GPSTAR TECHNOLOGIES

NEUTRONA WAND KIT

(For the Mack's Factory Neutrona Wand)

Installation Manual

Congratulations on your purchase of the GPStar Neutrona Wand Kit for your Mack's Factory Neutrona Wand.

For more information please visit:

Website:
https://gpstartechnologies.com
Github:
https://github.com/gpstar81/haslab-proton-pack
Facebook:
https://www.facebook.com/groups/gpstartechnologies

Warning! Must read before proceeding

- There are minor modifications to the Neutrona Wand.
- **Proceed at your own risk!**

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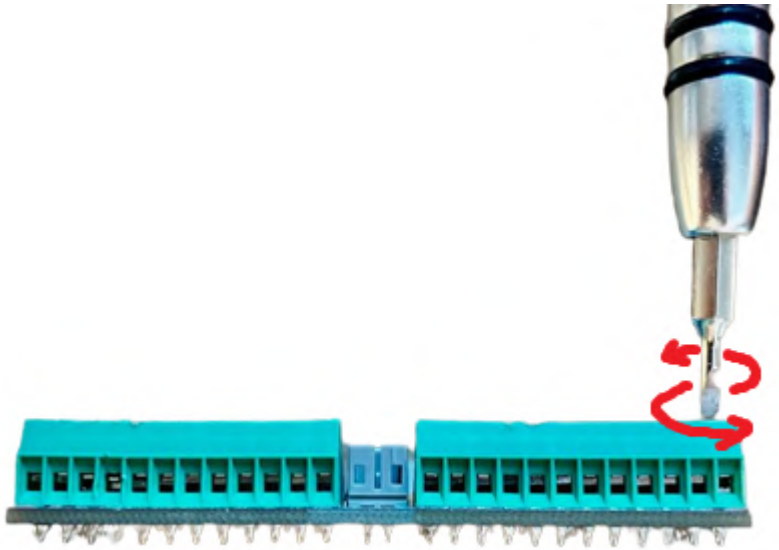
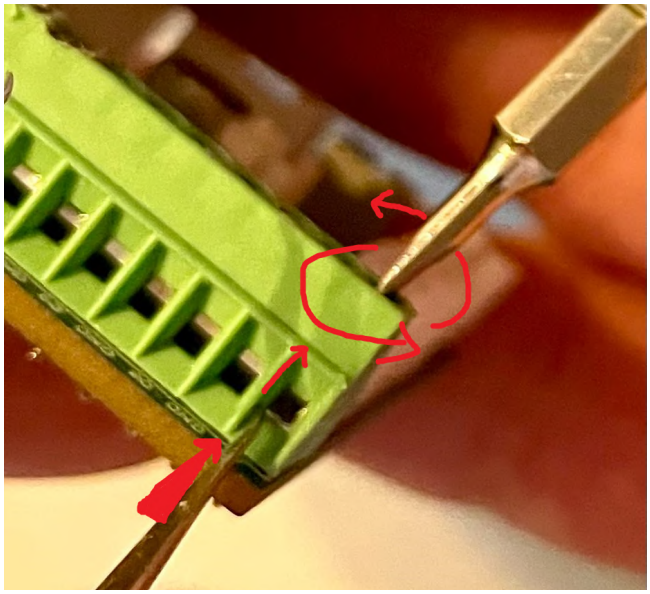
Pre-Installation Notes

Important Tips about the terminal blocks before starting.
The Terminal blocks on the GPStar Neutrona Wand board may come with the “elevator doors” closed. Be sure to open them by turning all the screws to the right. As you can see in the image, terminal block #1 on the right is opened while the rest are closed.

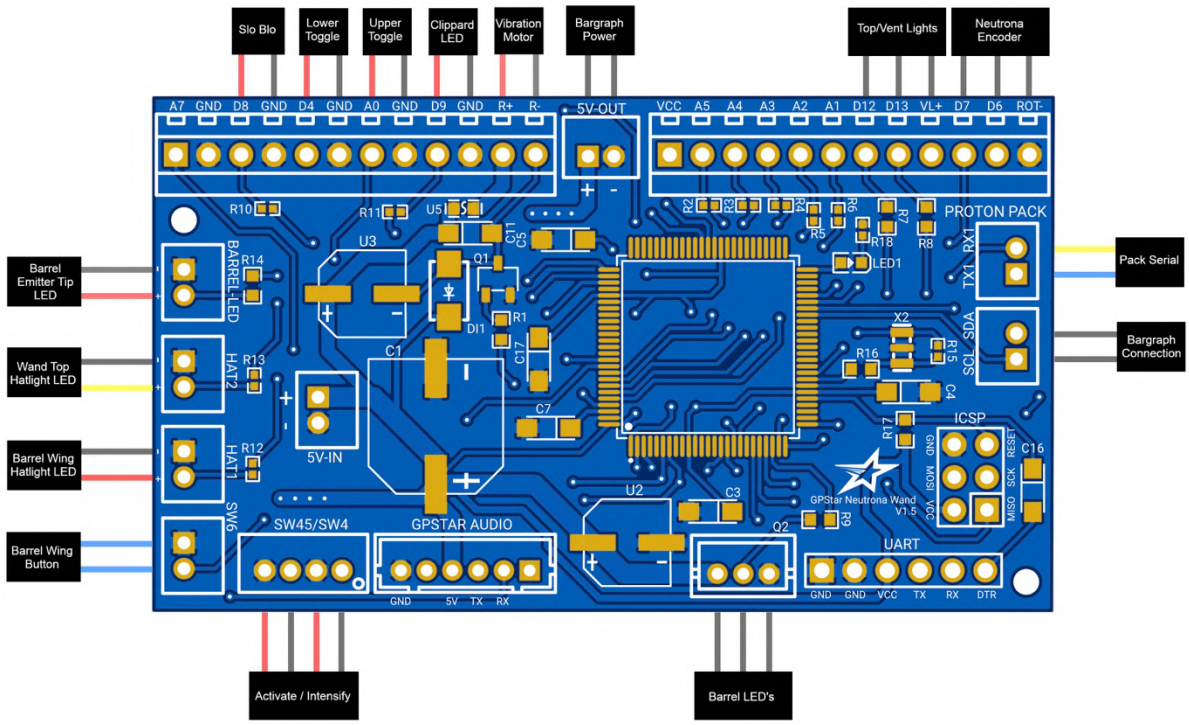


If you run into a situation where no matter how much you turn the screw to close the terminal block it just won’t close. Take some tweezers and apply pressure to the edge of the exposed door while pushing upwards towards the screw. At the same time use your other hand to turn the screw. This will reconnect the door and the screw.



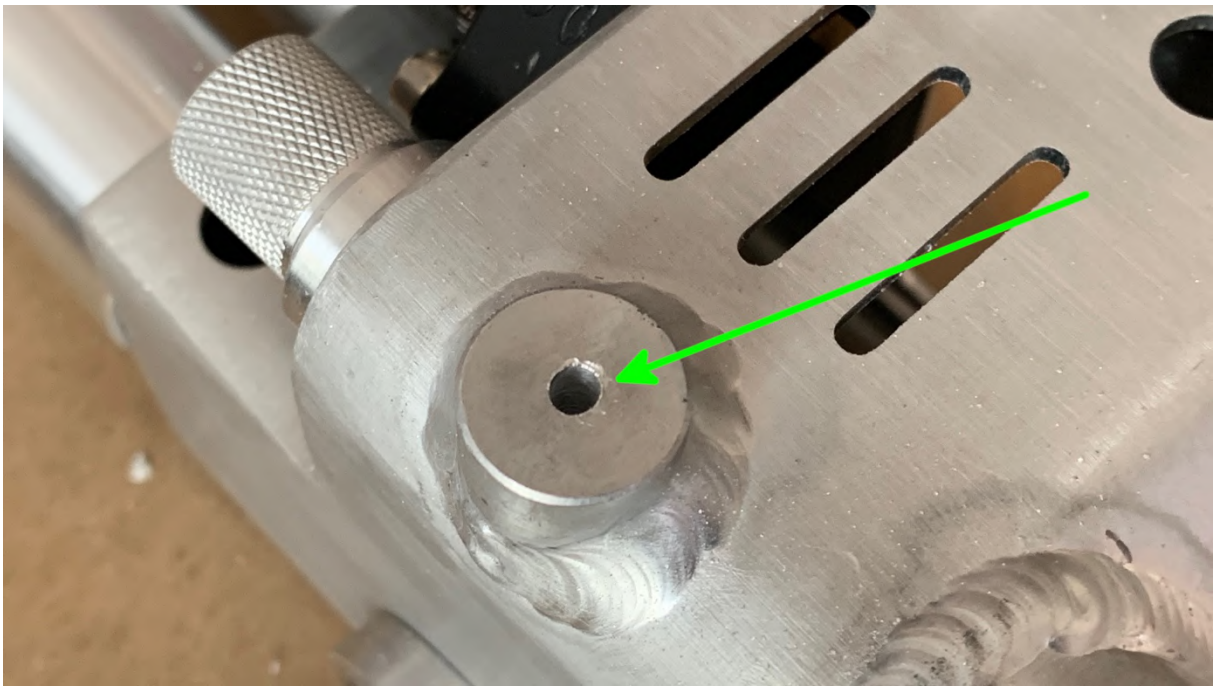
A general wiring diagram can be found at:
https://github.com/gpstar81/haslab-proton-pack/blob/main/WAND_PCB.md

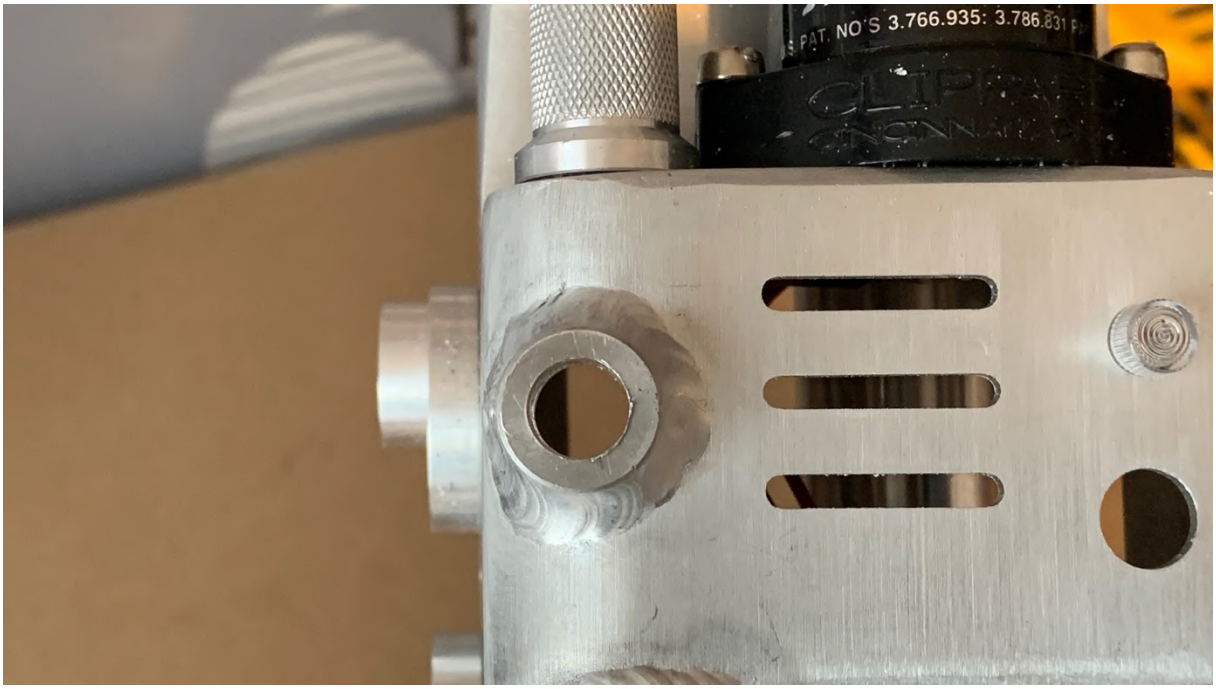
General connections diagram for the Mack's Factory Neutrona Wand:



Installation

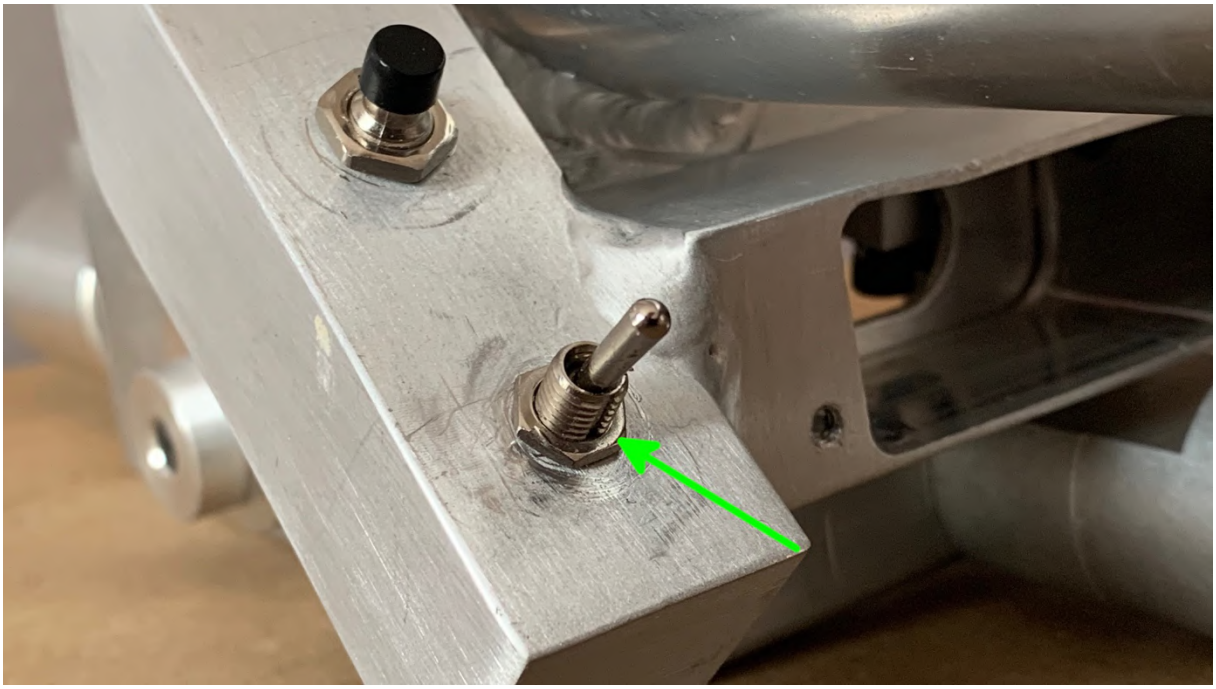
If not already, you will need to drill out the hole on the top of the Neutrona Wand where the top knob normally sits. Using a 9mm drill bit, drill directly down in the centre where the existing screw threads exist.



