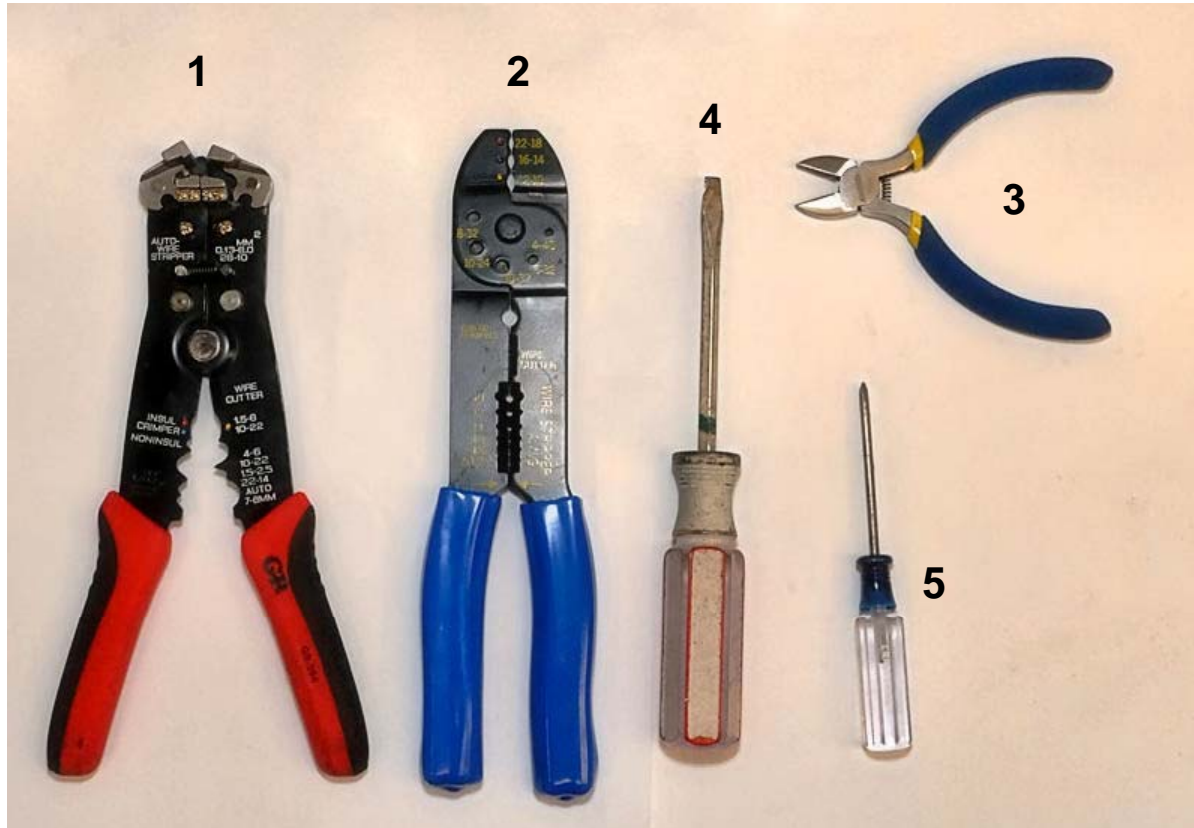


SCOUT class ROV kit (crimp) wiring instructions



Tool inventory

These are a few of the tools that you'll need:

1. Wire strippers
2. Wire crimpers
3. Wire cutters
4. Flat-head screwdriver
5. Phillips head screwdriver
6. Large Ziploc baggie
7. Needle-nose pliers (not shown)
8. Soldering iron (not shown)
9. Solder (not shown)

These tools and supplies are helpful as well:

- Ruler
- Marker
- Pencil
- Safety Goggles
- Paper to take notes



Kit inventory

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. Fork connectors
11. Screws (to hold control box together)
12. Stickers (to label the switches and the motors) are not pictured

