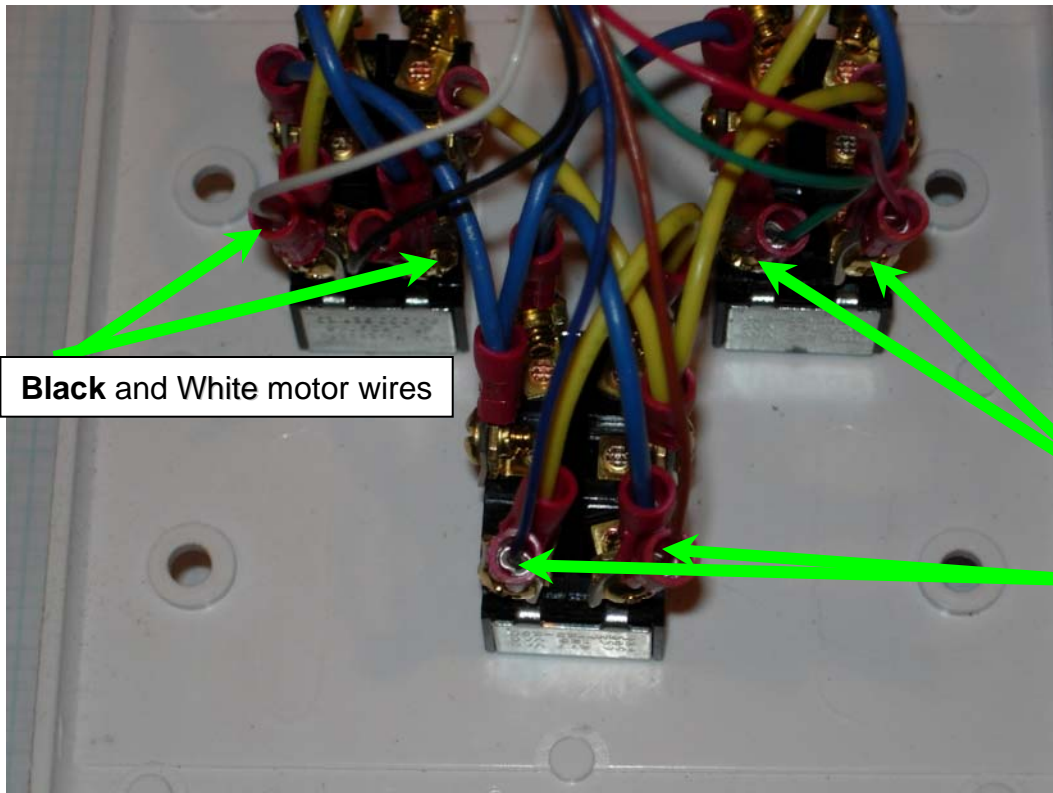




This end attaches to the switches.

After you have them paired, you will add the forked wires onto the switches at the bottom posts of the switch. If you look really close at the diagram at the bottom-left you will notice the **brown** and **blue** wire on the bottom switch- bottom post, the **black** and **white** on the bottom posts on the left and **red** and **green** on the bottom posts of the right switch.

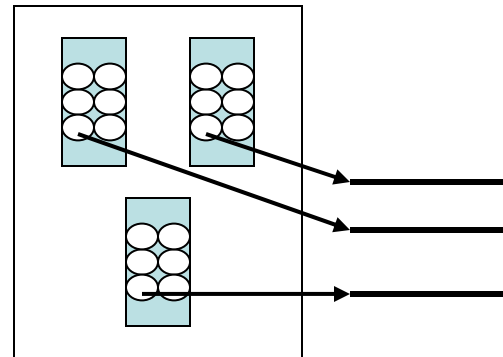
Make a note of which colors are mounted on the left side of the switches. This will be important to having your motors turn the same direction!



