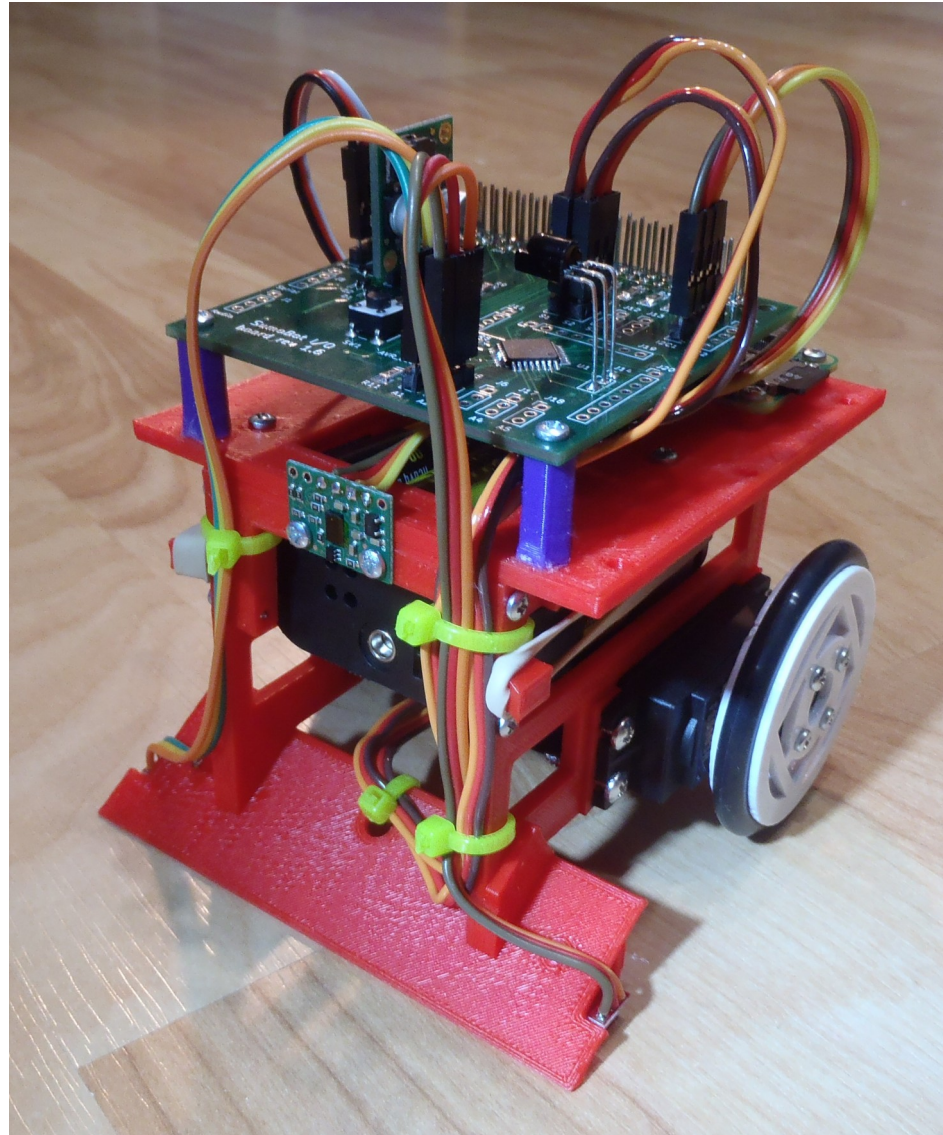
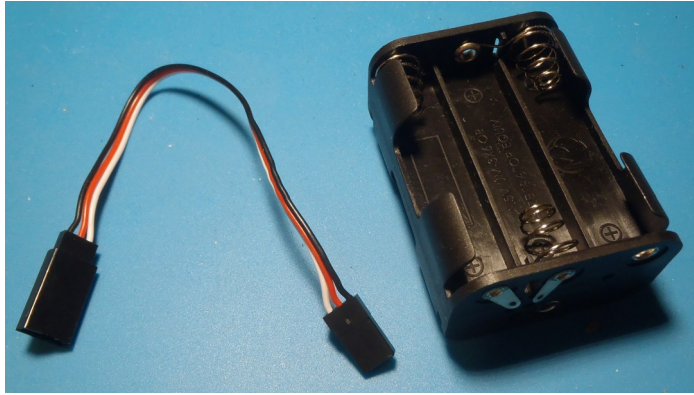


Sumo & Line Following Robot Assembly



Wire Up The Battery Holder

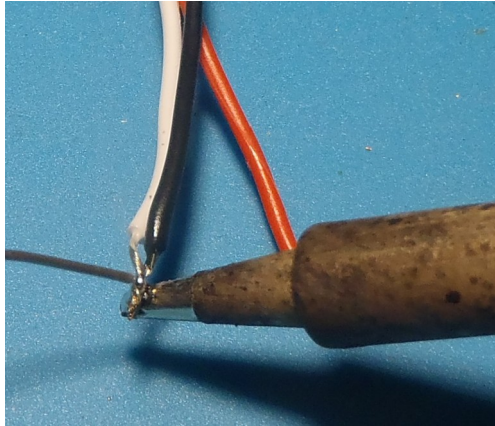


- Parts Needed
 - Battery holder
 - Servo extension cable.