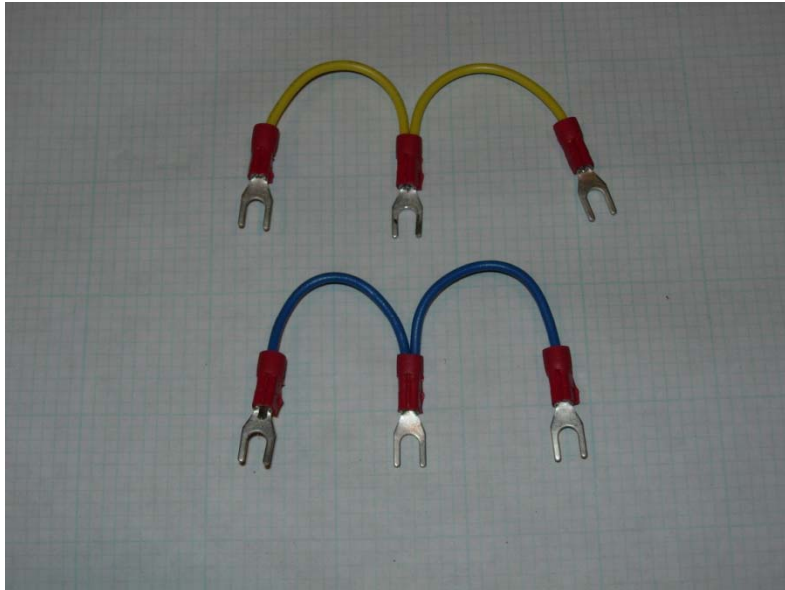
***Important note:** Your cable may have 6 or more wires. You will only need 6 wires (3 pairs) for this wiring exercise. Any additional wires are “extra” and can be taped and left aside. Also, the colors of your wires may vary from the photos/descriptions presented in these instructions.



Cut the blue and yellow wire into 3-inch pieces. Strip $\frac{1}{4}$ -inch off the end of each piece. These pieces will be used to cross wire the switches.

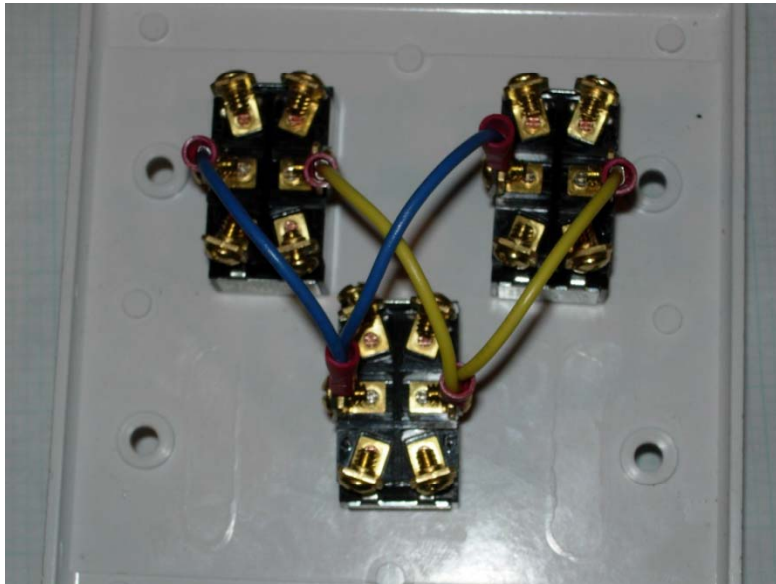


Mount your 3 switches onto the white cover plate of your control box. Make sure to remove both nuts from the switch before mounting and use both nuts to help secure the switch on the "top" (front) of the cover plate.

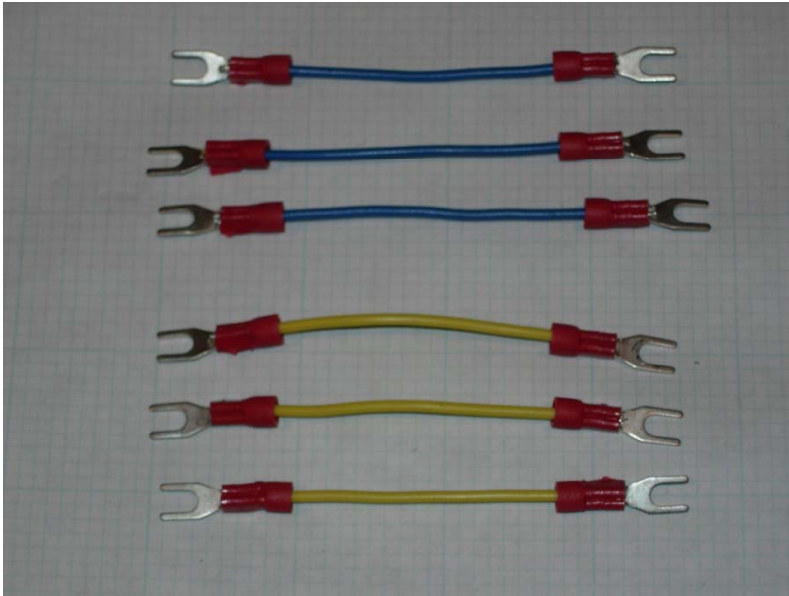


Crimp 3 fork connectors onto the ends of 2 wires, noting that 2 of the wires will be sharing one of the forks.

