

Propulsion System: Connecting the tether to the motors

Connecting the three motors (2 wires each)
to the six colored wires of the tether.





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This material is based upon work supported by the National Science Foundation under Grant Numbers DRL/ITEST 1312333 and DUE/ATE 1502046.

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PufferFish Color Scheme

| | | Terminal block | Tether wire color | Motor Number and Wire Color |
|---------|------------------|----------------|-------------------|-----------------------------|
| Motor 1 | Left Horizontal | M1A | Green | Black Motor 1 |
| | | M1B | Red | Brown Motor 1 |
| Motor 2 | Right Horizontal | M2A | White | Black Motor 2 |
| | | M2B | Black | Brown Motor 2 |
| Motor 3 | Vertical | M3A | Brown | Black Motor 3 |
| | | M3B | Blue | Brown Motor 3 |

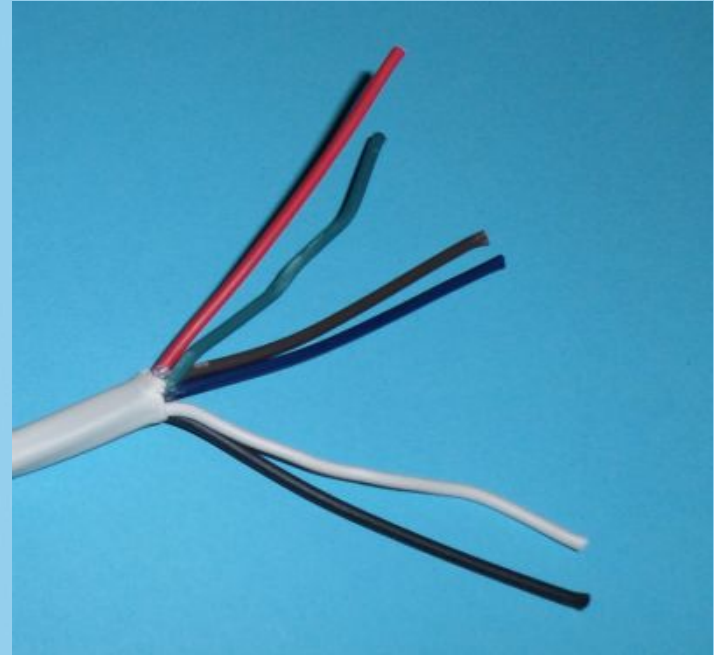
At the top end of the tether, the green tether wire goes into the terminal block MTR1, into M1A. The red tether wire also goes into terminal block MTR1, but into M1B. On the bottom side, the green wire connects with the black motor wire of Motor 1. The red wire connects with the brown motor wire of Motor 1. Motor 1 will be the left horizontal motor.

Rhyming Color Scheme

Black and white is on the right (right motor). Blue and brown is up and down (vertical motor). Red and green are left over (left motor).

Preparing the tether

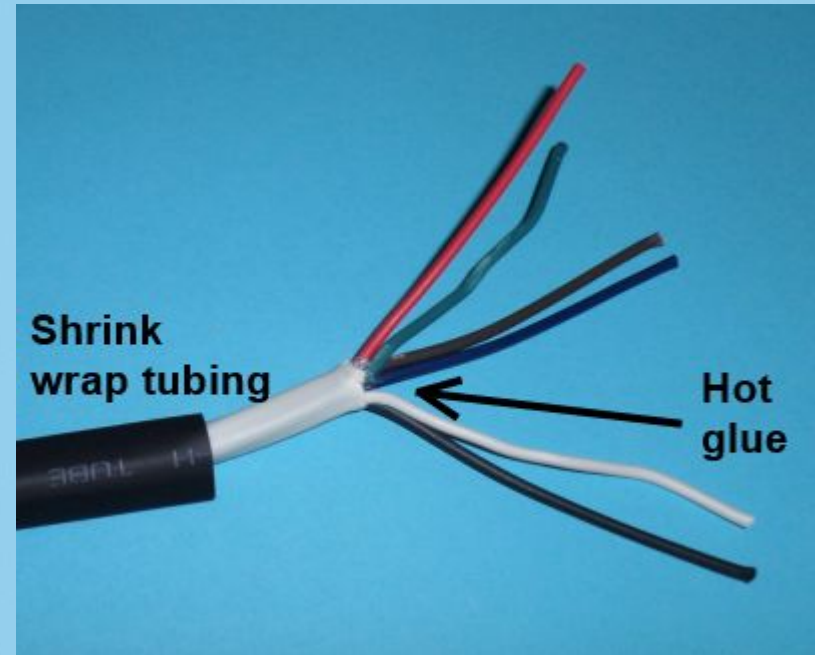
Carefully cut away 5 cm of the outer sheathing of the cable. **DO NOT nick any of the six colored wires inside.** If you do, cut the tether cable where you nicked an inside wire and start again.