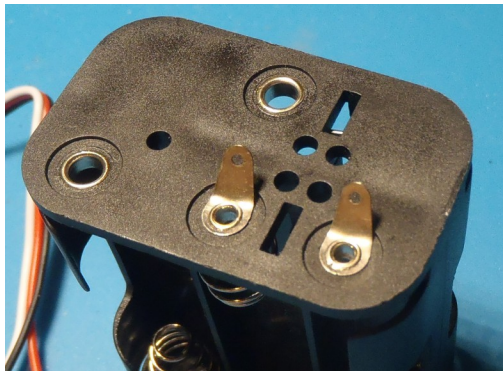


- Cut off the male end of the 3 conductor servo extension cable. It's the larger end with the "box" around it.
- Refer to the picture. **Don't cut off the wrong end!!!**
- Cut as close to the connector shell as possible.

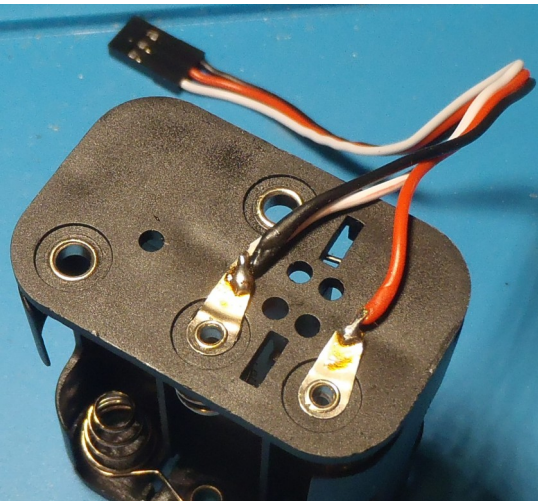
Wire Up The Battery Holder



- Strip and tin the cut end of the wires
- Twist the black and white wires together before tinning them. Bend the tabs on the battery holder up slightly to make it easier to connect the wires.



- Solder the wires to the battery holder as shown in the picture.



- **Make sure the red wire goes to the positive (outside) tab!!!**
- Bend the tabs back down and cover them with a piece of electrical tape.

Chassis Assembly

- Parts Needed

- Chassis

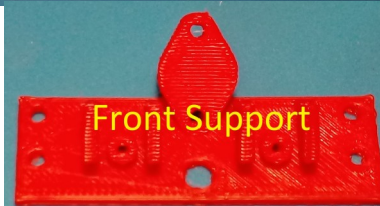
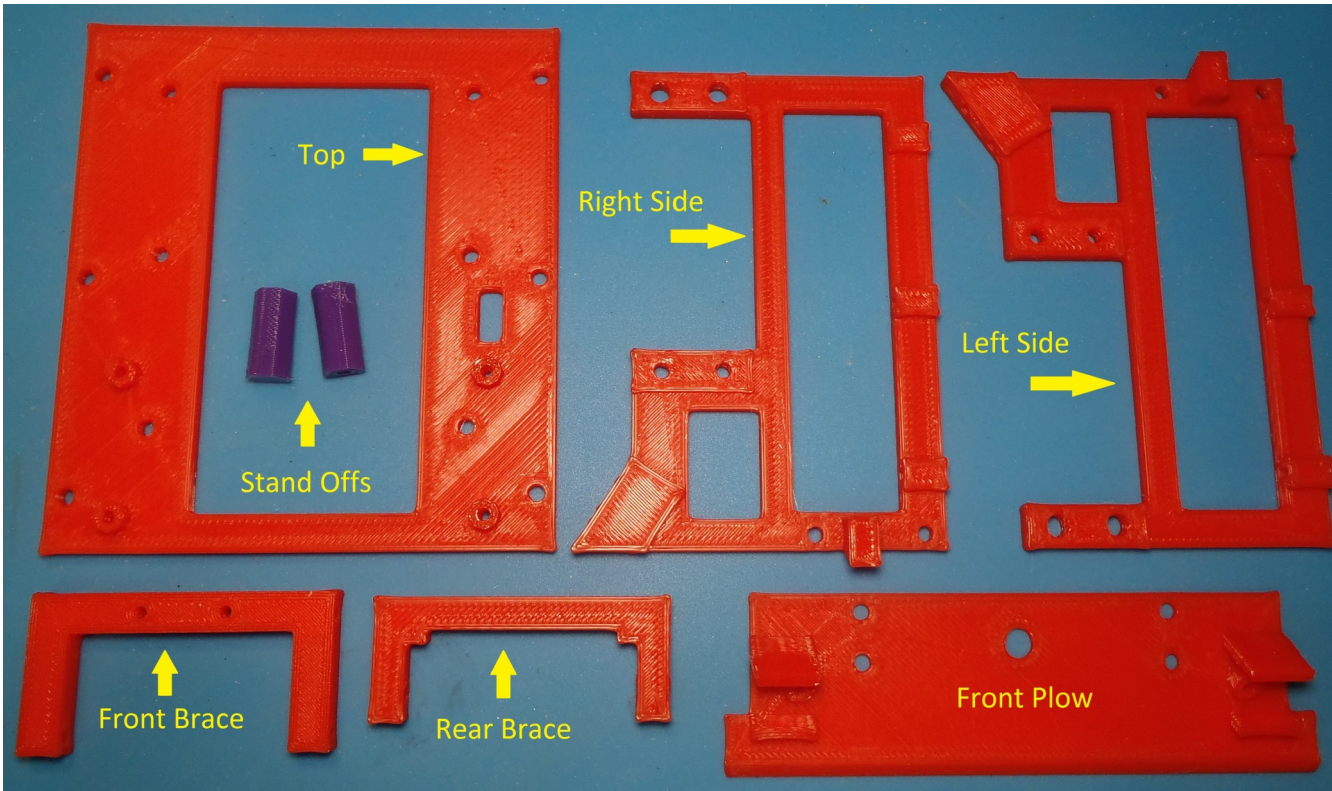
- Top
- Right side
- Left Side
- Stand offs
- Front Brace
- Rear Brace
- For Sumo Bot
 - Front Plow
- For Line Following Bot
 - Front Support
 - Ball caster w/Nuts&Bolts