Note: When you crimp, make sure there is little-to-no bare wire showing between the red end and the wire casing. Also, take care not to break through the plastic with your tool. If you do, cut the crimp from that end of the wire and start over (you can start over with the same wire).

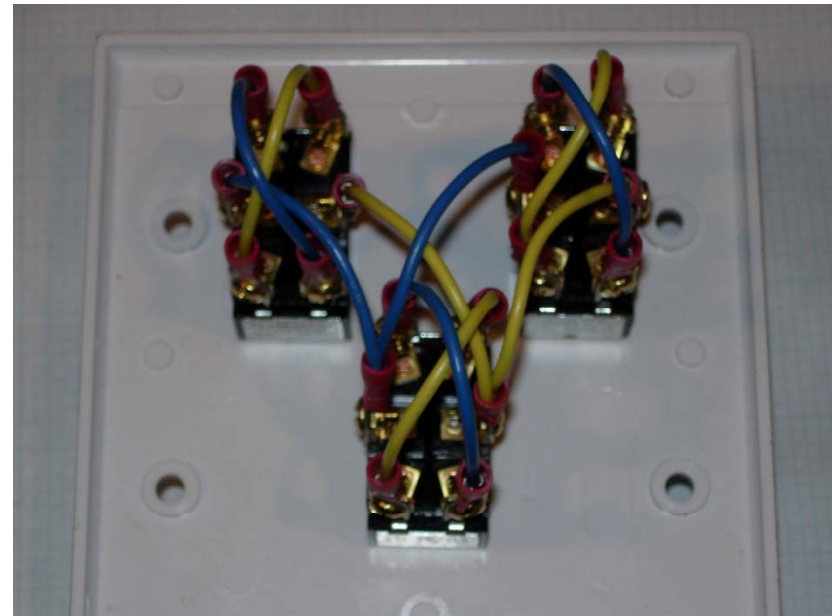
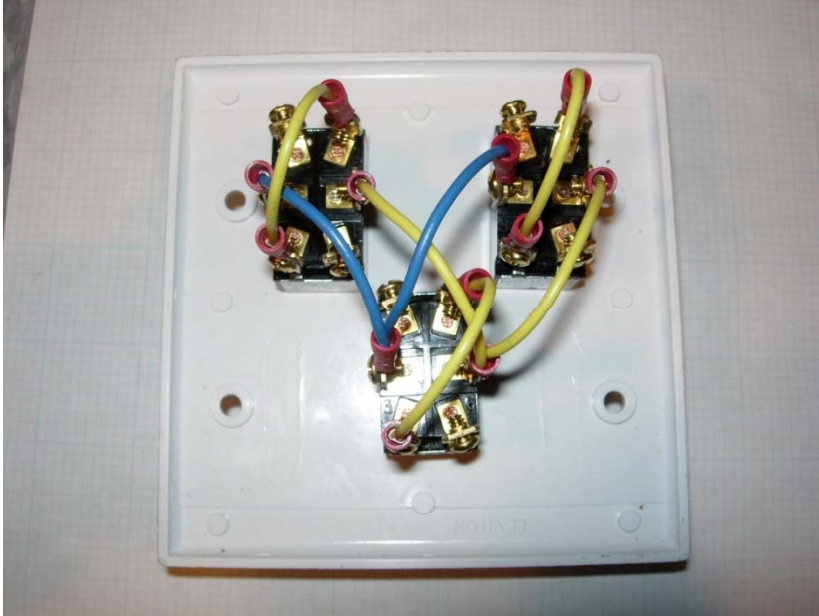


Install the wires onto the switches as shown. Make sure you install the forks on the same side on all 3 switches. If you look closely at the photo, all 3 blue forks are attached to the left-hand middle post. It is also helpful to install the forks so that the “flat” side of the fork connector is facing outward. You will see the reason for this later in the instructions.