Black and White motor wires

Red and Green motor wires

Brown and Blue motor wires

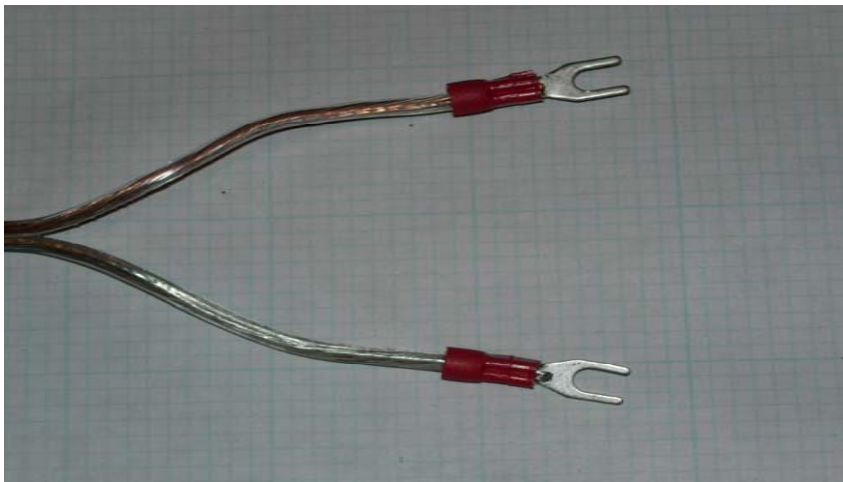




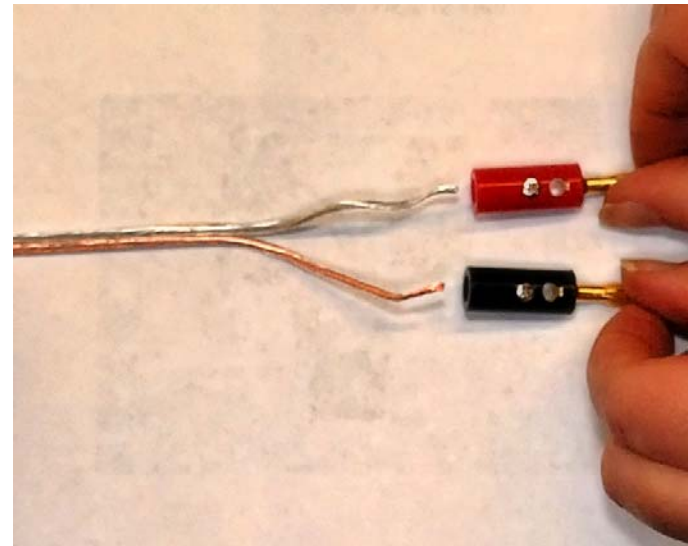
Gold Power Cable- You will split both ends and strip the wire about 1/2".

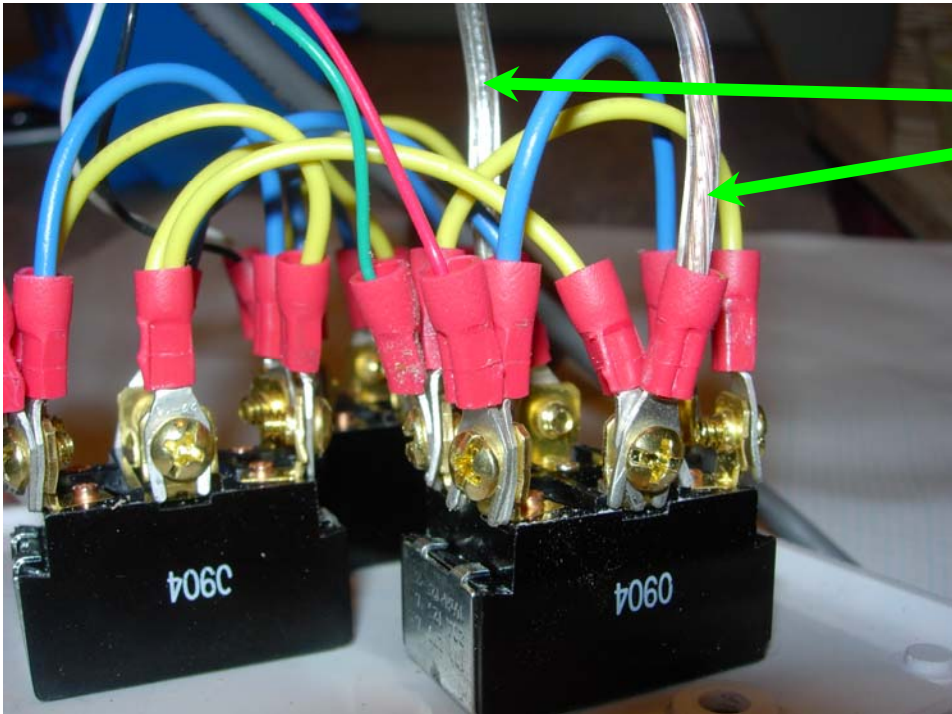
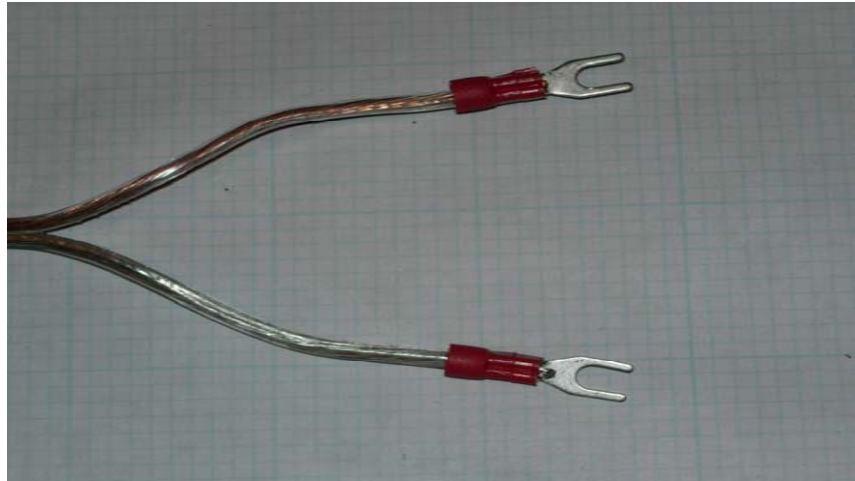
One end attaches to switches, the other to the banana plugs to use with the battery
The fork ends will be attached to the switches to give them power. You will attach the fork ends to the middle terminal of ONE of the switches. It does not matter which switch gets attached to the power because all of them are linked by the yellow and blue wire.