- Drive Train

- 2x Continuous Rotation Servos
- 2x Wheels
- 2x O-RingTires

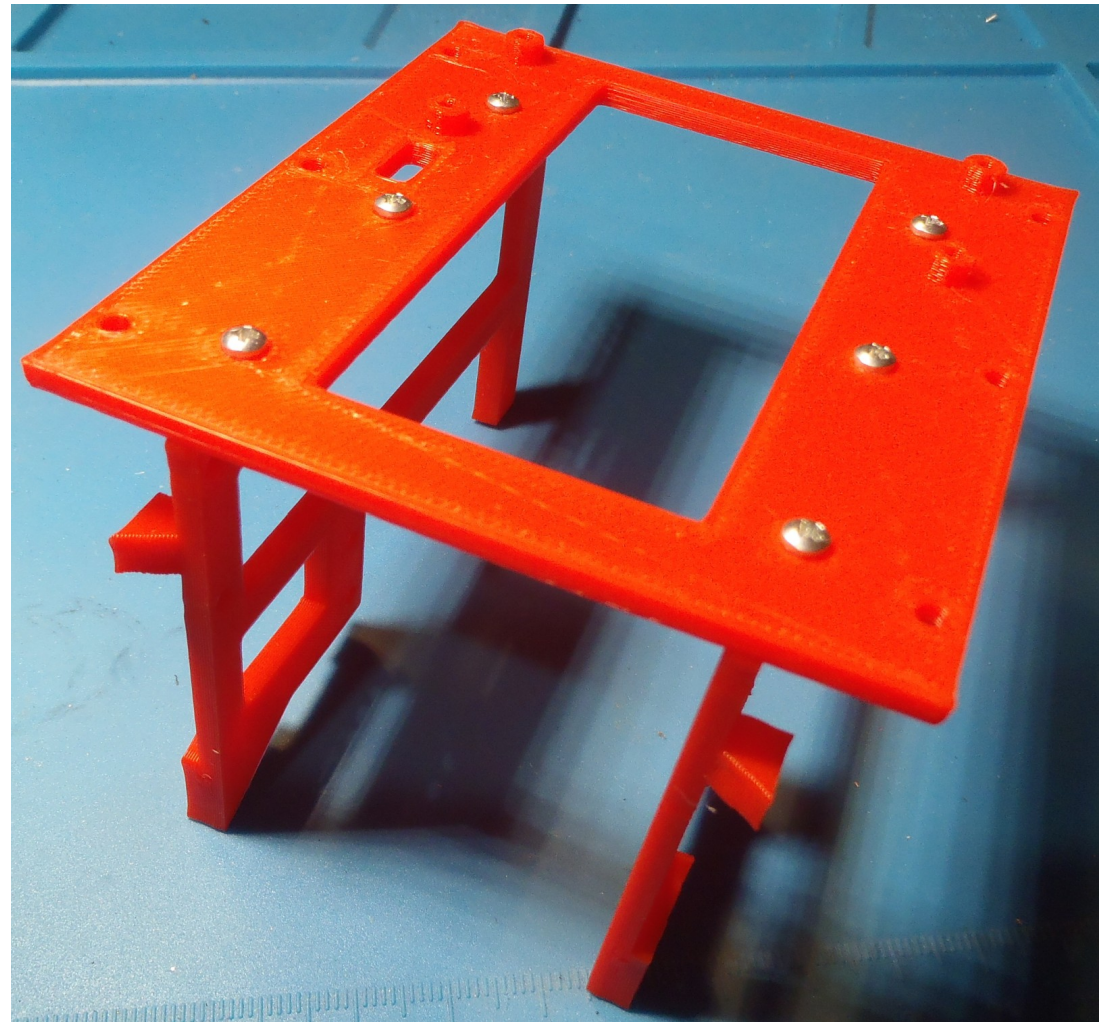
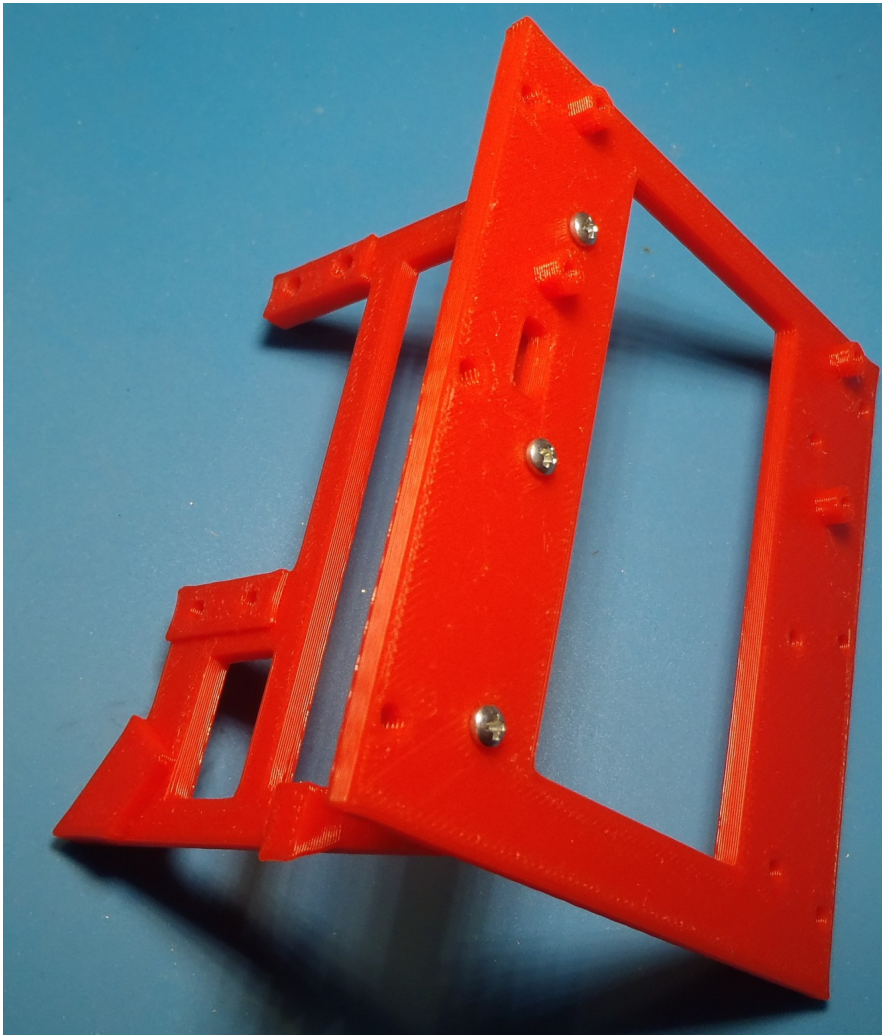
- Screws