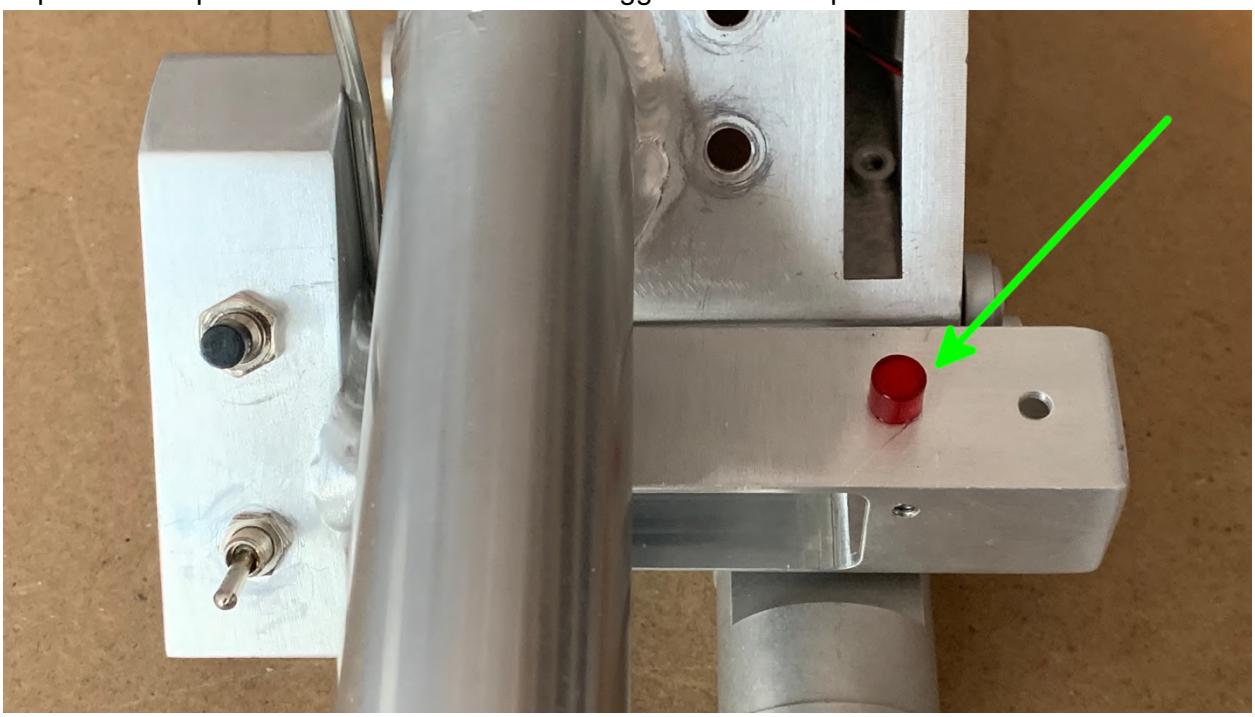


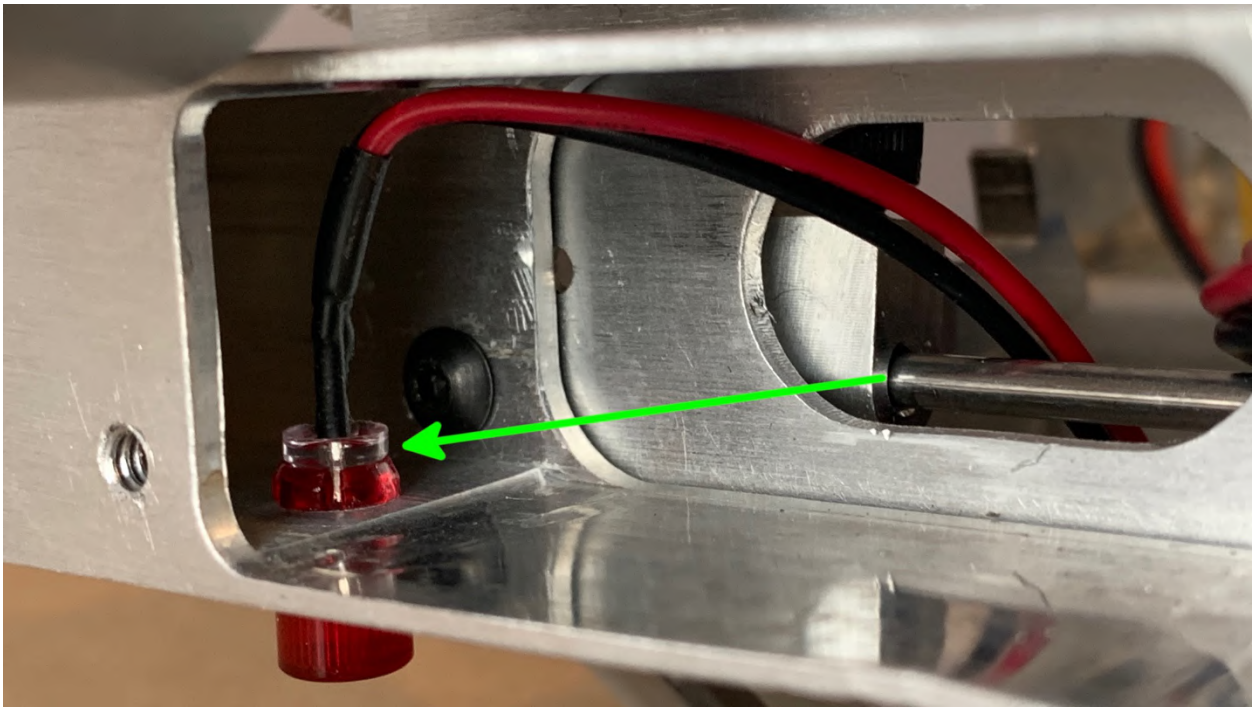
Install the Activate and Intensify switches into the Neutrona Wand Trigger Box.

For the toggle switch, the side with the notch should be facing down to have the correct toggle switch orientation.

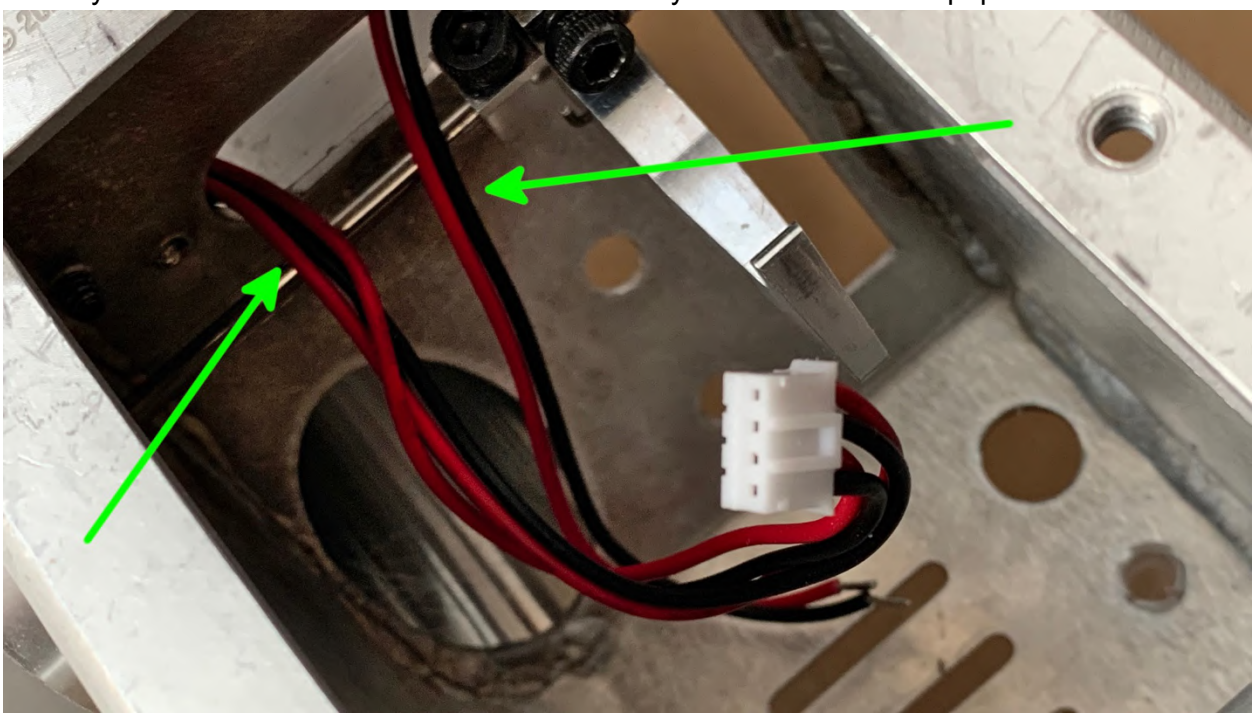


Clip the red ClipLite into the Neutrona Wand Trigger Box and clip the Slo-Blo led into it.





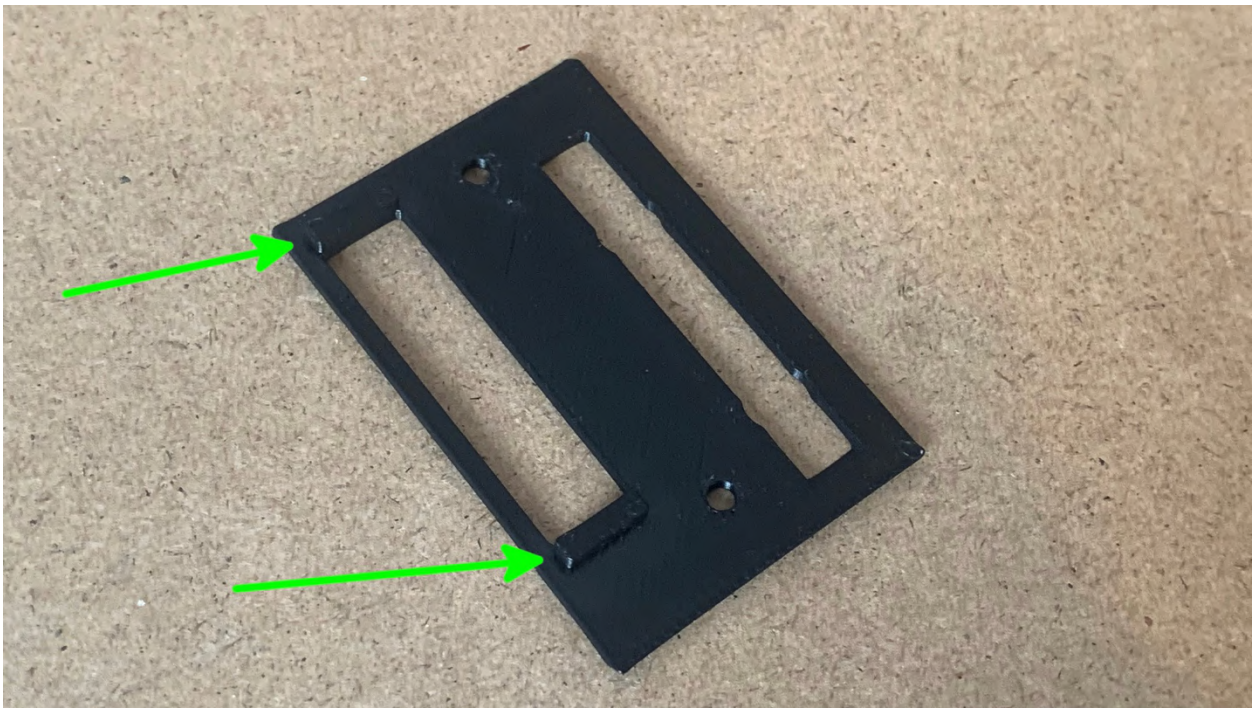
Route your wires into the Neutrona Wand main body and over the barrel pop mechanism rod.



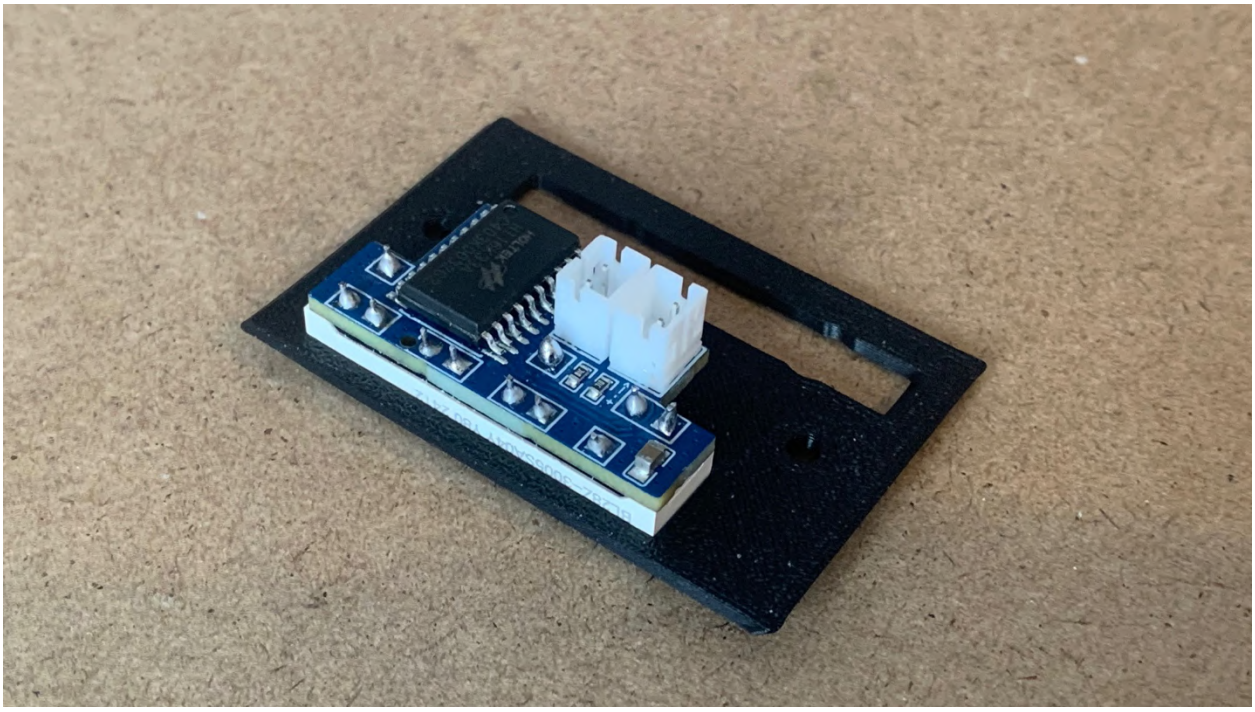
There are 2 different bargraph mount options.

Classic Bargraph Mount: This is the standard version which is more similar to the 1984 / 1989 bargraph look.

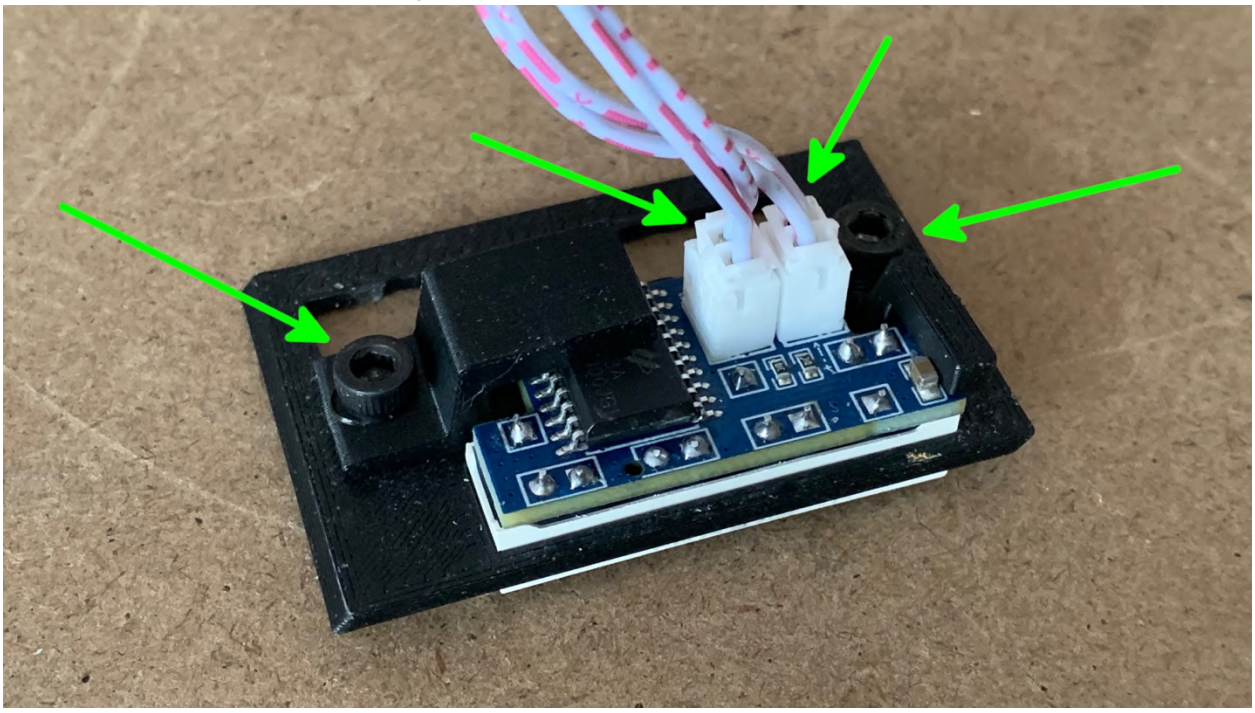
Afterlife / Frozen Empire Bargraph Mount: This version replicates the look in Afterlife and Frozen Empire. This version will have 2 tabs integrated into the mount. One on top and one on the bottom and comes in the kits.



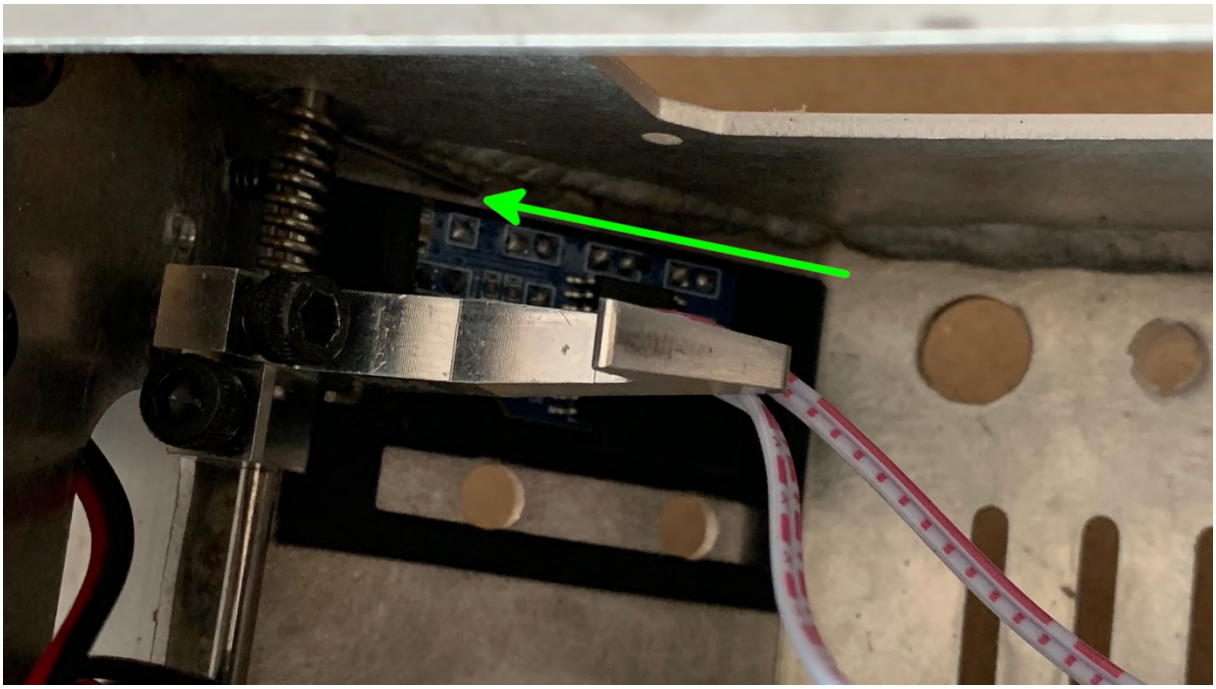
Install the GPStar Bargraph into the preferred bargraph mount.