This end attaches to switches



This end gets banana plugs to plug into power source

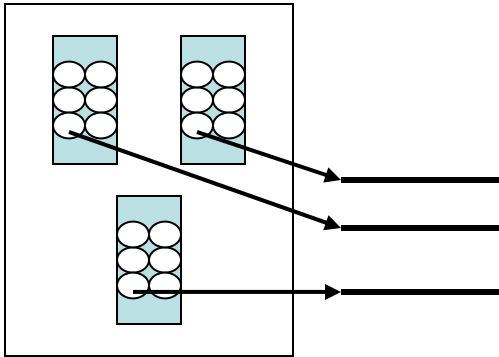




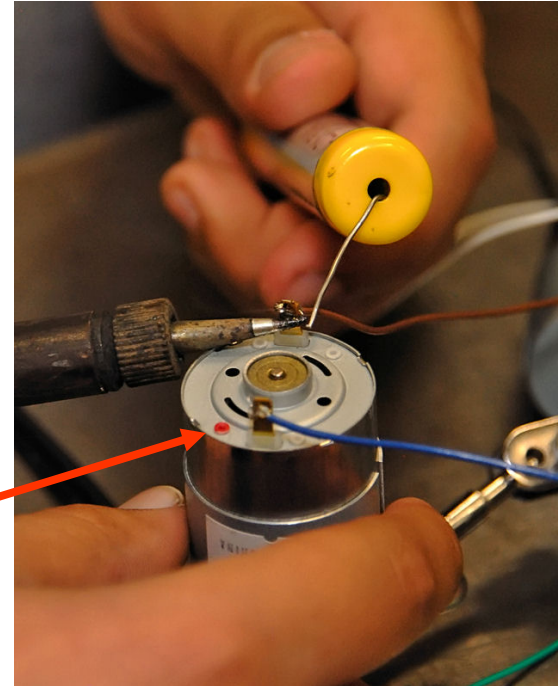
The power cable is attached to the middle post of ONE of the switches. After attaching, check all connections before closing the lid!

Almost Done! Solder your connections with adult supervision!

Solder each of the wires on the motors (strip half an inch off each end)
Remember the color pairs must be the same as you did for the switches- **Brown/Blue**, **Black/White**, **Red/Green**



Remember this chart from page 8? When you solder the wires to the motors, make sure the wire that was mounted on the left post is the same color wire that is mounted on the motor post with the **red dot**. This will make sure that all your motors have the same polarity (+ and - end) so they spin the same direction when all switches are pushed in the same direction!



Last Step Test your motors!

1. Ask one of the engineers to hook you up to a battery
2. Test each of your motors.
3. Using the color stickers in your kit to label which switch powers which motor