- 18 #2x1/4
- 14 #2x3/8
- 8 #4x1/2



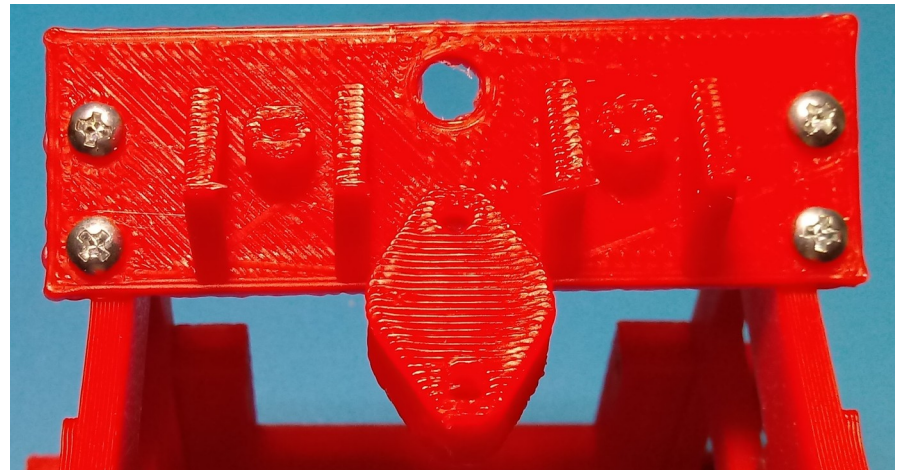
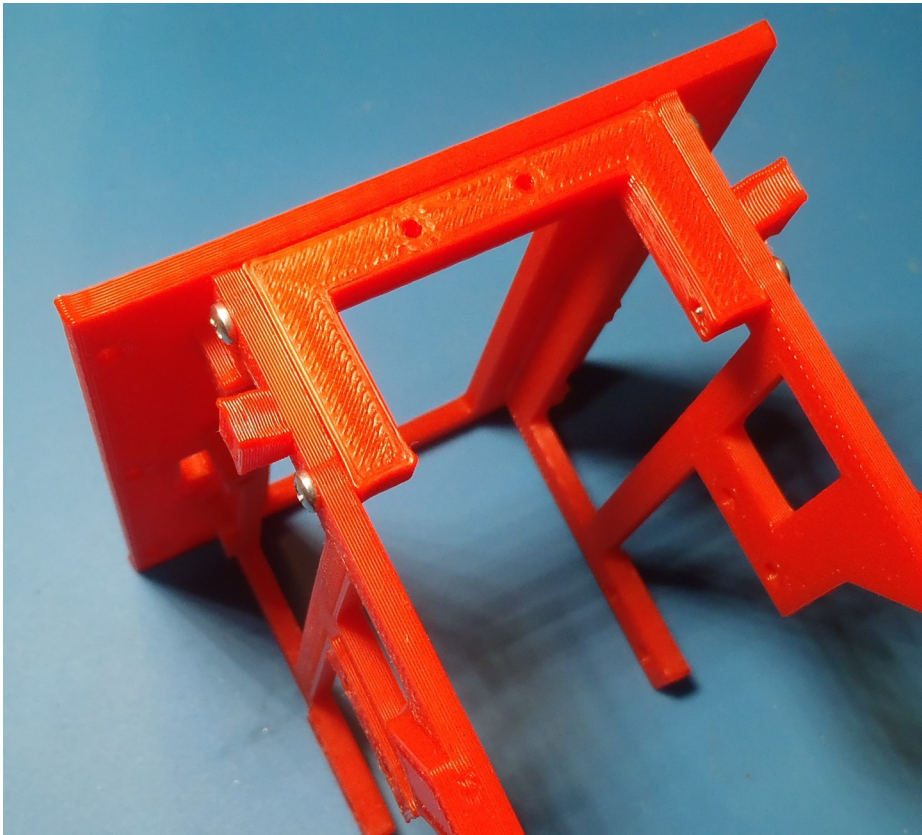
Chassis Assembly