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

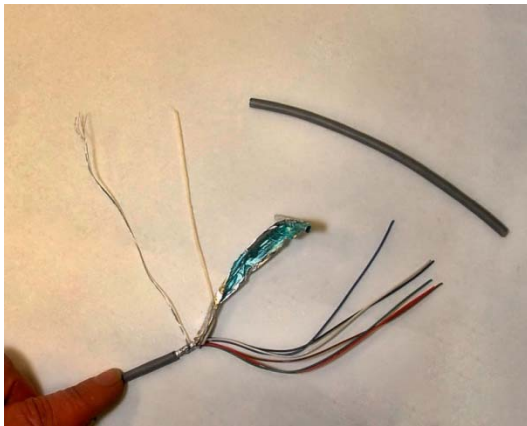
Install them onto the switches as shown. Make sure that the same color is arcing in the same direction on each switch.



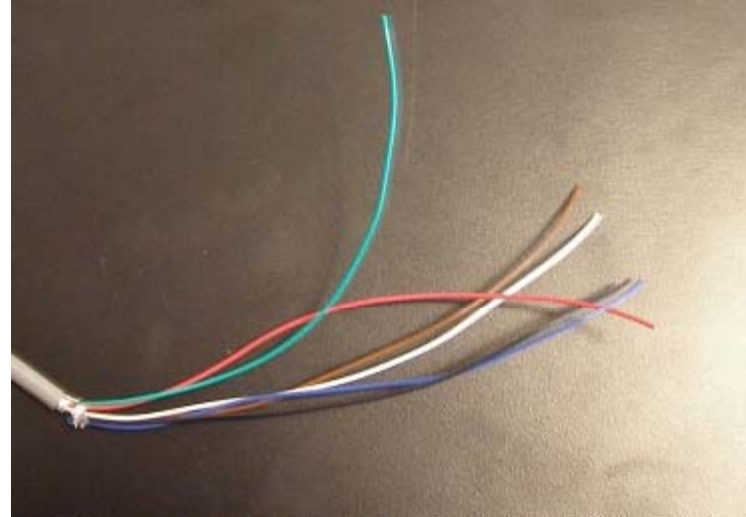


Take the grey 6-stranded cable and strip 6 inches of the grey casing from both ends. One end will be twisted onto the ends of the motors and soldered later on.

On the other end, separate the wires into individual strands. Next feed this end (and all of the wires) into your control box. You can do this by bending and/or removing one (or more) of the plastic tabs/panels on the control box. Once it's in the control box, you may want to tie an overhand knot in the cable to provide "stress relief."

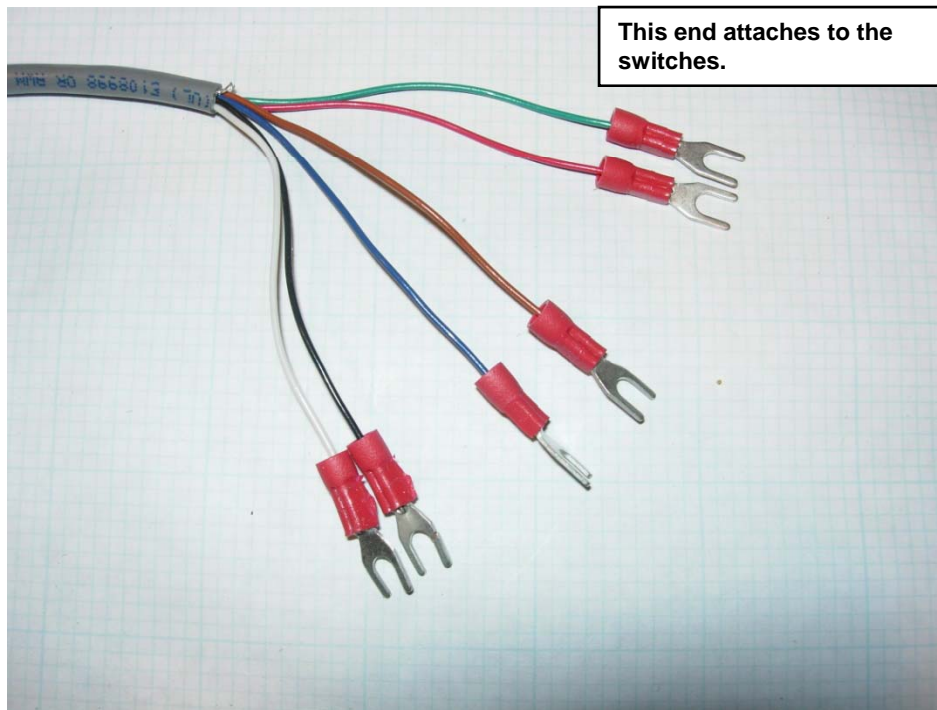


When you open the casing, you will see 6 wires, a string, and a foil strand. You can cut away the string and foil.