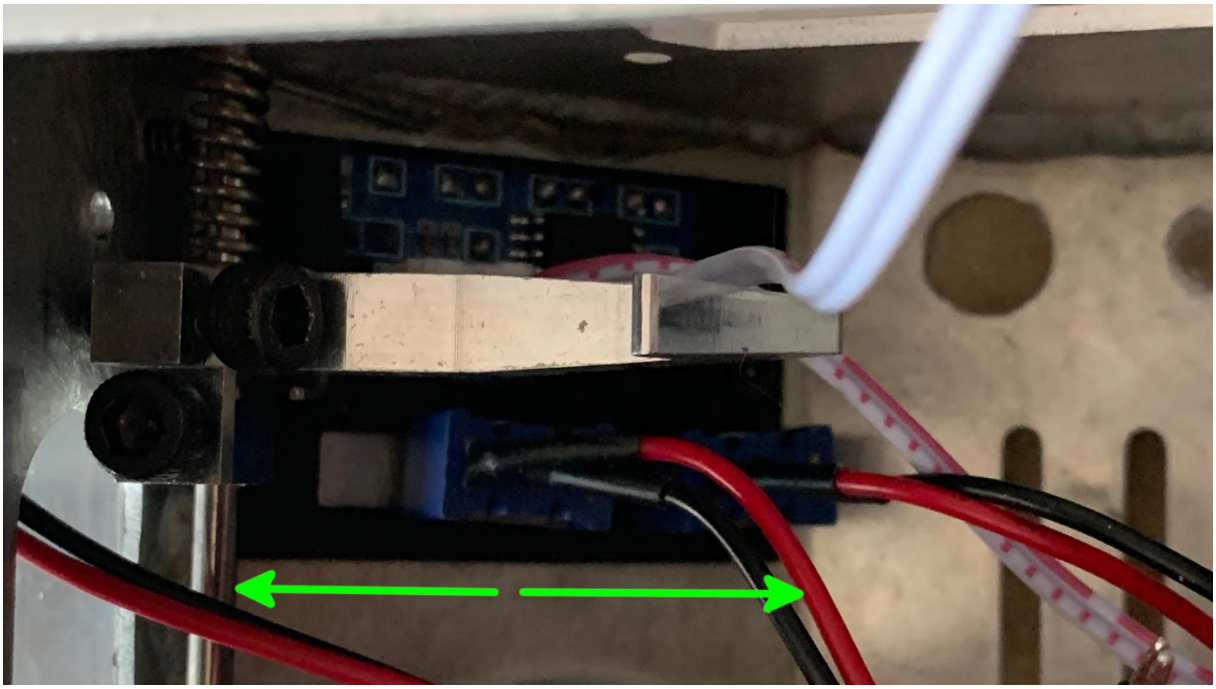
Attach the two bargraph brackets using the two included m3x4 screws. The brackets should be snug against the main bargraph mount and the back of the bargraph as seen in the photo. Then attach the two cables to the bargraph.



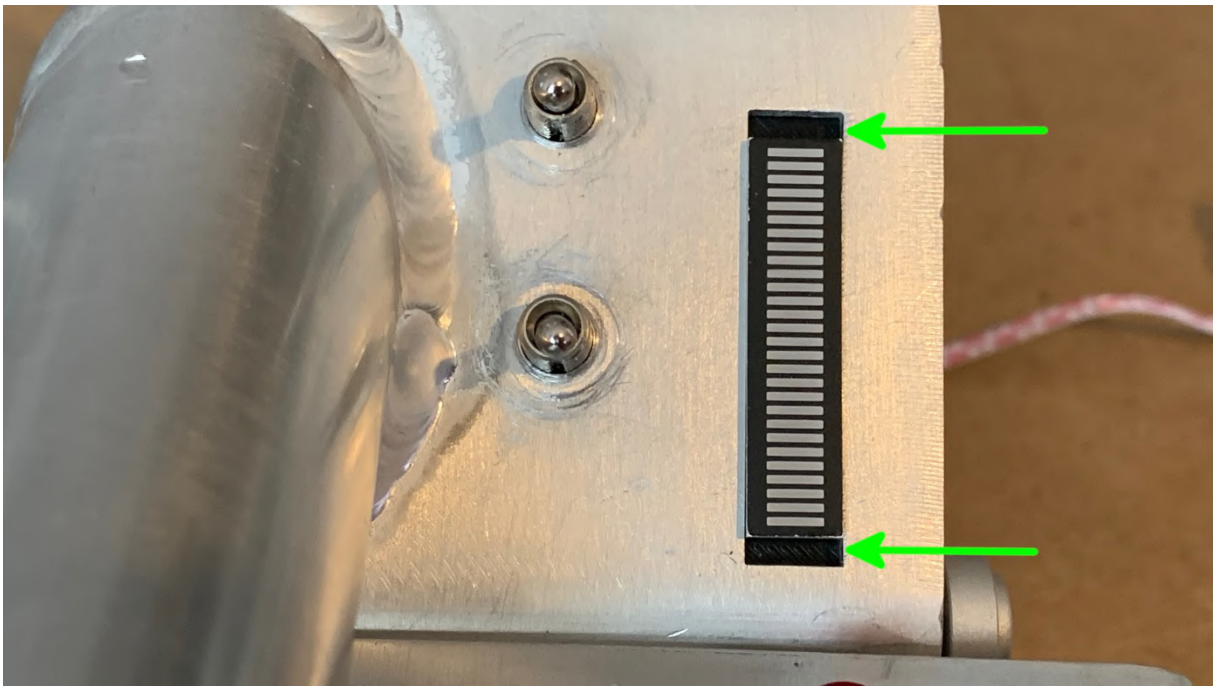
Install the bargraph into the Neutrona Wand. Make sure the barrel mechanism lever spring is off to the side of the Neutrona Wand body and not touching the bargraph as indicated.



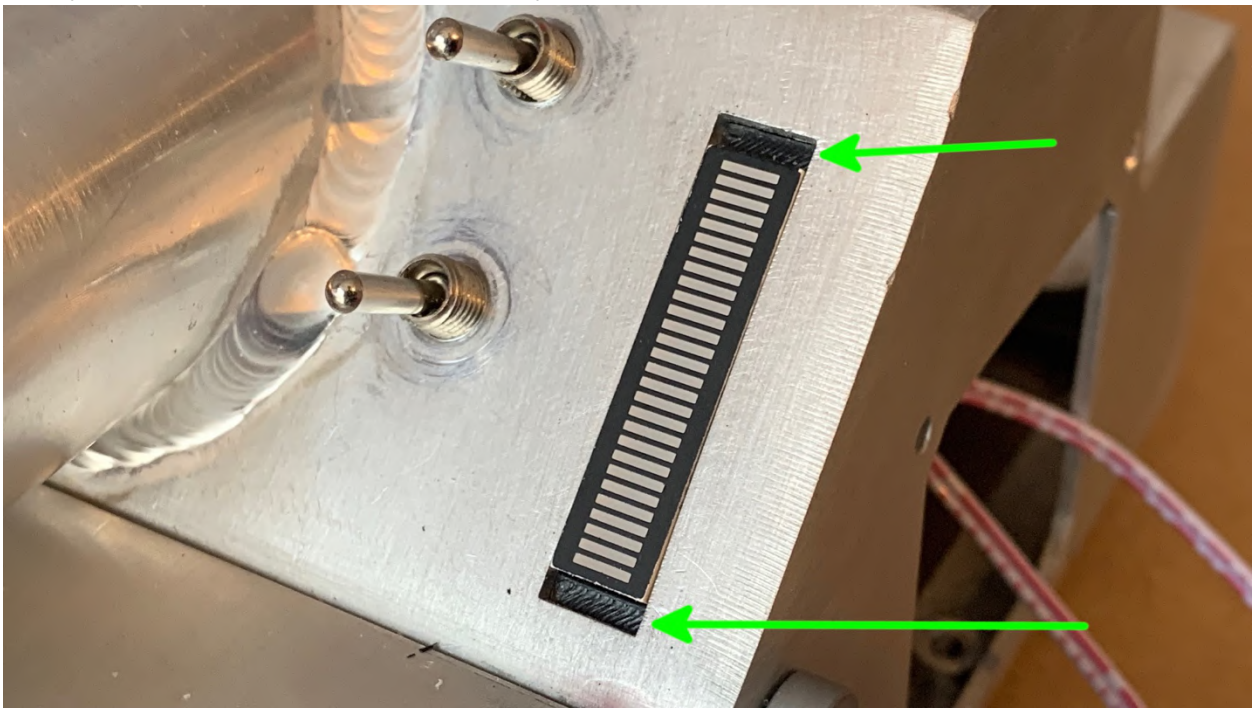
Install the two toggle switches into the bargraph mount but do not tighten them yet. With both switches inserted, slide the bargraph mount up or down to centre the bargraph into the middle of the bargraph cutout on the Neutrona Wand body.



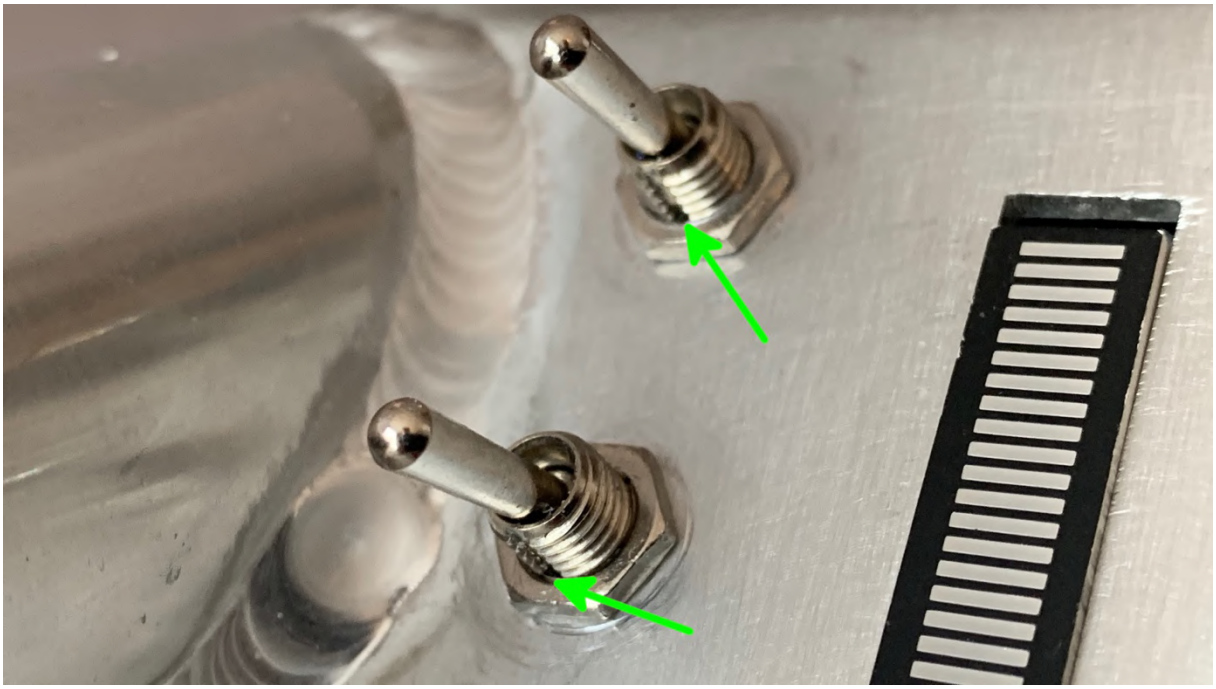
Classic Bargraph Mount: You should have approximately two equal gaps on the top and bottom of the bargraph when using the classic bargraph mount. The bargraph will be slightly extruded out from the cutout on the Neutrona Wand.



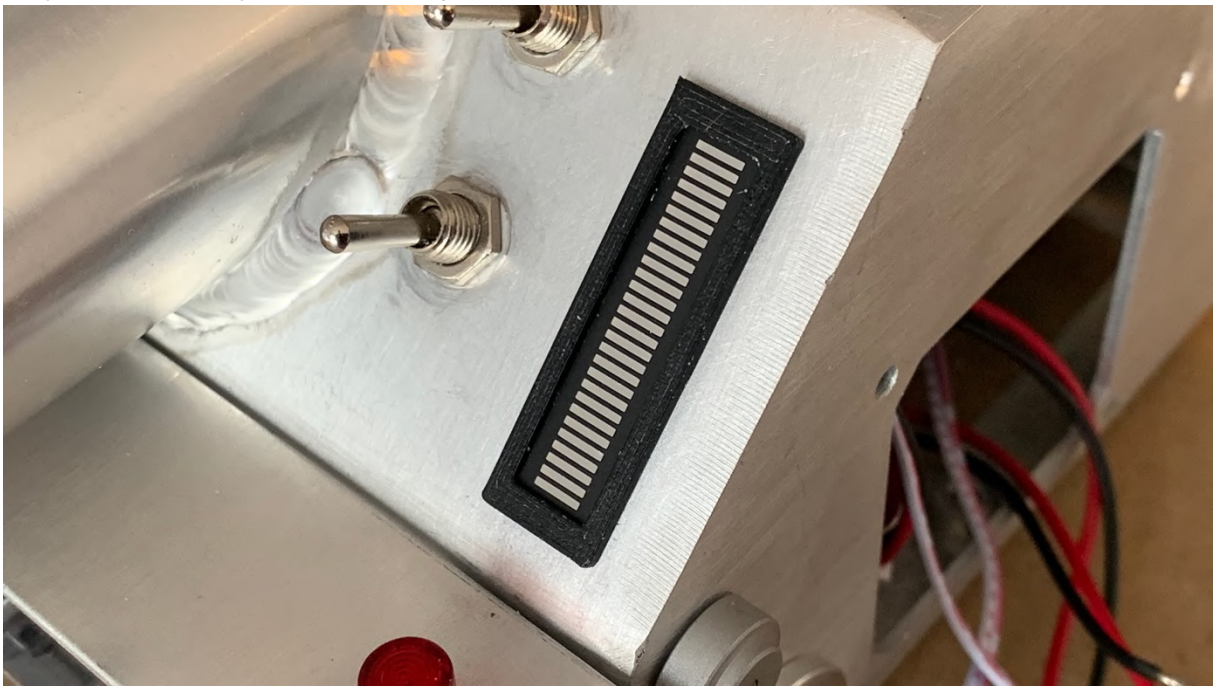
Afterlife / Frozen Empire Bargraph Mount: This version is more similar to the look in Afterlife and Frozen Empire. This version will have 2 tabs, one on top and bottom and it should sit in nearly flush with the Neutrona Wand body.

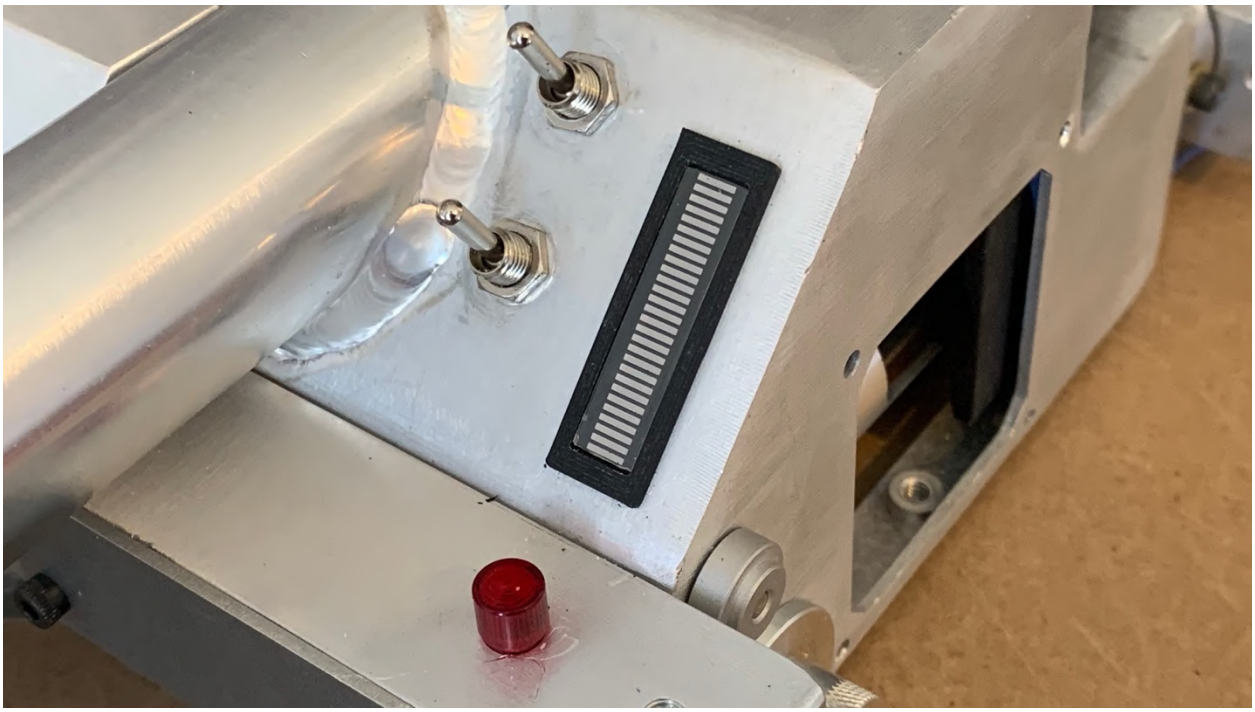


Install the nuts on the toggle switches which will secure the bargraph mount. Note the notches on the toggle switches are facing down for the correct orientation.