- Attach the right side to the top using 3 #2x3/8 screws as shown below left
- Attach the left side to the top using 3 #2x3/8 screws as shown below right



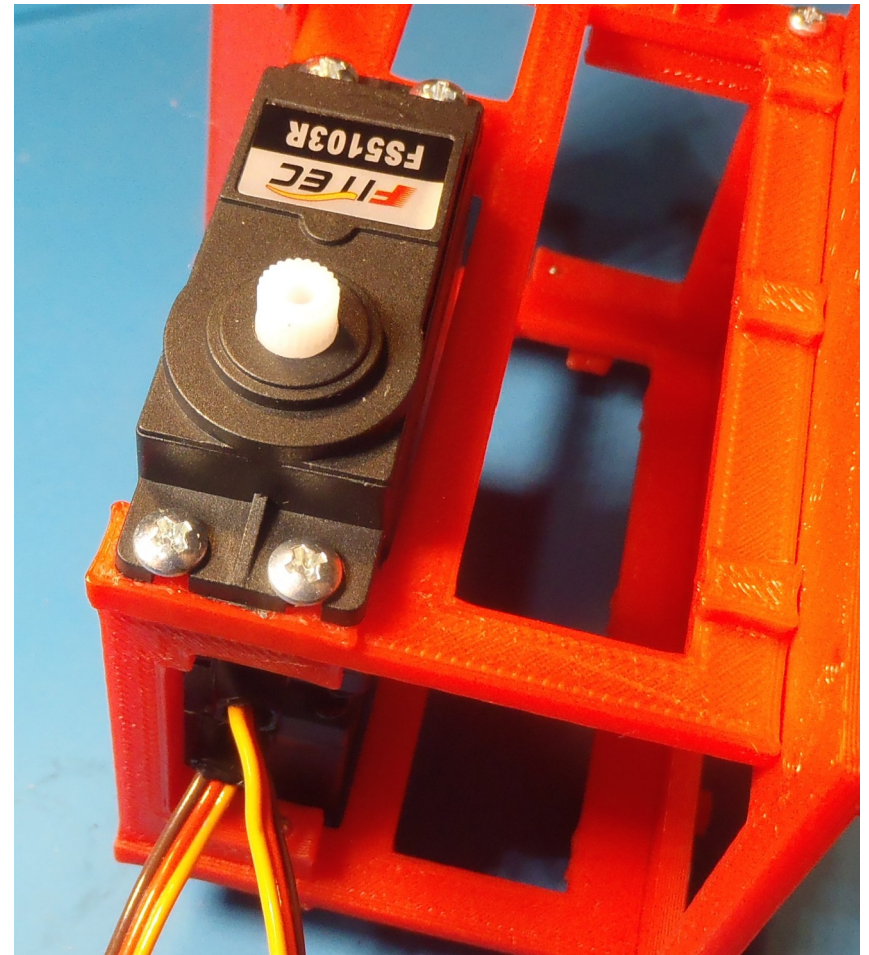
Chassis Assembly

- Attach the front brace between the sides using 4 #2x3/8 screws as shown below left
- Attach the plow/front support to both sides using 4 #2x3/8 screws as shown below right



Chassis Assembly

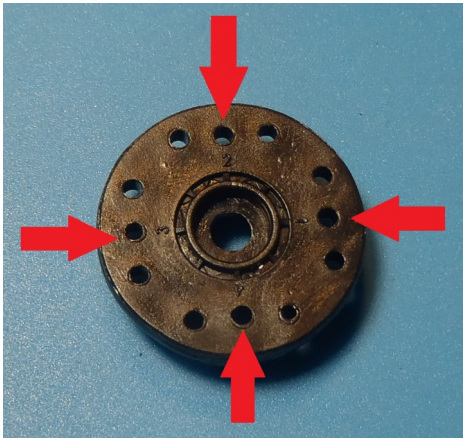
- Attach a servo to the right hand side using 4 #4x1/2 screws as show below left. The rear screws go into the rear brace. Position the brace as show with the cross piece facing the bottom of the bot and the servo cable above it.
- Attach the other servo the the left side using 4 #4x1/2 screws as shown below right.