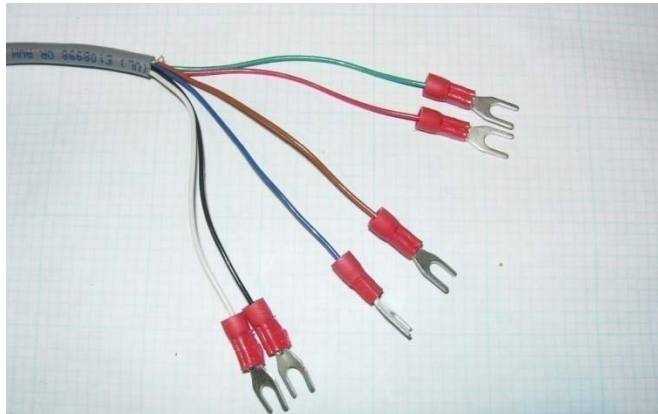


Strip less about $\frac{1}{2}$ inch from each strand of wire then fold it over onto itself (making it about $\frac{1}{4}$ -inch long). This will make it easier to crimp. Add a fork connector to the end of each wire.



You will need to create pairs of wires (so that you have 2 wires for each motor). You must be sure that 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**.

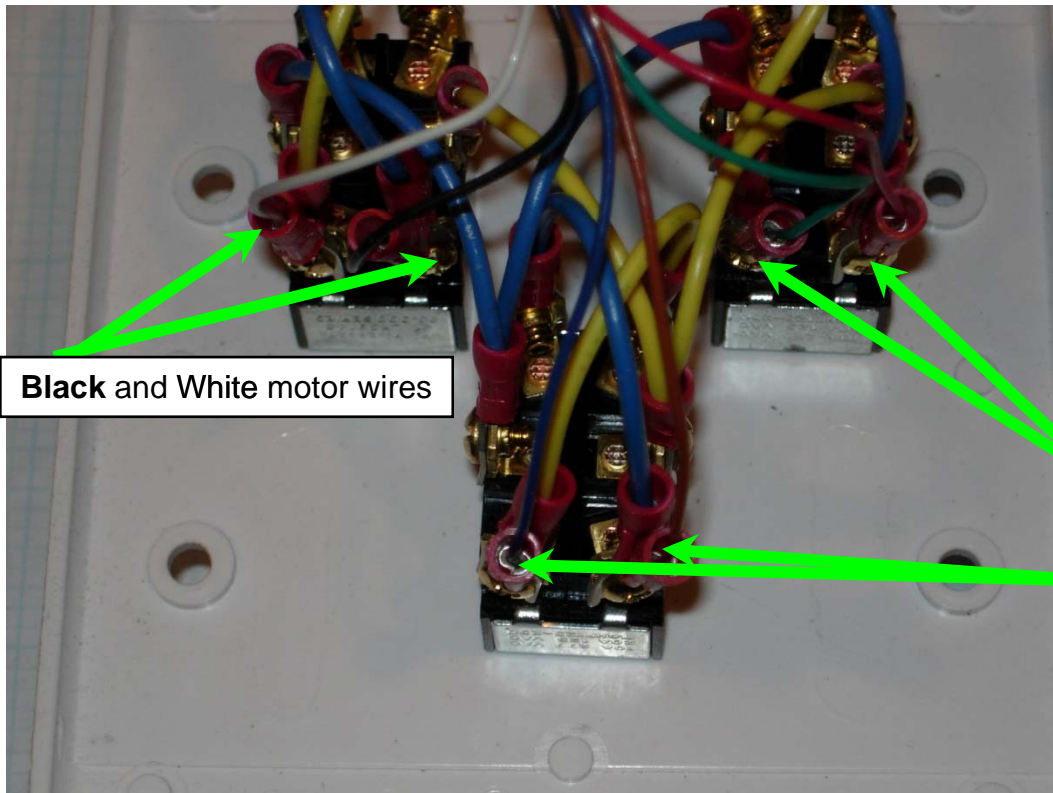
Note: Remember, the colors of your wires may be different. Come up with pairs of colors that make the most sense to use (school colors, colors of your favorite sports team, etc.).