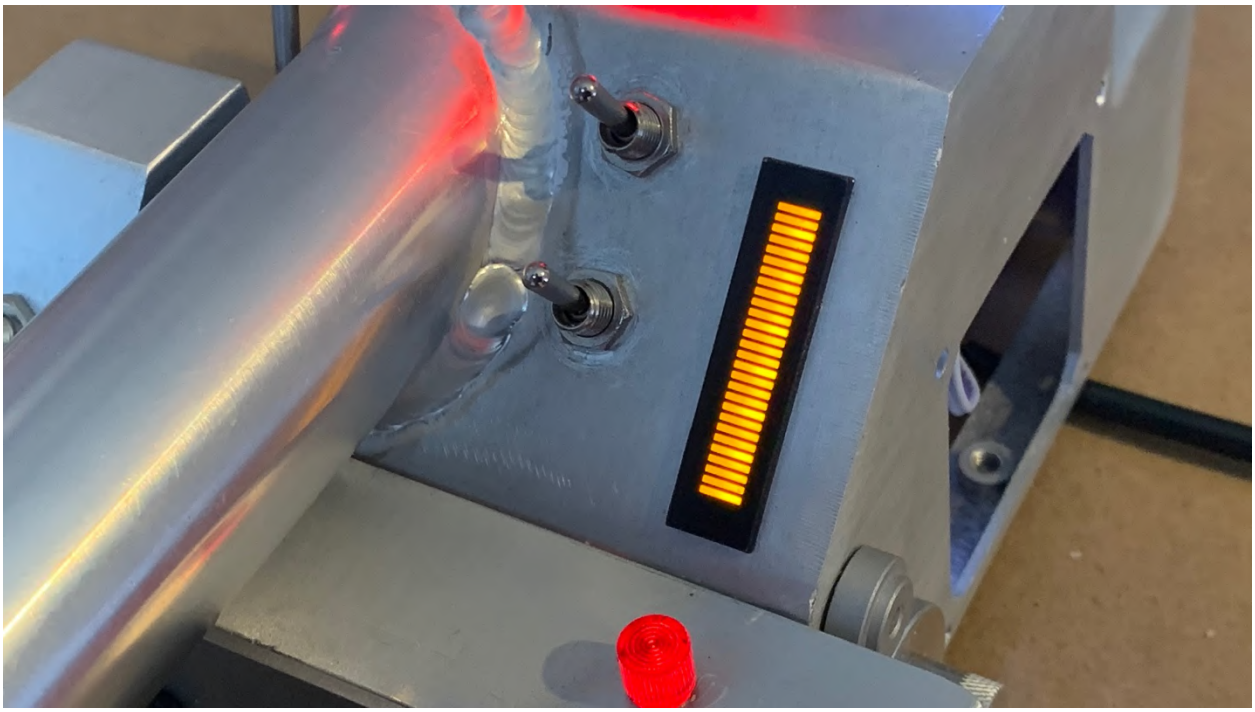


Classic Bargraph Mount: The bargraph bezel will now clip in on the face of the bargraph. You may also optionally clip in the bargraph clear cover into the bezel.

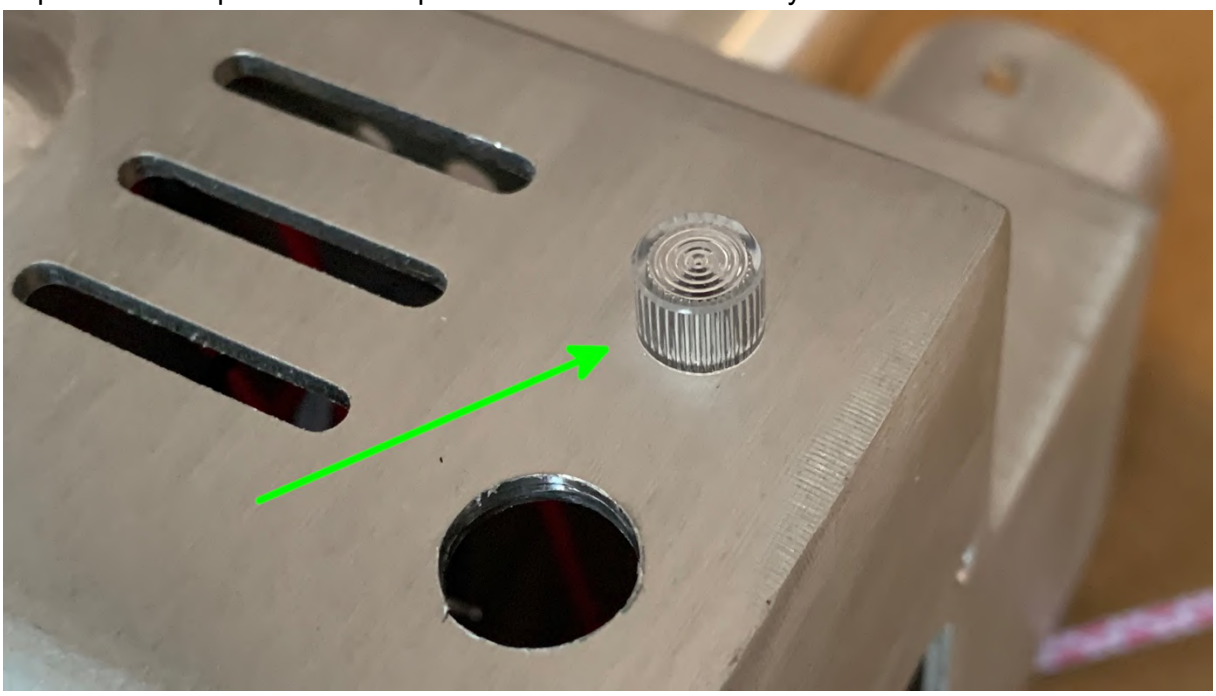




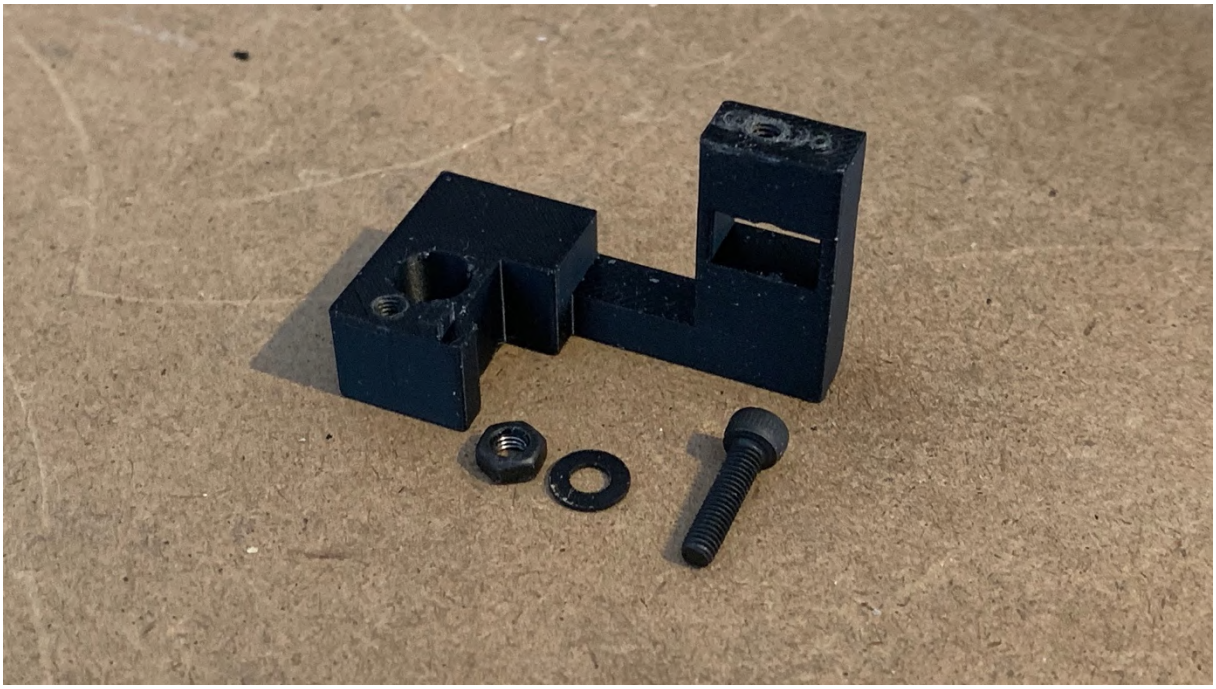
Afterlife / Frozen Empire Bargraph Mount: You may now peel off the backing of the bargraph cover and apply it over the bargraph.

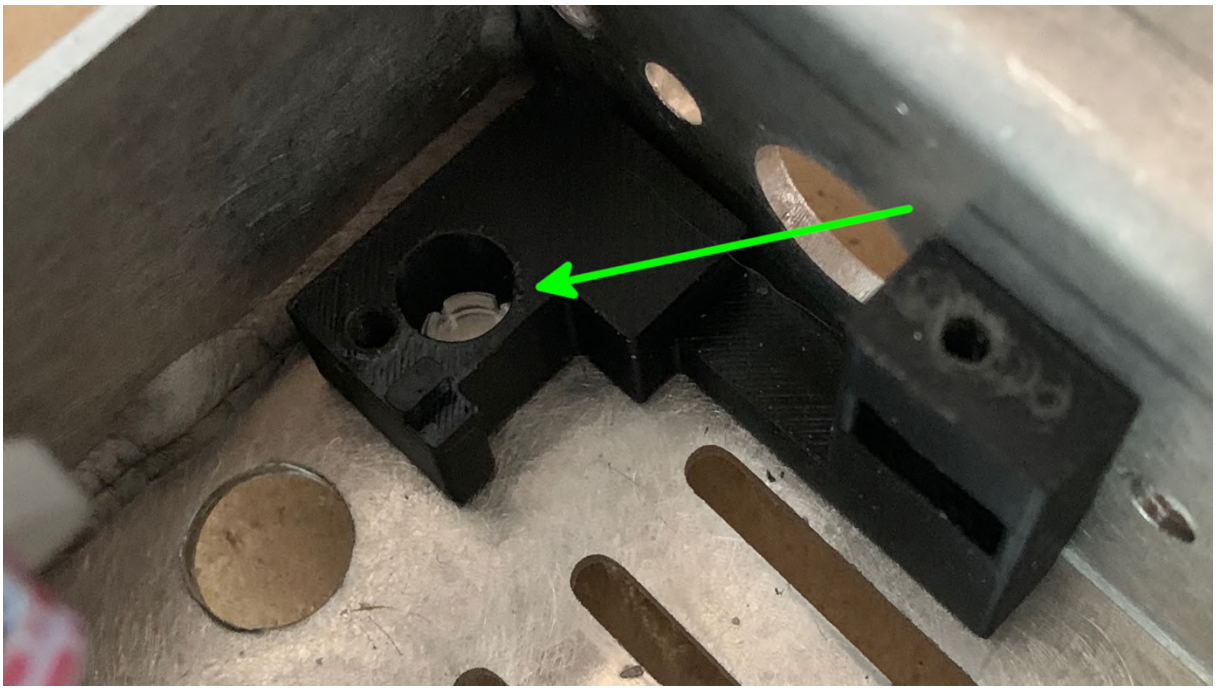


Clip the clear ClipLite into the top of the Neutrona Wand body.

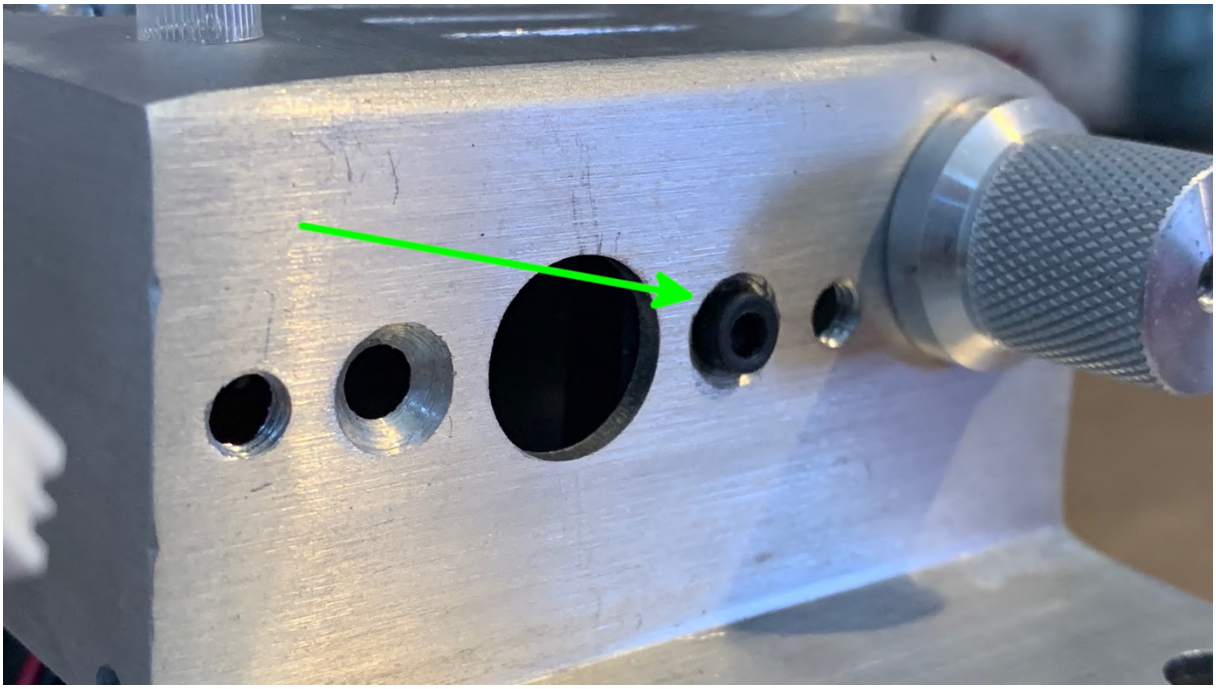


Take the vent light mount and clip it onto the clear ClipLite from inside the Neutrona Wand body.

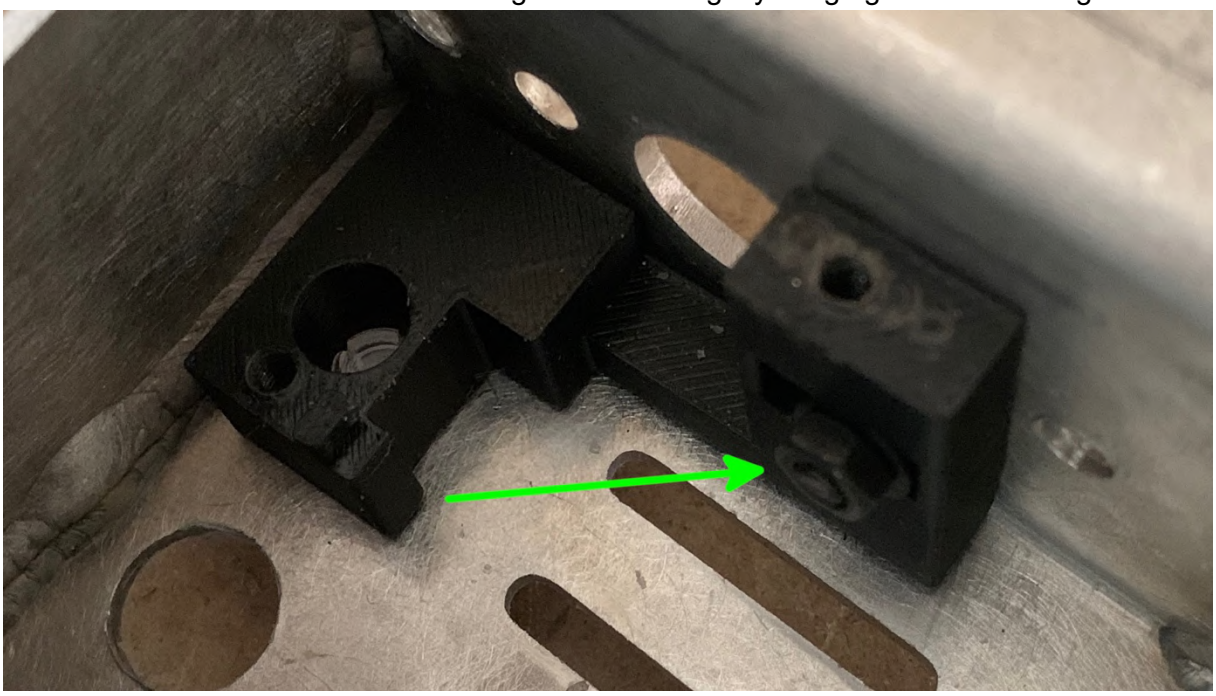




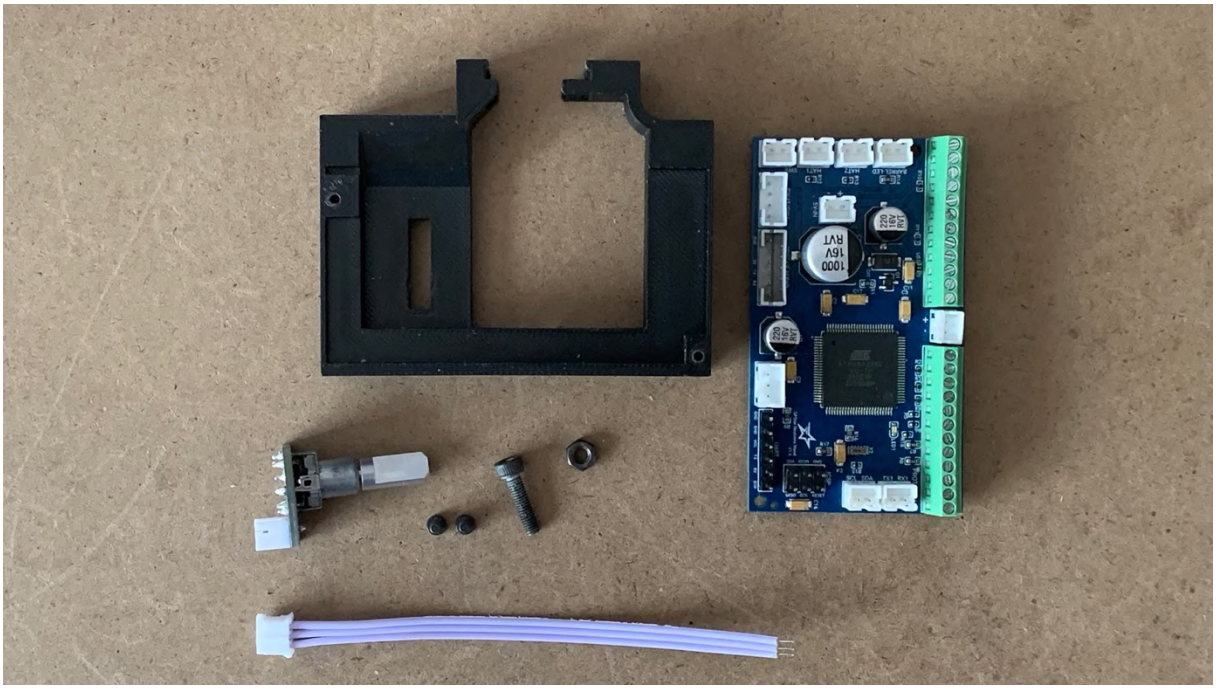
Insert the included m3x12 screw into the indicated recessed hole on the front of the Neutrona Wand body.