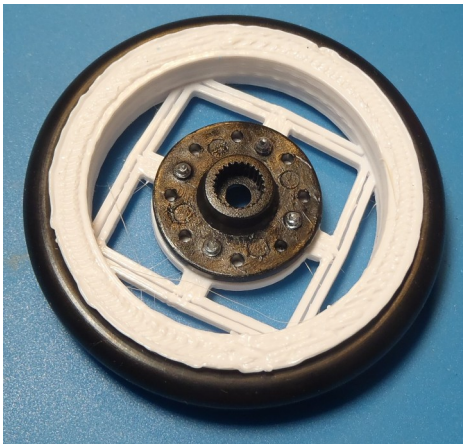
Chassis Assembly



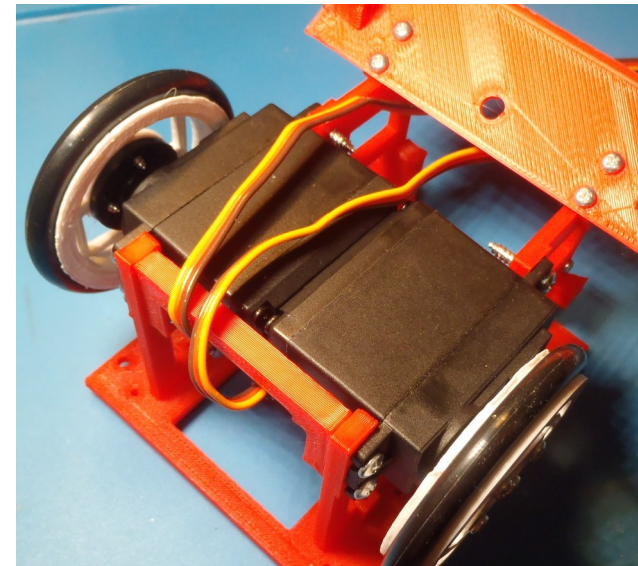
- Place the O-rings on the wheels as shown



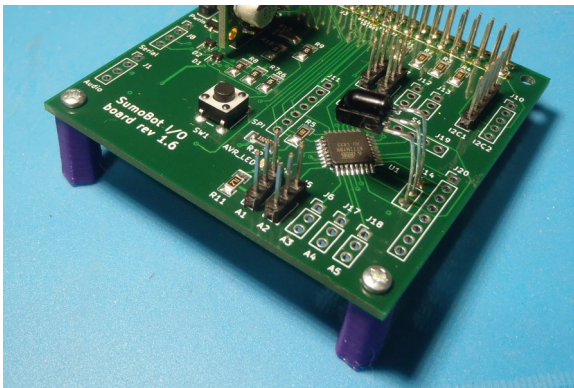
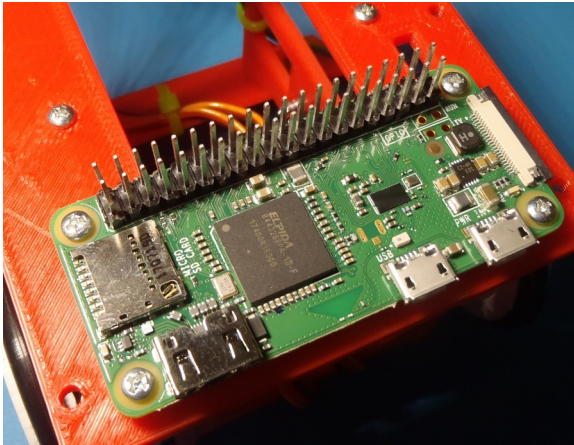
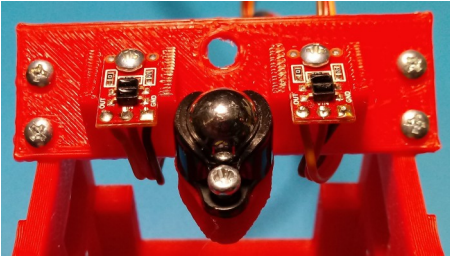
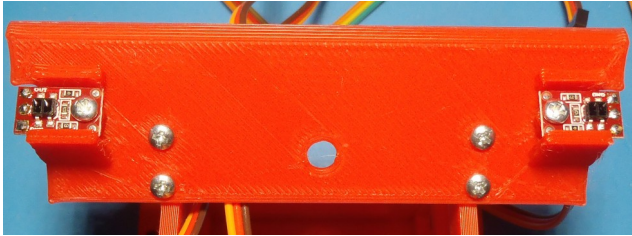
- Mount the round servo horns to the inside of the wheels using 4 #2x1/4 screws on each one. The screws should go thru the wheels and into the four holes shown on the left. (The middle hole in each group of three)



- Mount the horns with the splines facing in as shown on the left.
- Mount the wheels to the servos using the screws supplied with the servos.
- Route the servo cables around the servos and then between the servos and the plow as show on the right.