This end attaches to the switches.

After you have them paired, you will install the forked wires onto the bottom posts of each switch. Use the photo on the bottom left to guide you.

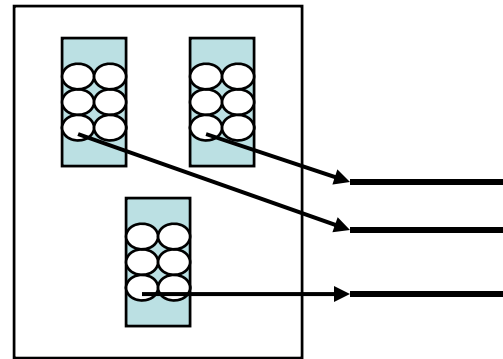
Use the diagram below to note which colors are mounted onto the left side of the switches. This will be important to having your motors turn the same direction!



Black and White motor wires

Red and Green motor wires

Brown and Blue motor wires



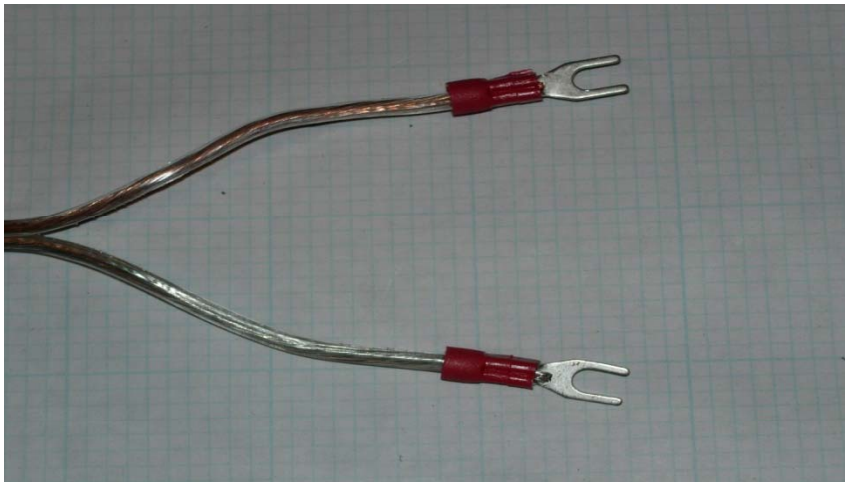


Split both ends of the gold power cable into two wires. You'll notice that one wire is actually gold (or bronze) while the other is silver. Strip off about ½-inch of the casing on each wire.

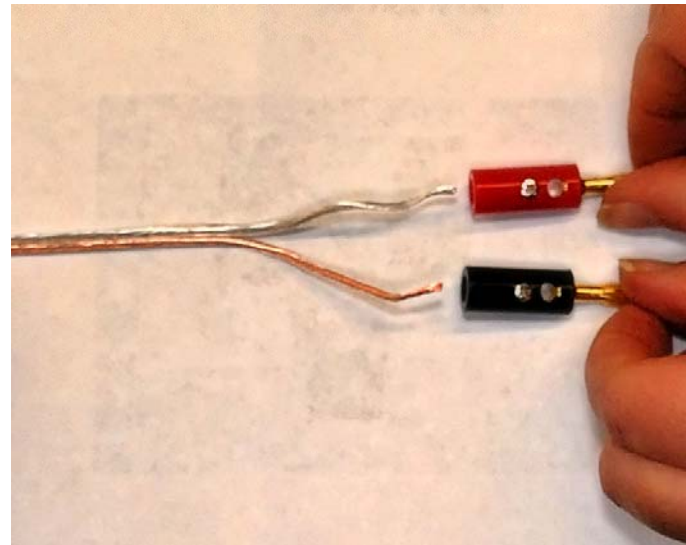
One end will attach to banana plugs, which will connect to the battery.