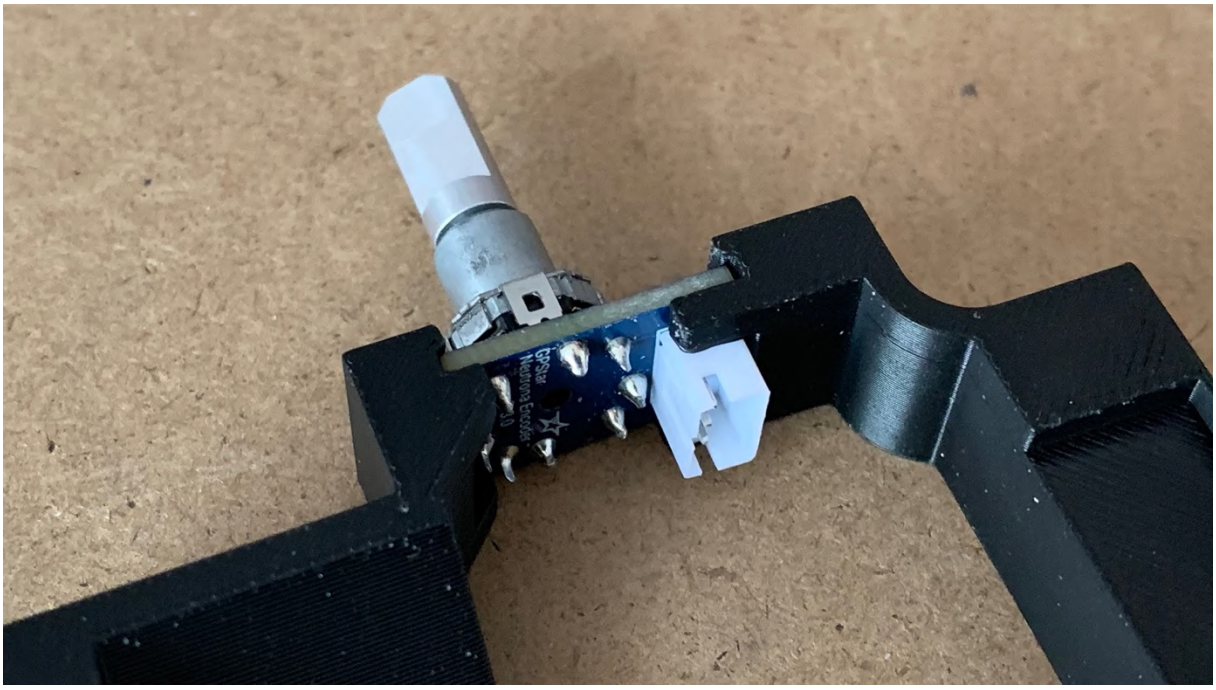


Use the included washer and nut and tighten it down lightly snug against the vent light mount.

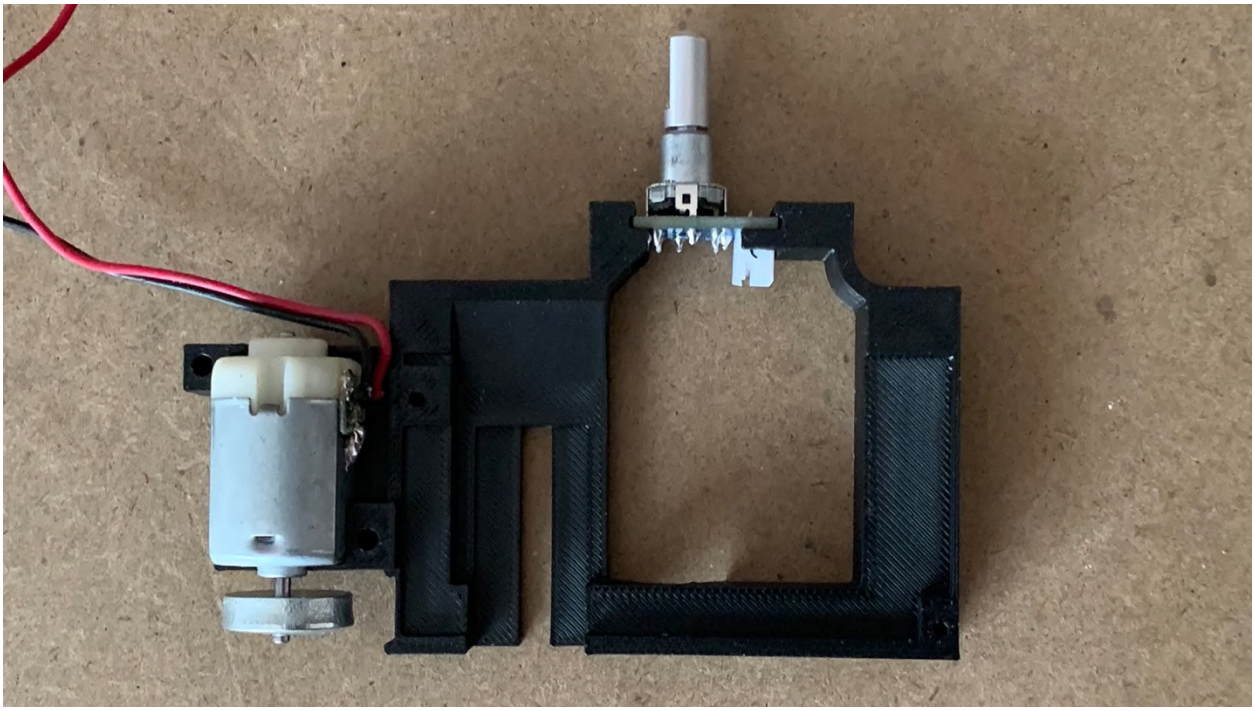


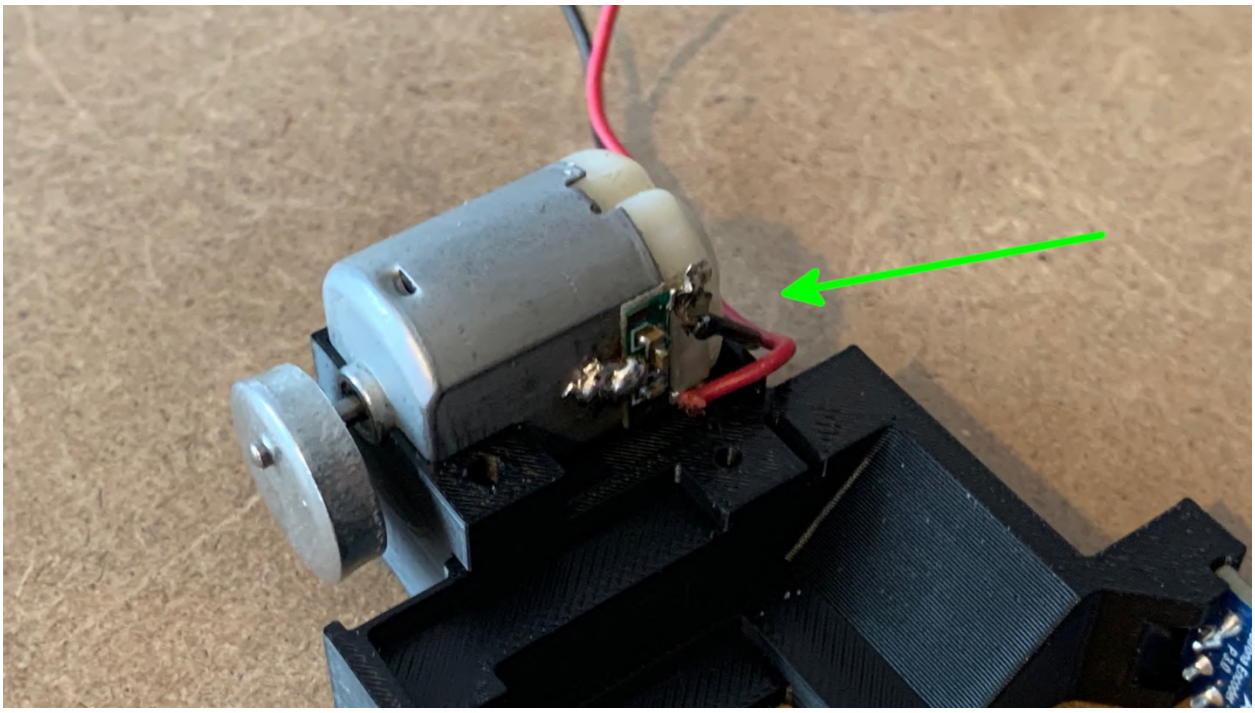
Insert the GPStar Neutrona Wand Encoder into the main mounting bracket.



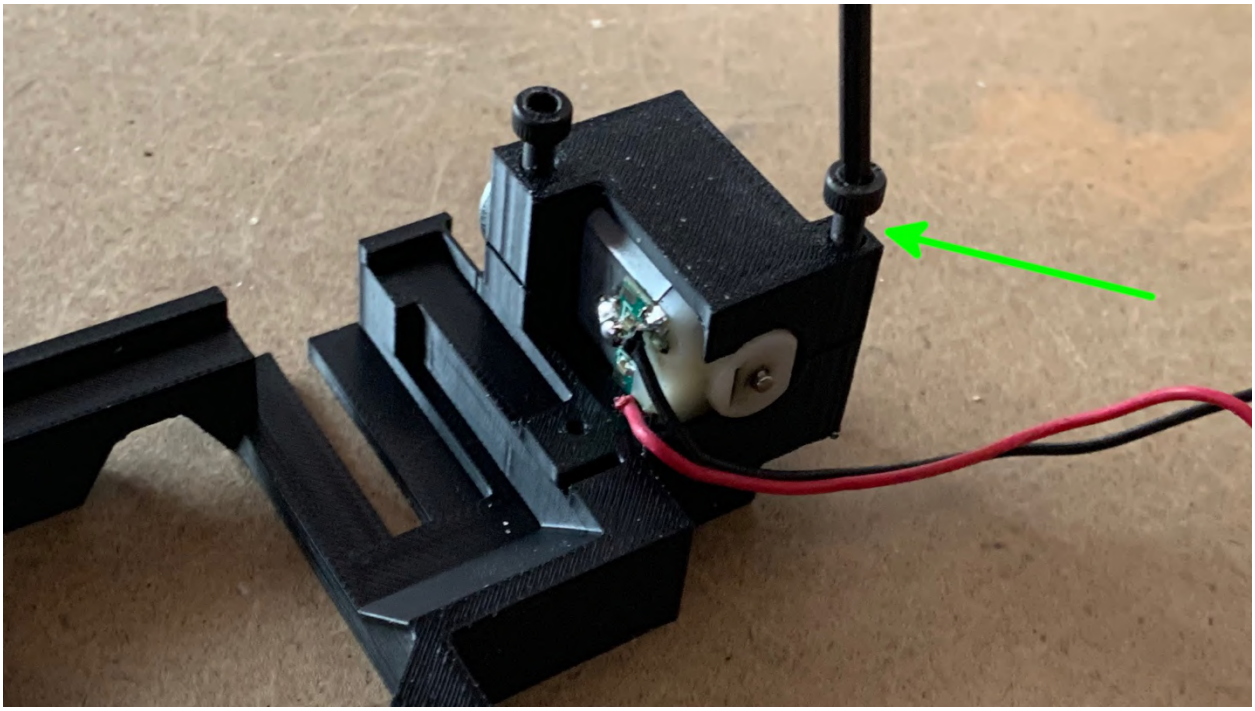


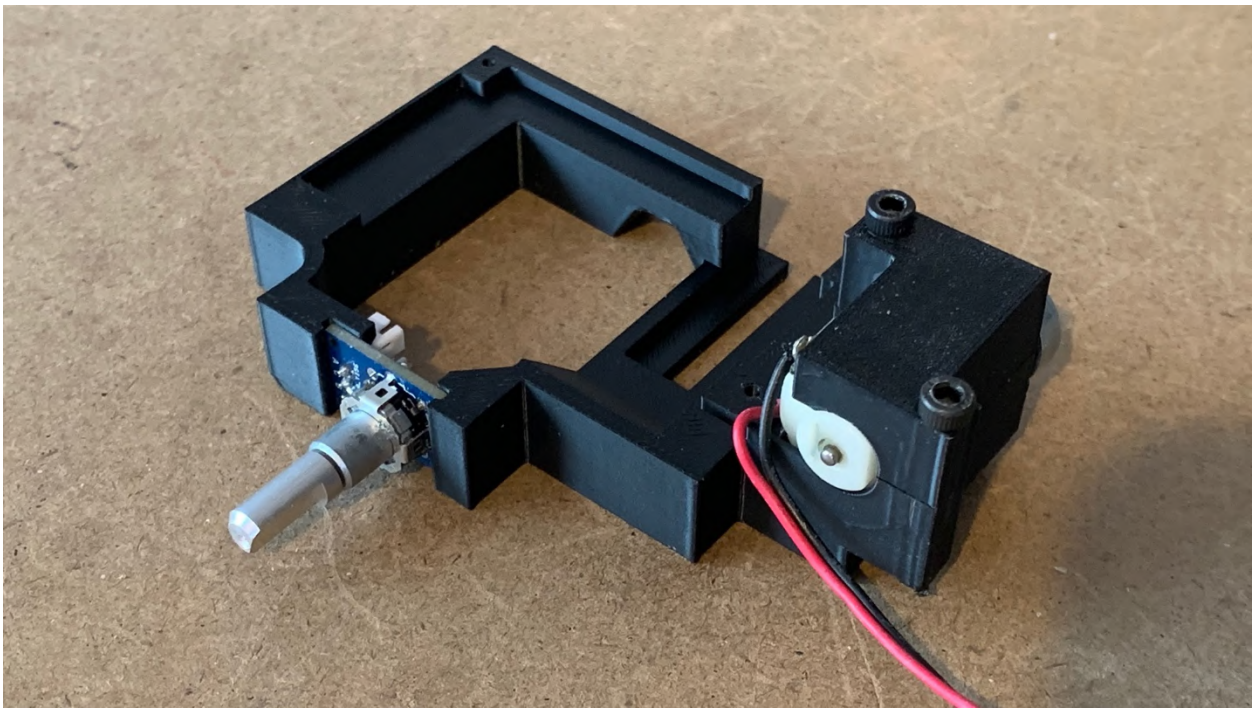
If you have the vibration kit variant, install the vibration motor into the main mounting bracket.