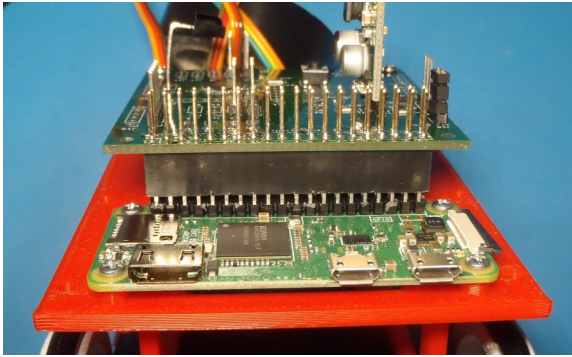


Chassis Assembly

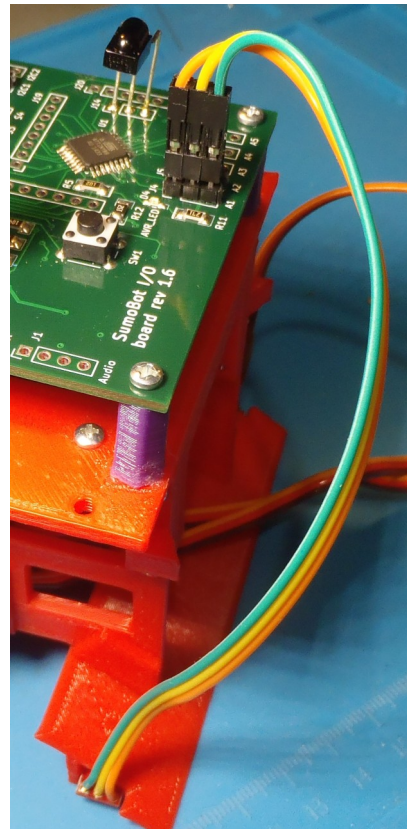
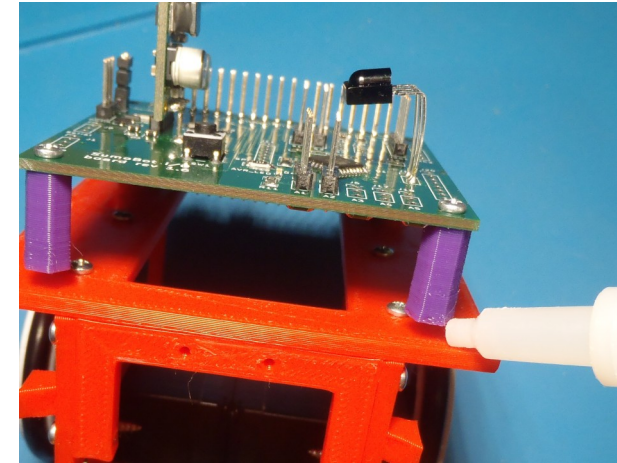


- For the Sumo bot mount the reflectance sensors to the underside of the plow using #2x1/4 screws. The wires go on the outside of the plow.
- For the Line Following bot mount the reflectance sensors to the underside of the plow using #2x1/4 screws. The wires go behind the plow. Mount the ball caster using the supplied nuts and bolts.
- Mount the Raspberry Pi Zero onto the four stand offs on the top of the bot using 4 #2x1/4 screws.
- Mount the two stand offs to the front of the I/O board using #2x1/4 screws.

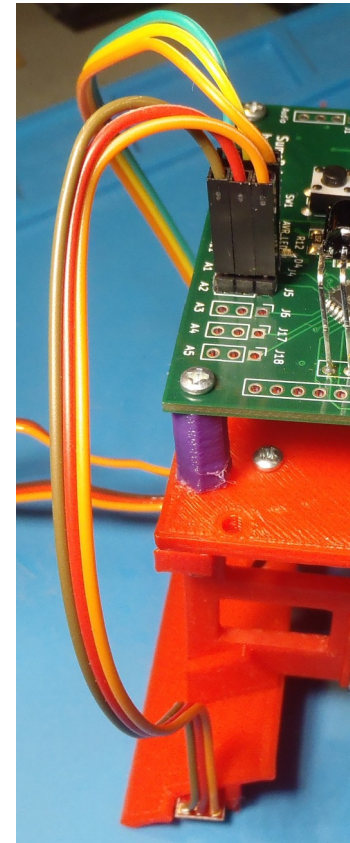
Chassis Assembly



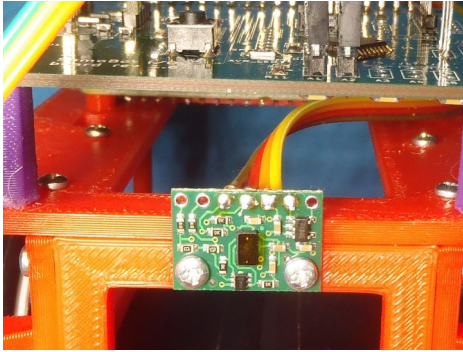
- Plug the I/O Board onto the Raspberry Pi Zero connector. The connector may not go all the way down, do not force it!
- Tip up the I/O board slightly and put a drop of Gel CA glue under each stand off. Press the I/O board back down and hold it for a minute to let the glue harden.



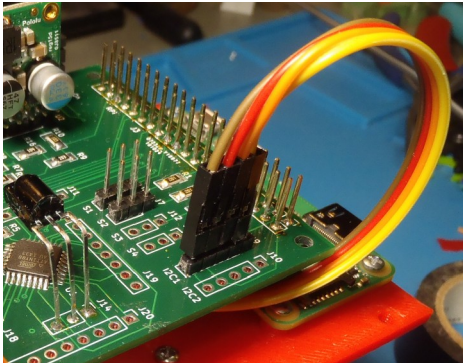
- Connect the cable from the right side sensor to connector J4 on the I/O board. The wires go in the same order as on the sensor. For the sumo bot the wire towards the rear of the sensor goes towards the front of the I/O board as shown on the left.
- Connect the cable from the left side sensor to connector J5 on the I/O board. The wires go in the same order as on the sensor. For the sumo bot the wire towards the front of the sensor goes towards the front of the I/O board as show on the right.
- For the line following bot, on both sensors, the wire on the right hand side of the sensor (as seen from the front) goes to the front of the I/O board.