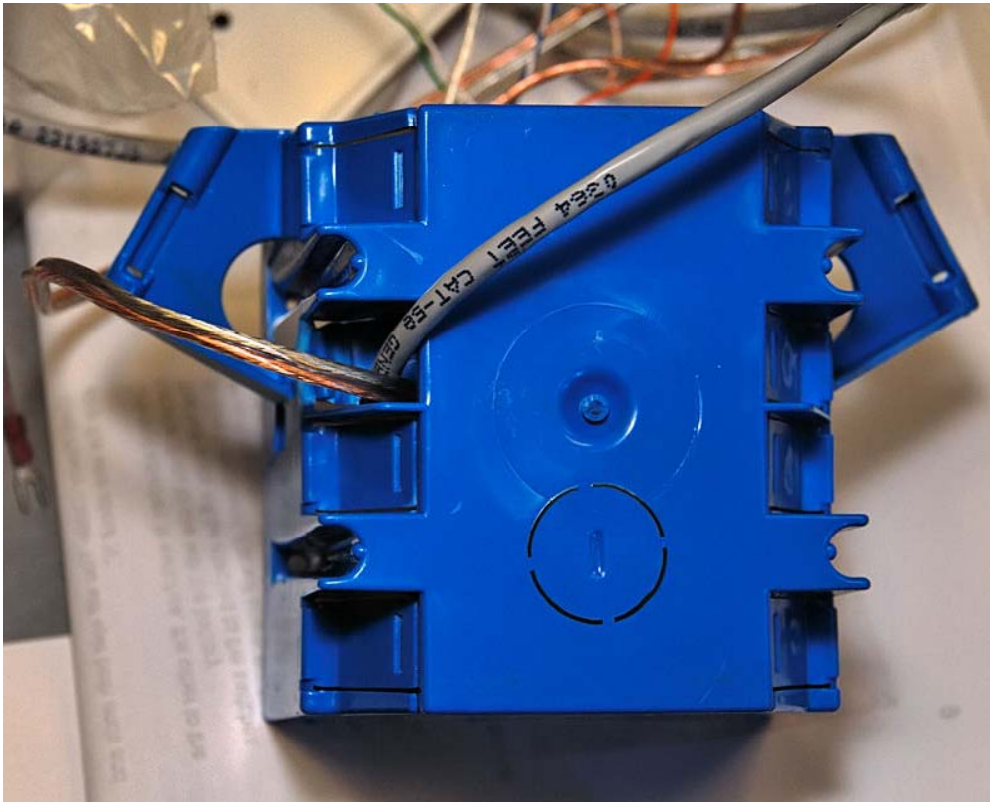
Attach a fork connector to each wire on the other end of the power cable. These wires will attach to the switches to provide the switches with power from the battery.

This end attaches to switches.

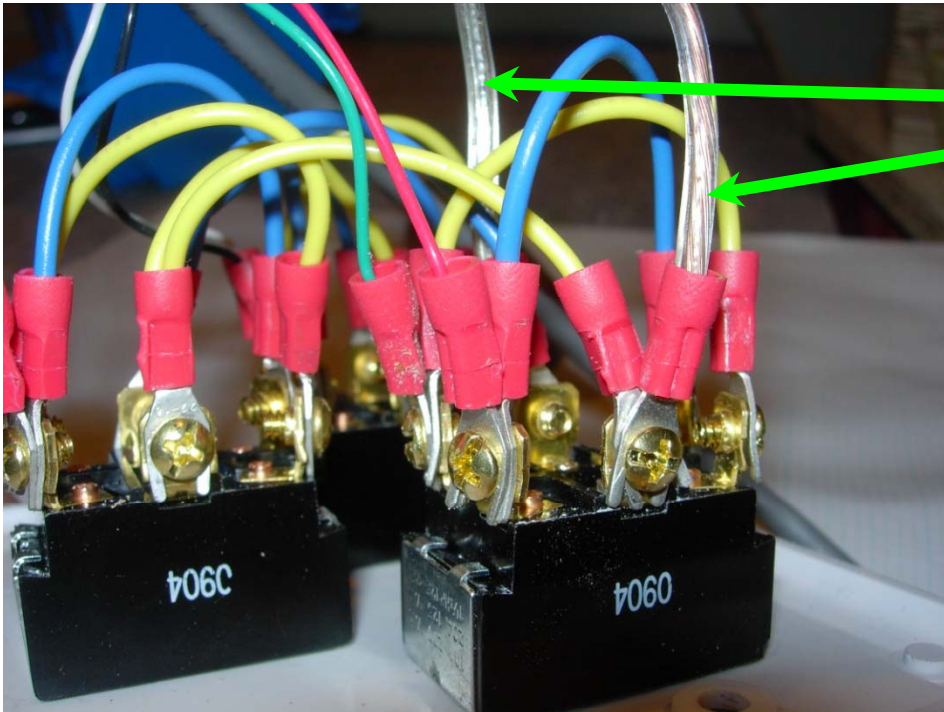
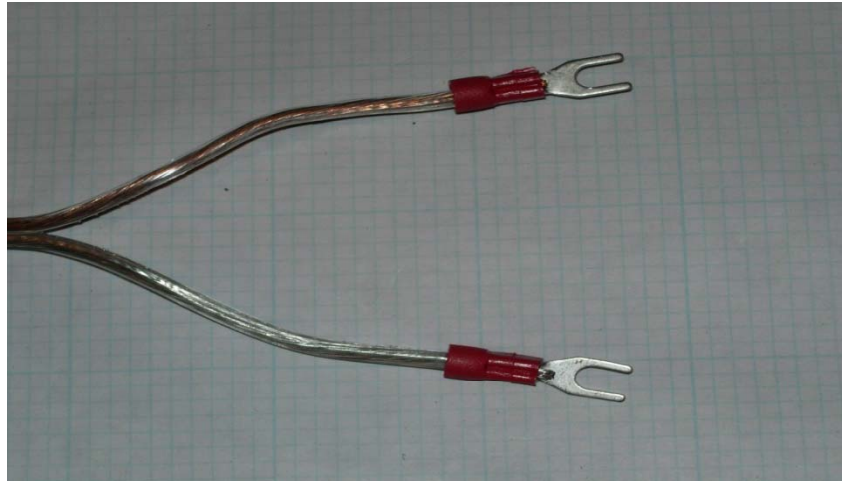