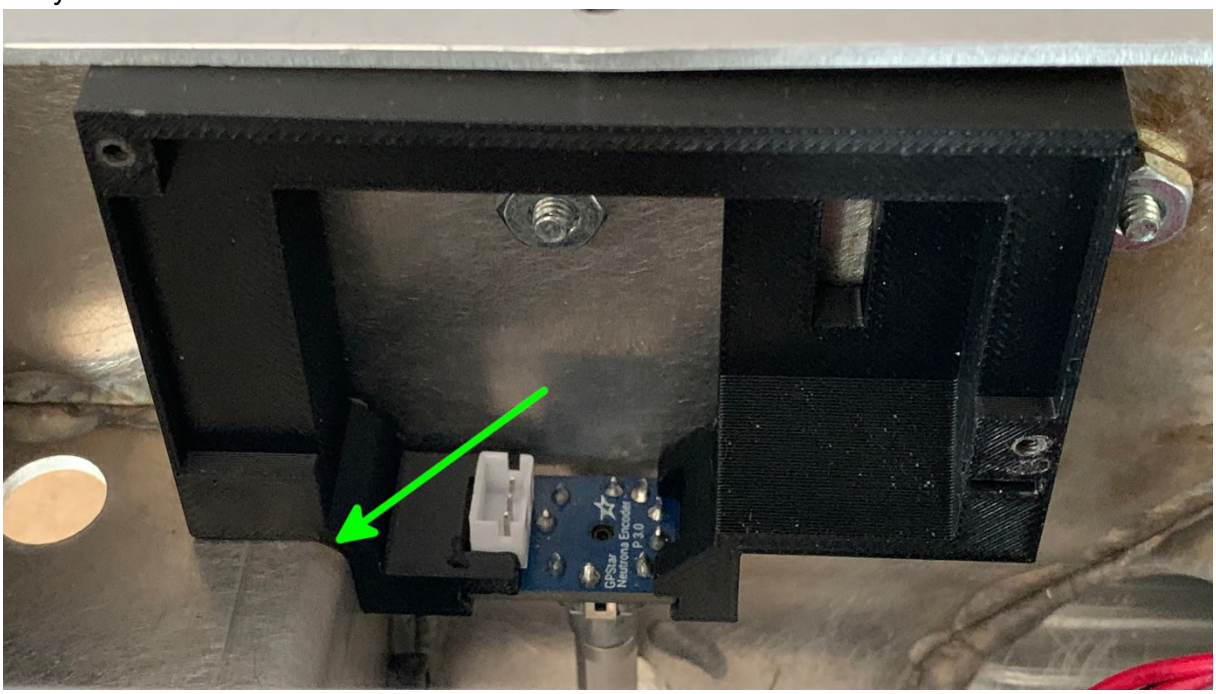


Once the motor is in the bracket, secure it with the motor cover and included m3x16 screws.

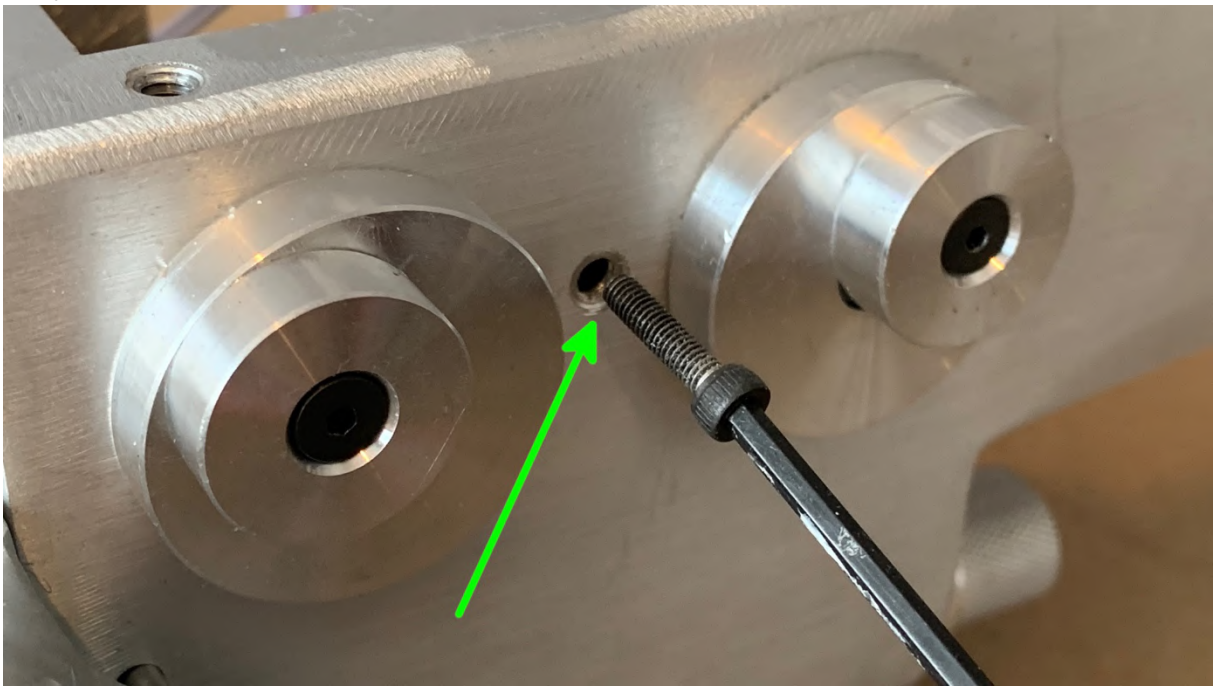


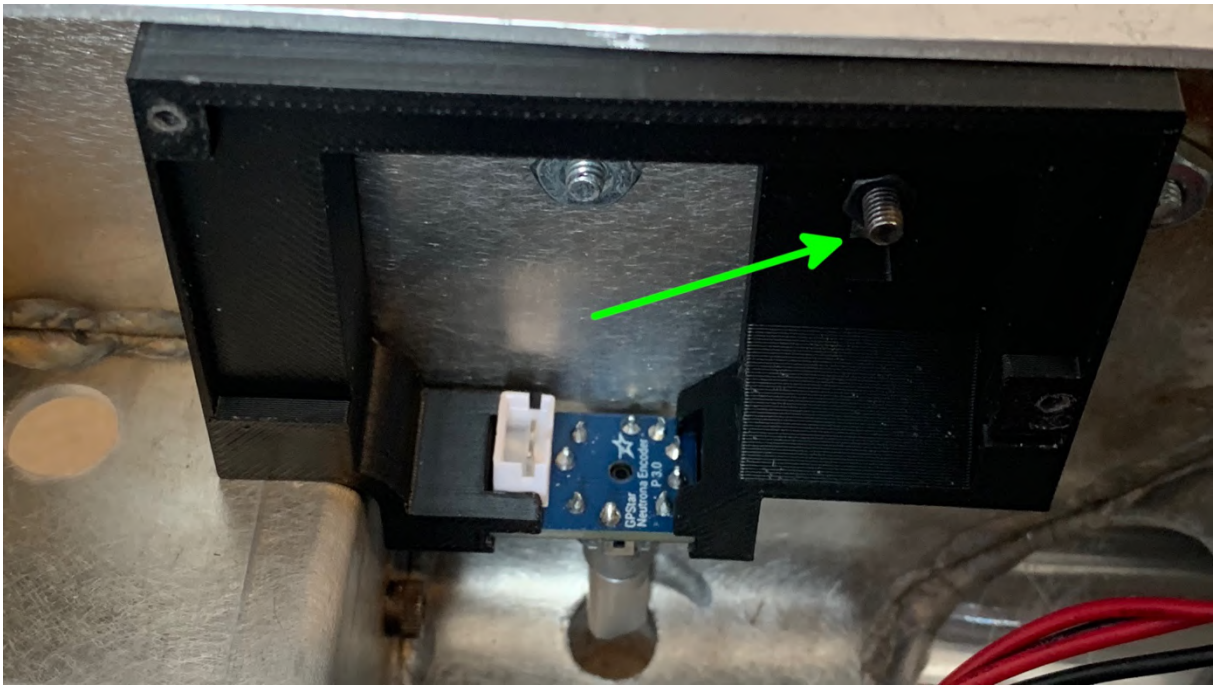


Install the main mounting bracket into the Neutrona Wand. Adjust the height of the bracket by sliding it up or down so the curve of the mounting bracket is resting on the Neutrona Wand body.

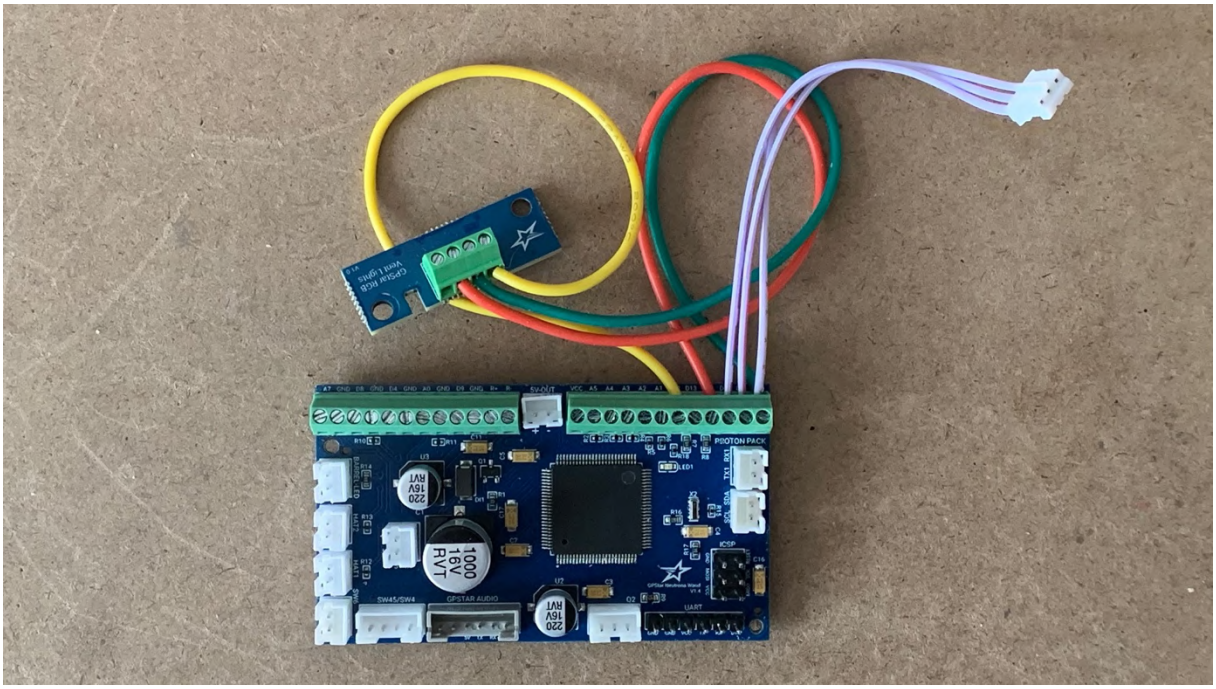


Use the included m3x12 screw, nut and the existing hole on the side of the Neutrona Wand body to secure the bracket.





Connect the GPStar RGB Vent Light and the GPStar Neutrona Wand encoder cables to the GPStar Neutrona Wand board.

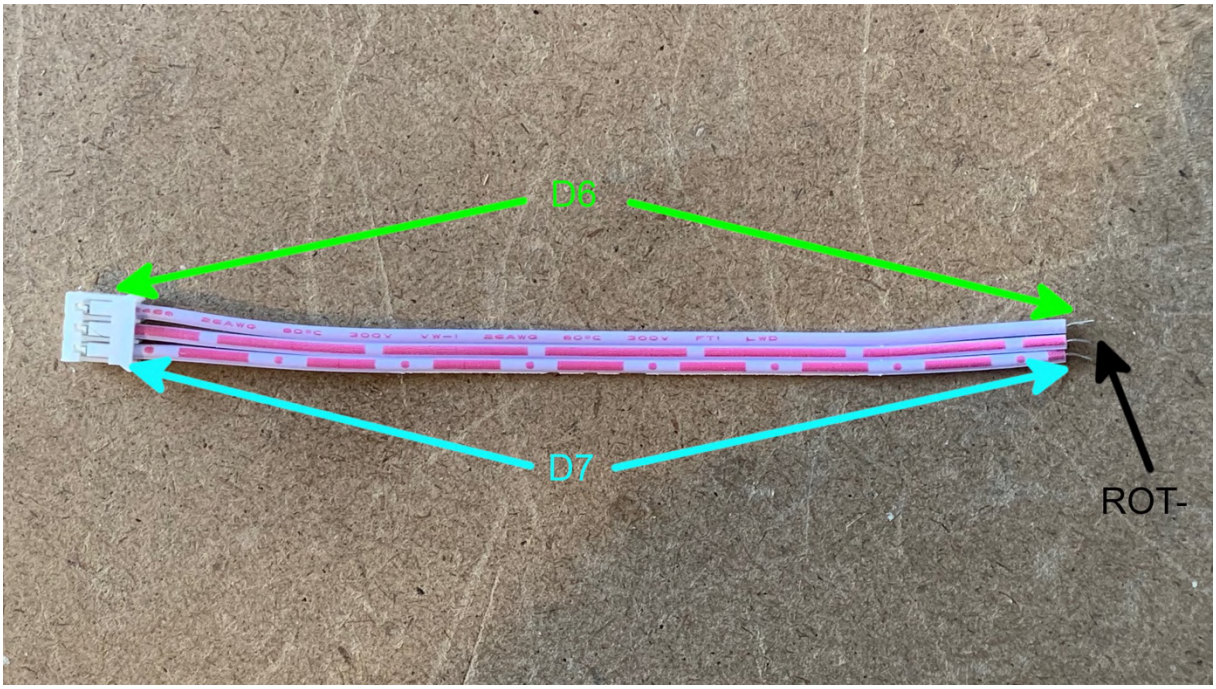


Looking at the photo below of the cable for the Neutrona Wand Encoder, connect the wires as indicated to the GPStar Neutrona Wand board.

B -> D6

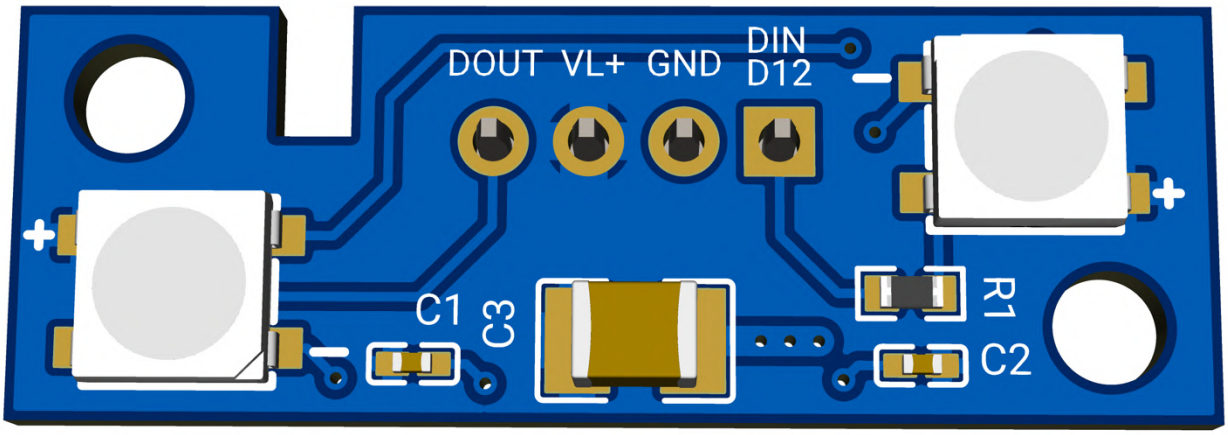
C -> ROT-

A -> D7



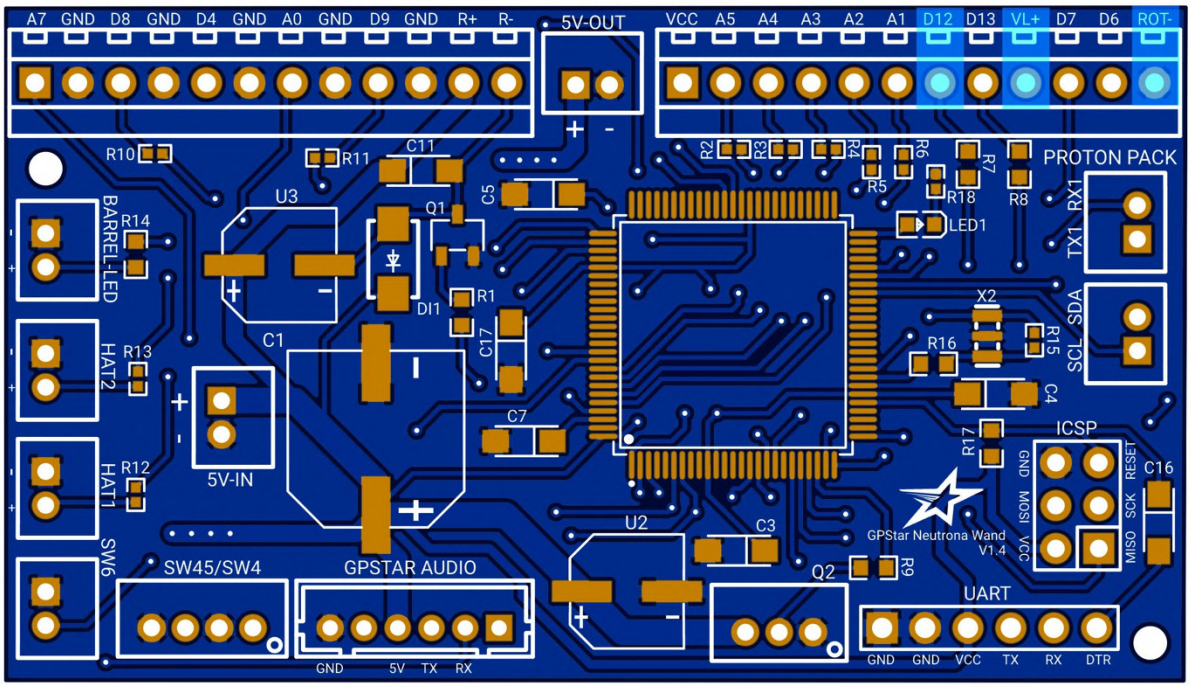
There are two different vent light options available that you can connect to the system.