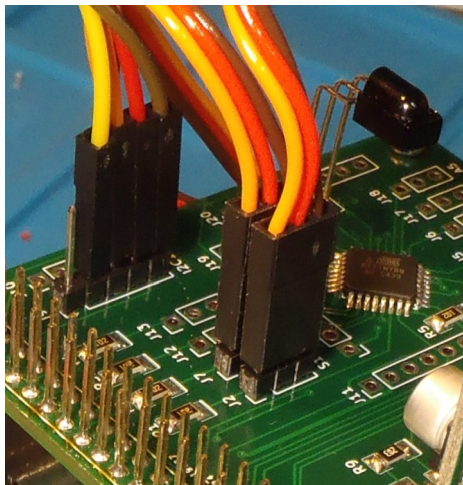
Chassis Assembly



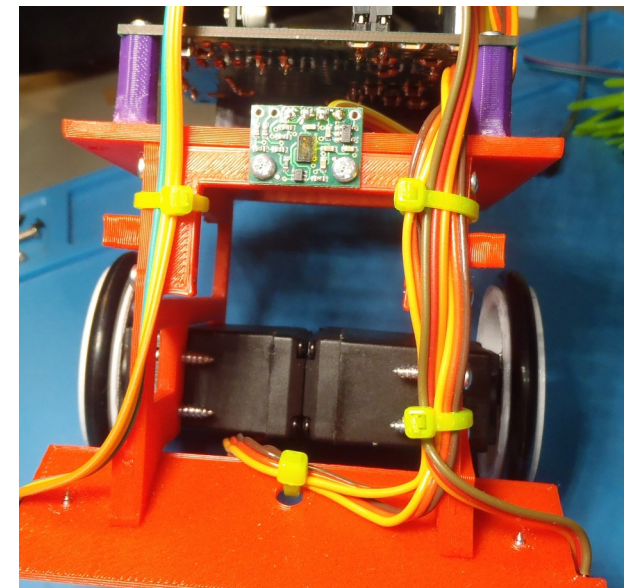
- Mount the TOF sensor to the front of the bot using 2 #2x1/4 screws. Route the cable under the I/O board and out the left side of the bot.



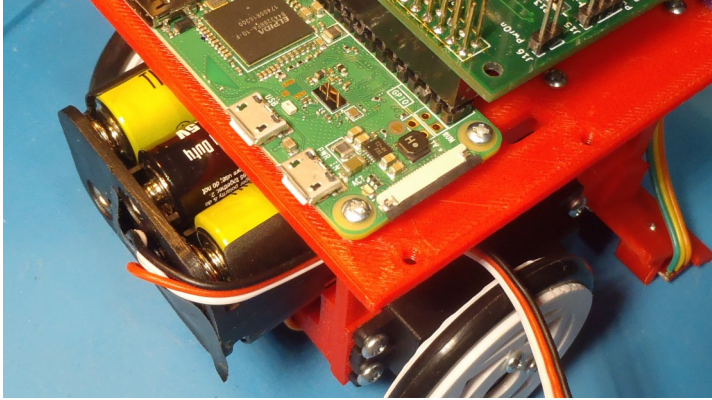
- Connect the cable from the TOF sensor to connector J9 on the I/O board. The wires go in the same order they are in on the TOF sensor. The wire on the left hand side of the sensor goes towards the front of the I/O board. The last pin on J9 is not used.



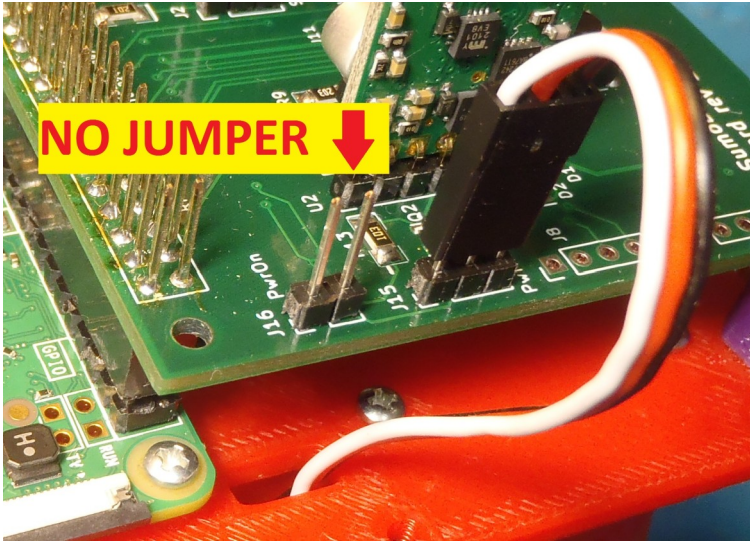
- Connect the cable from the right hand servo to connector J2, and the one from the left hand servo to J7. They go with the brown wires towards the front of the bot.
- Use cable ties to secure the wires to the bot as shown on the right.



Chassis Assembly



- Route the battery cable thru the large opening on the right side of the batt and start inserting the battery into the bot. The end of the battery with the cable goes towards the rear.



- Insert the battery fully into the bot and then route the battery cable up thru the hole in the right side of the top.
- Make sure there is no jumper on header J16
- Connect the cable to connector J15. The polarity does not matter.



- Put a rubber band around the battery to hold it in place, putting the ends over the hooks on the front of the bot.

Sumo/Line Following Robot Assembly

Congratulations! The Bot is fully assembled!