This end gets banana plugs to plug into power source.





Feed the forked end of the power cable into your control box. You can do this through the same hole that you used to thread the wires for the switches or you can use a different hole. Once it's in the control box, you may want to tie an overhand knot in the power cable to provide "stress relief."



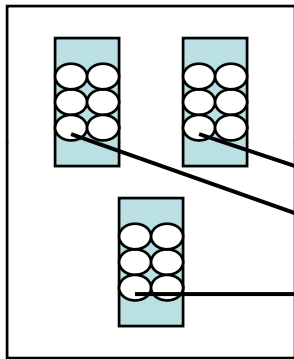
Attach the forks to the middle terminals of ONE of the switches. It doesn't matter which switch gets attached to the power because all of them are linked by the yellow and blue wire. Installing the "flat" side of the fork to the "flat" side of the fork connector that you installed earlier makes it easier to do and makes for a better connection.

In the photo at left, the power cable is attached to the middle post of ONE of the switches. The silver wire attaches to the middle post with the yellow wire and the gold wire attaches to the middle post with the blue wire. Before using the screws to attach the cover plate, check all connections!

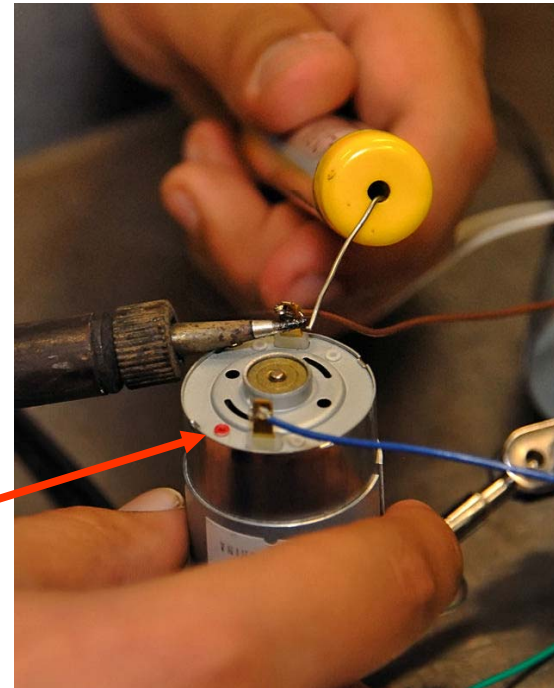
You're almost done!

Solder each of the wires of the other end of the power cable onto the motors. If you don't have experience soldering, ask a teacher or mentor for help.

Remember the color pairs must be the same as you did for the switches – **Brown/Blue**, **Black/White**, **Red/Green**.



Remember the chart that you created on page 8? When you solder the wires to the motors, make sure that 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 -) so that they spin the same direction when all switches are pushed in the same direction!



Last step – test your motors!

Connect the banana plugs to a battery. Ask a teacher or mentor to help you if you're not familiar with how to do this. Test each of your motors to make sure that the propellers are spinning. Using the colored stickers (or colored markers), label which switch powers which motor.