GPStar RGB Vent Light: To connect the GPStar RGB Vent Light to the GPStar Neutrona Wand, follow the hookup diagram below :



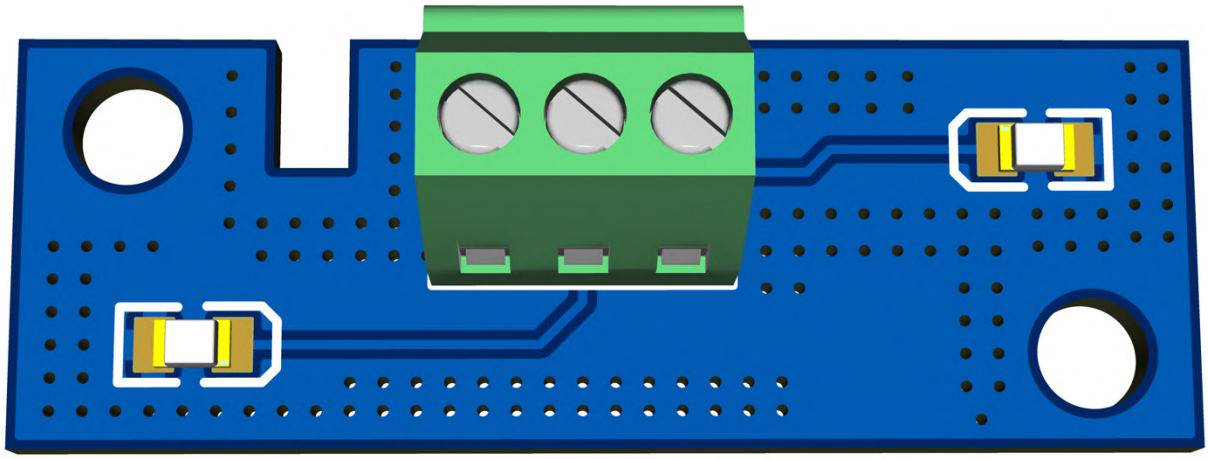
** Note that there will be two wires sharing the ROT- connection. One from the GPStar Neutrona Encoder and one from the GPStar RGB Vent Light.

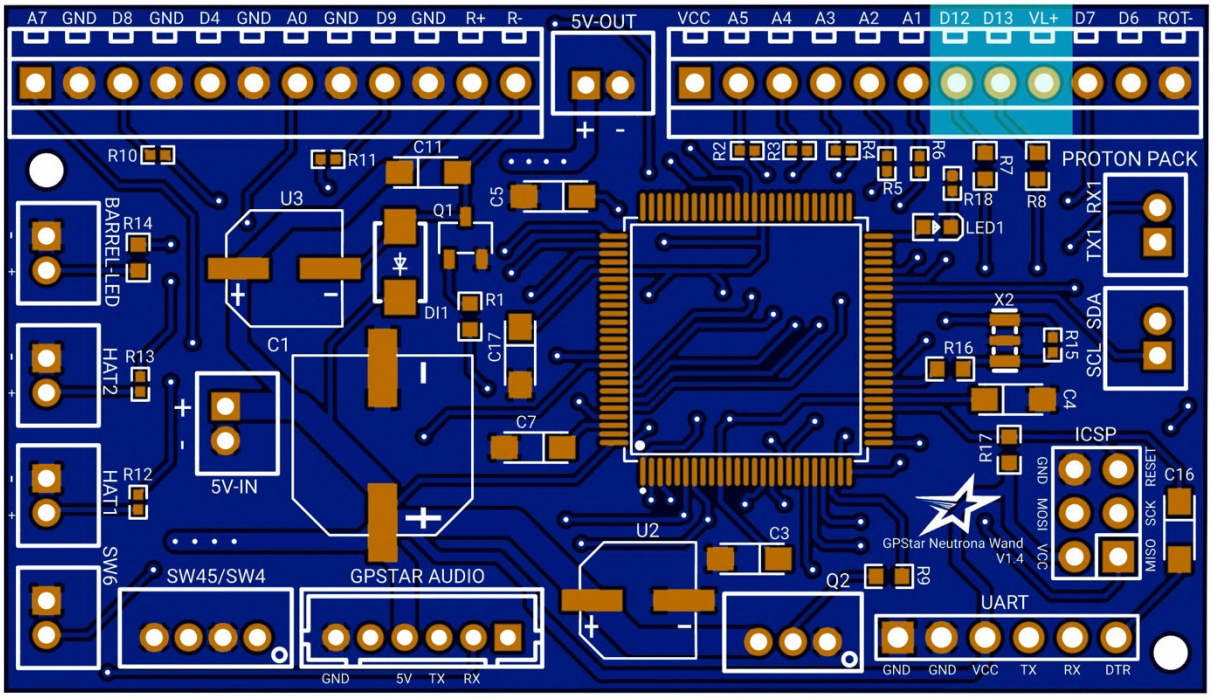
VL+ -> VL+
D12 -> D12
GND -> ROT-



GPStar Vent Light: To connect the GPStar Vent Light to the GPStar Neutrona Wand, follow the hookup diagram below :

V+ -> VL+
TOP -> D12
VENT -> D13

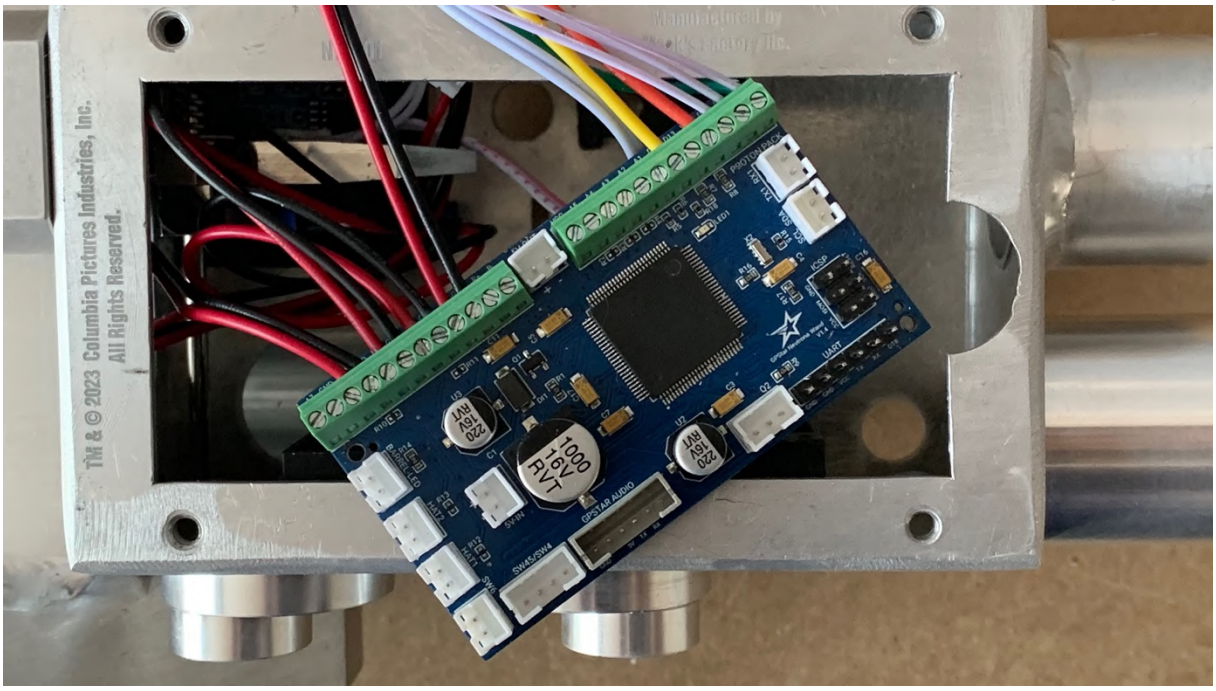


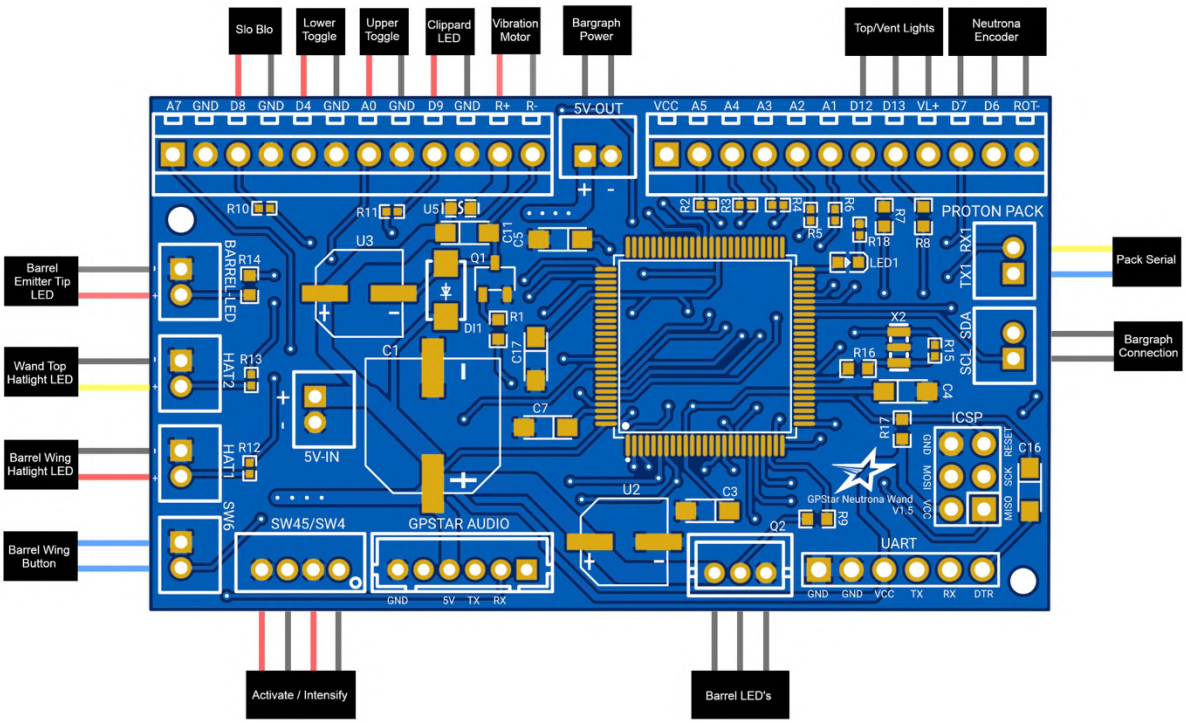


Connect the upper toggle switch, lower toggle switch, front hat light led that is under the Clippard valve and Slo-Blo led to the GPStar Neutrona Wand board.

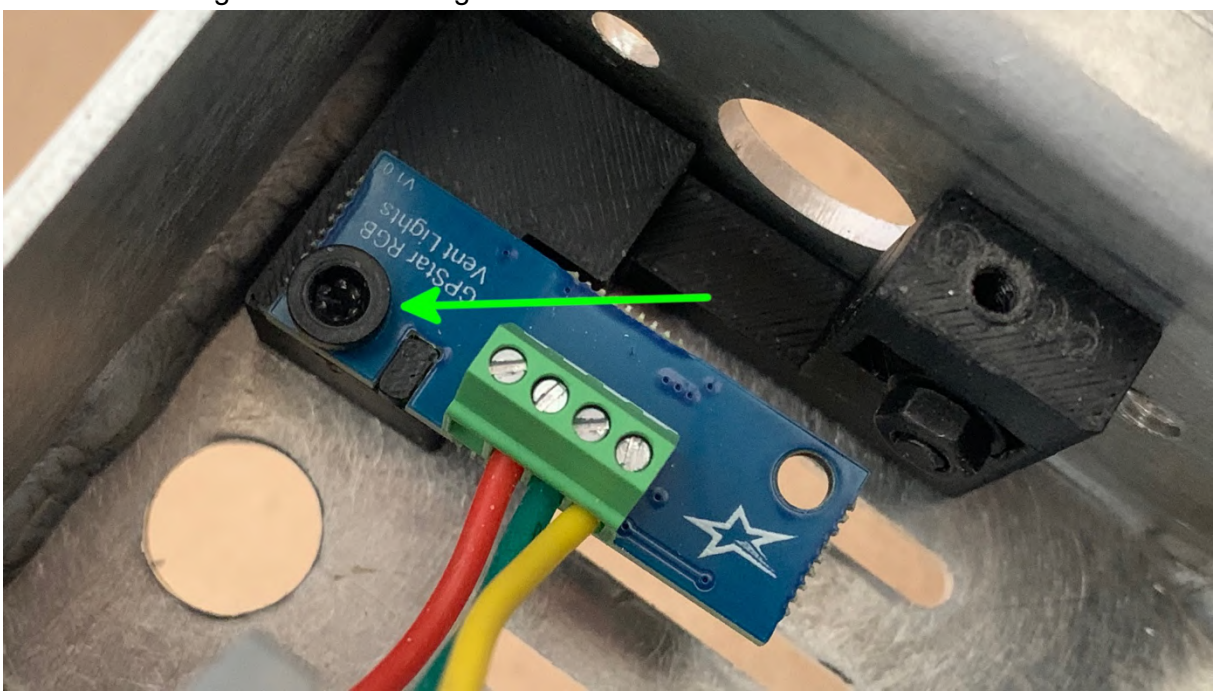
Vibration Kit Variant: If you have the vibration kit, connect the vibration motor to the board.

IMPORTANT : It is important to match the wire colours of the led wires as per the diagram.

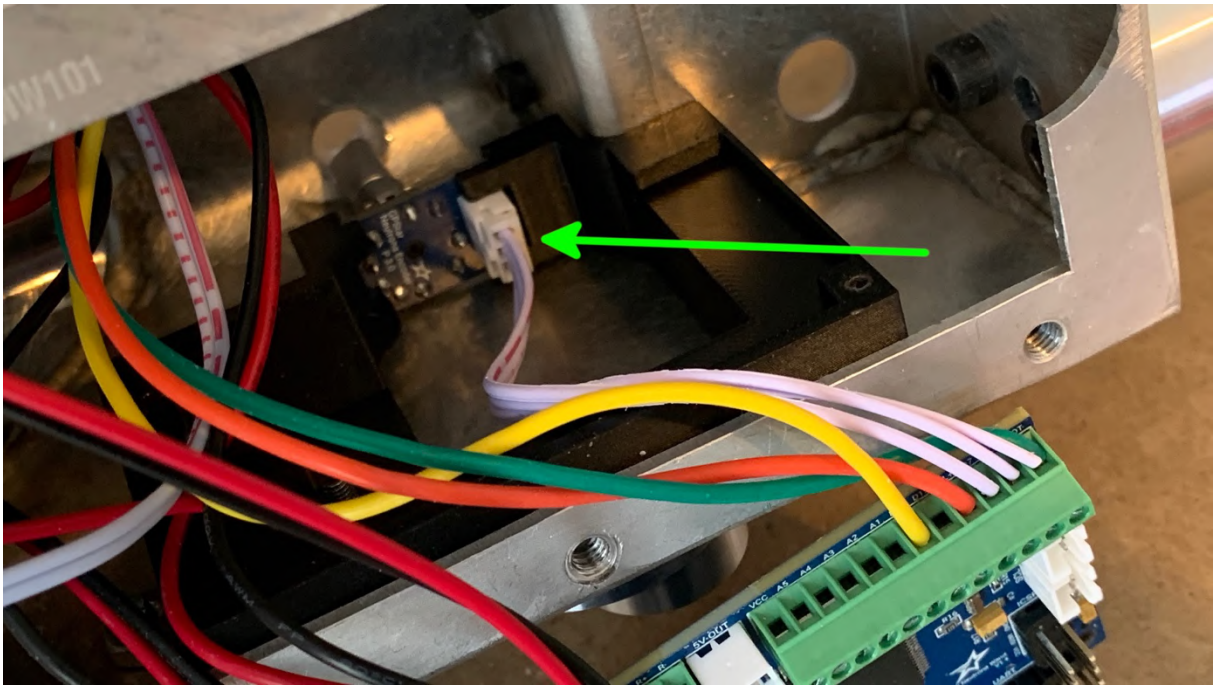




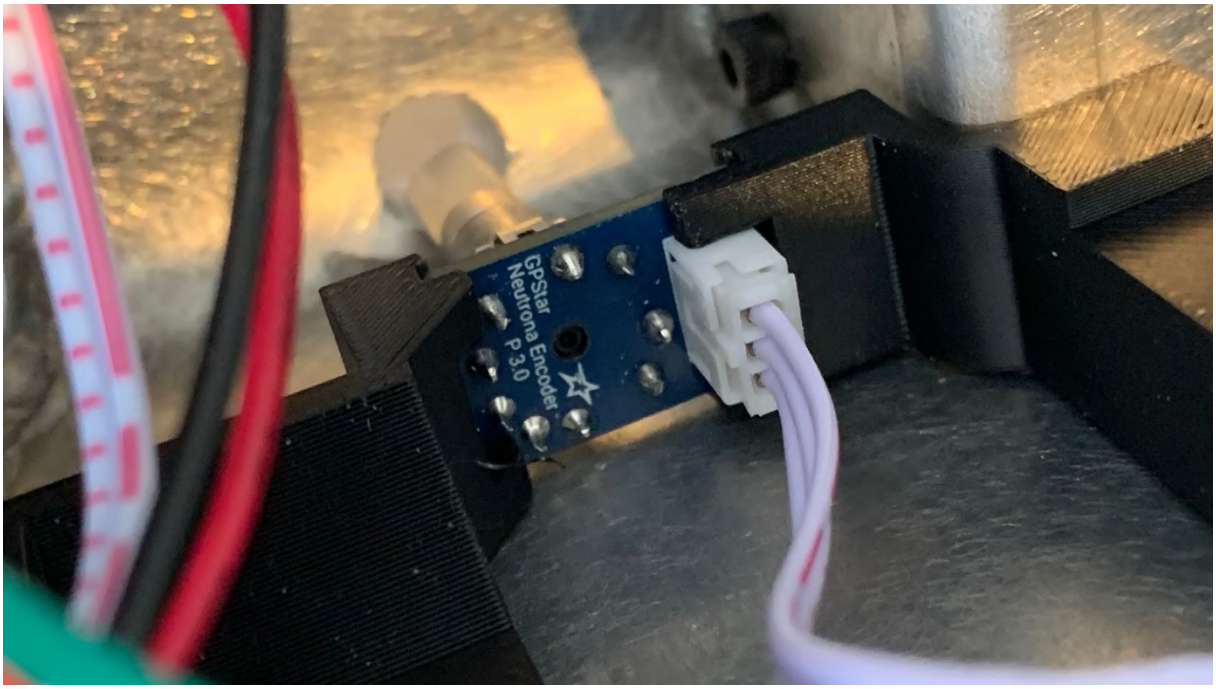
Install the vent light onto the vent light mount with the included m3x4 screw.