Use scissors or wire cutters to make a small cut in just the sheathing on one edge of the cable. Twist and turn the sheathing until the cut opens up. Carefully cut and twist away all the excess sheathing. Cut the string inside, but make sure all six colored wires are still intact.

Waterproofing the tether

All six wires are held in a sheath. This sheath, if not waterproofed, can act as a pipeline for water up to the surface - **AND INTO YOUR CONTROL BOX!**

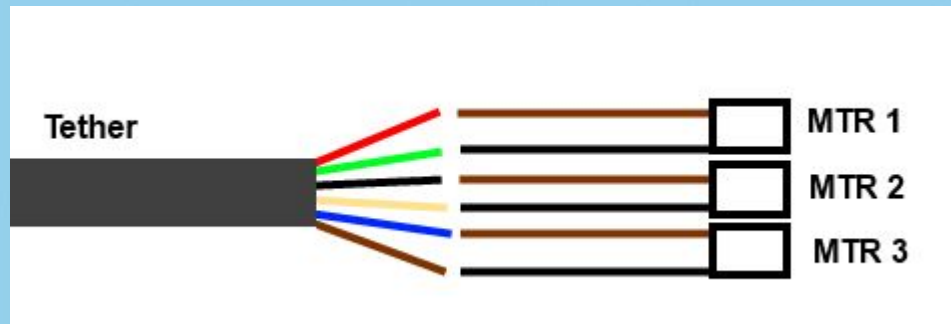


To waterproof the tether, push the 7.5 cm length of black shrink wrap over the tether. Pull apart the six wires and squirt hot glue into opening. Push hot glue as far up into the sheathing as possible. Bring the black shrink wrap over the connection and shrink using a heat gun.

Soldering your motors to your tether.

Cut six 4 cm lengths of shrink wrap and slide them over the six motor wires. Strip 1 cm from the end of the all six motor wires and all six tether wires. Using your PufferFish color scheme (**VERY IMPORTANT!**), solder the six tether wires to the six motor wires. Since this part of the ROV will be underwater, make sure to waterproof all wire connections.

VERY IMPORTANT! Make sure your color combinations on the bottom side match up with the color combinations on the topside. The wires coming off terminal blocks (MTR 1, MTR 2 and MTR 3 - two wires each) should match up (colors) with the motor wires (two wires each).



Complete strain relief and test your motors.

Once you have waterproofed all six connections, position the connections so they are hidden inside the strain relief. Push the two ends of the strain relief together.

Attach the motors to your frame. Motor 1 should be your left horizontal motor. Motor 2 should be your right horizontal motor. Motors 3 should be your vertical motor.



When you connect the top side tether and power up your system, each motor must be tested for polarity (whether it is pushing in the proper direction). Push the left switch forward. Your left motor should be pushing forward (air flow felt behind the motor). If a motor is pushing in the wrong direction, polarity can be changed by switching the wires in the MTR terminal block. Simply switch the two wires between A and B. Re-test the system to make sure that the motors push in the proper direction.

Test all three switches and all three motors.