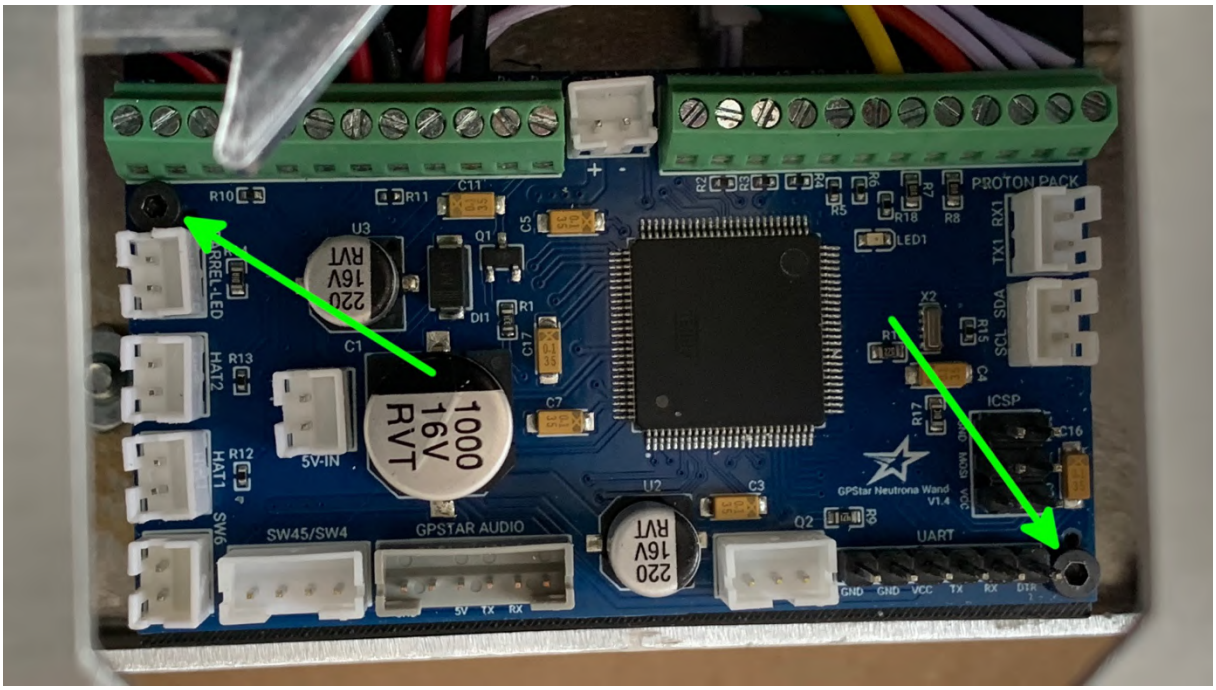
Connect the GPStar Neutrona Wand Encoder to the GPStar Neutrona Wand board from the JST-PH cable already wired to the GPStar Neutrona Wand board from the previous steps.

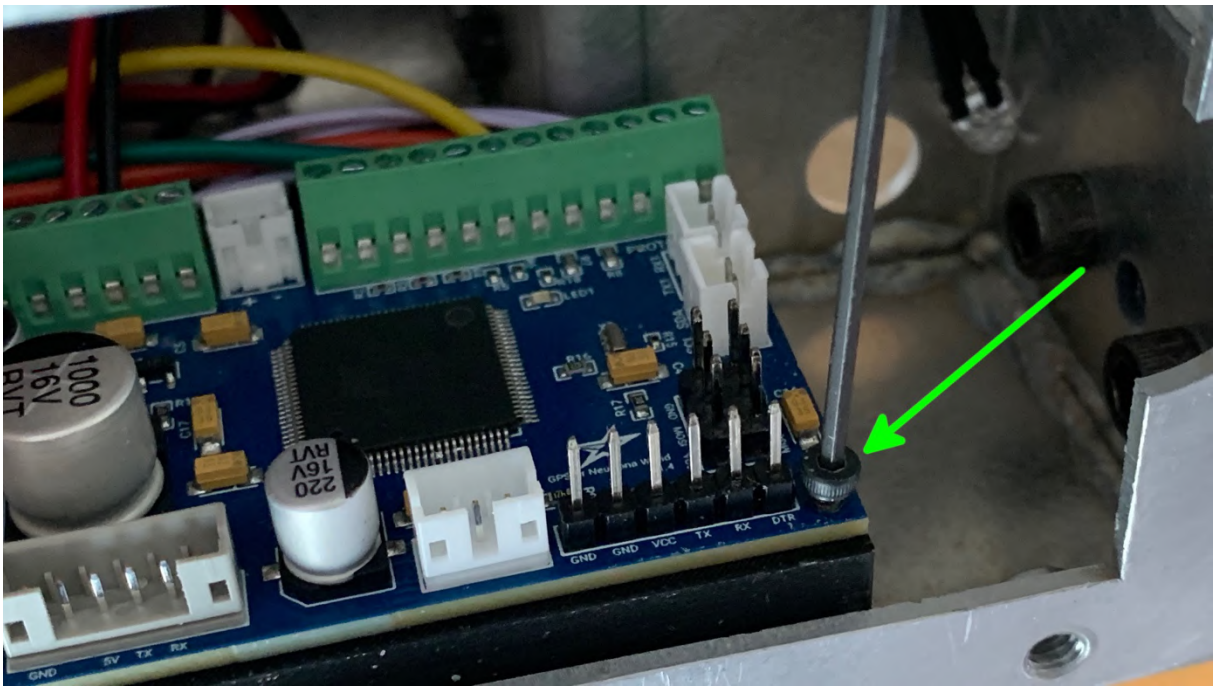


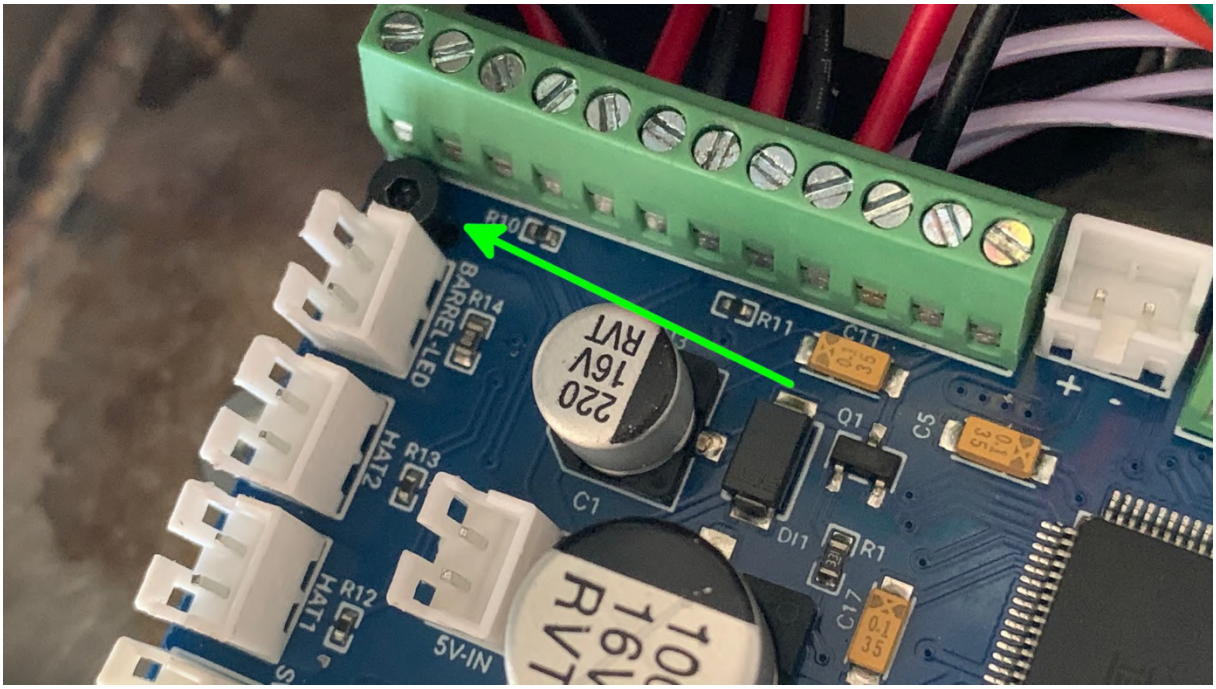
When inserting the cable, support the bracket from the other side with your fingers so you do not break it when applying the force to insert the cable.



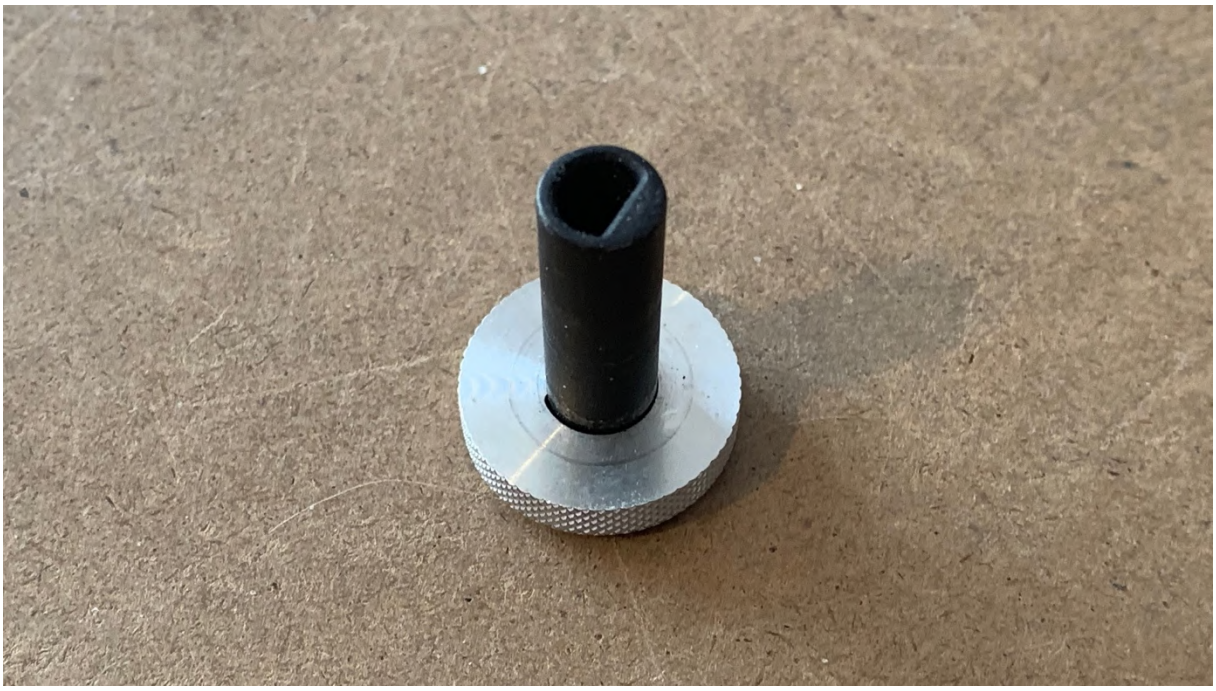
Install the GPStar Neutrona Wand board onto the main mounting bracket with the two included m2x4 screws.

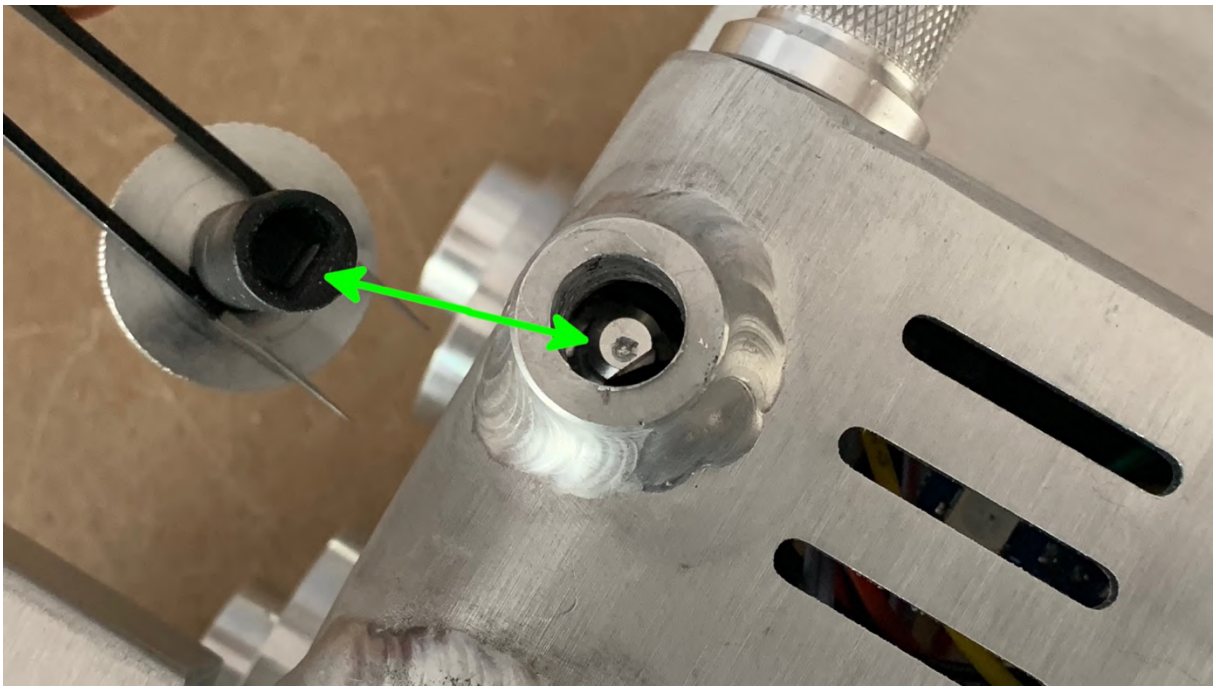


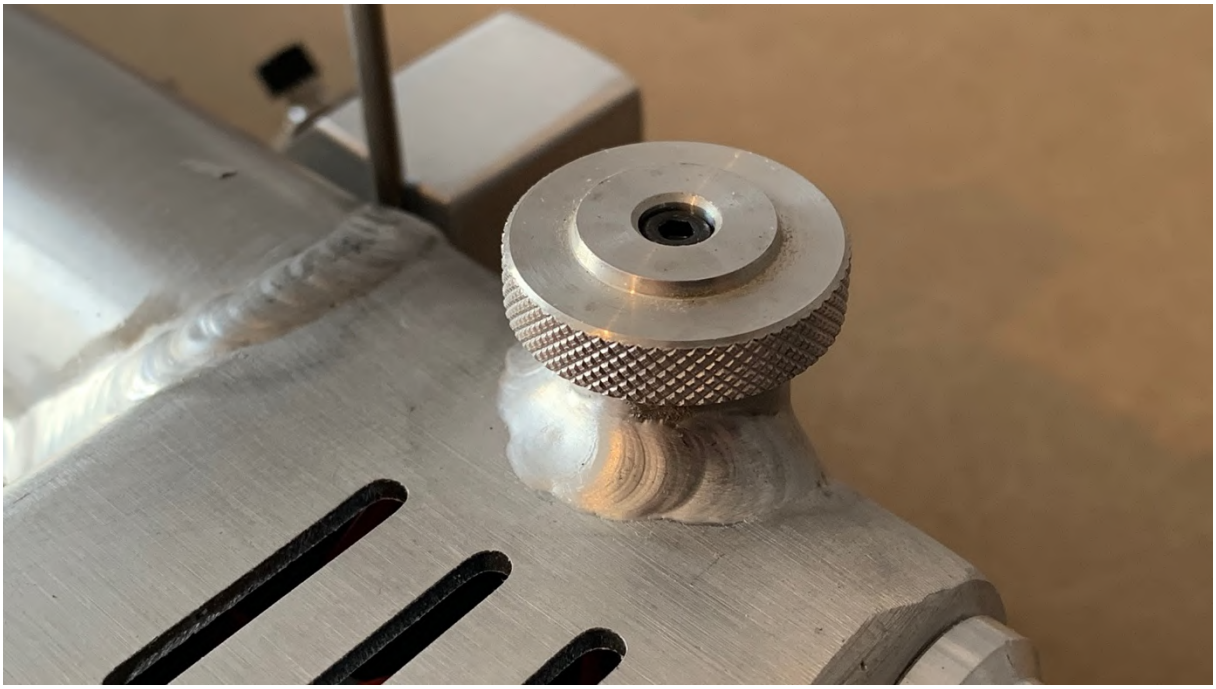

1000
16V
RVT
220
16V
RVT
GND
5V
TX
RX
GND
GND
VCC
TX
RX
DTR


R10
R14
BARREL-LED
R11
C11
220
16V
RVT
Q1
C5
HAT2
R13
C1
D11
R1
HAT1
R12
C17
5V-IN
+
-

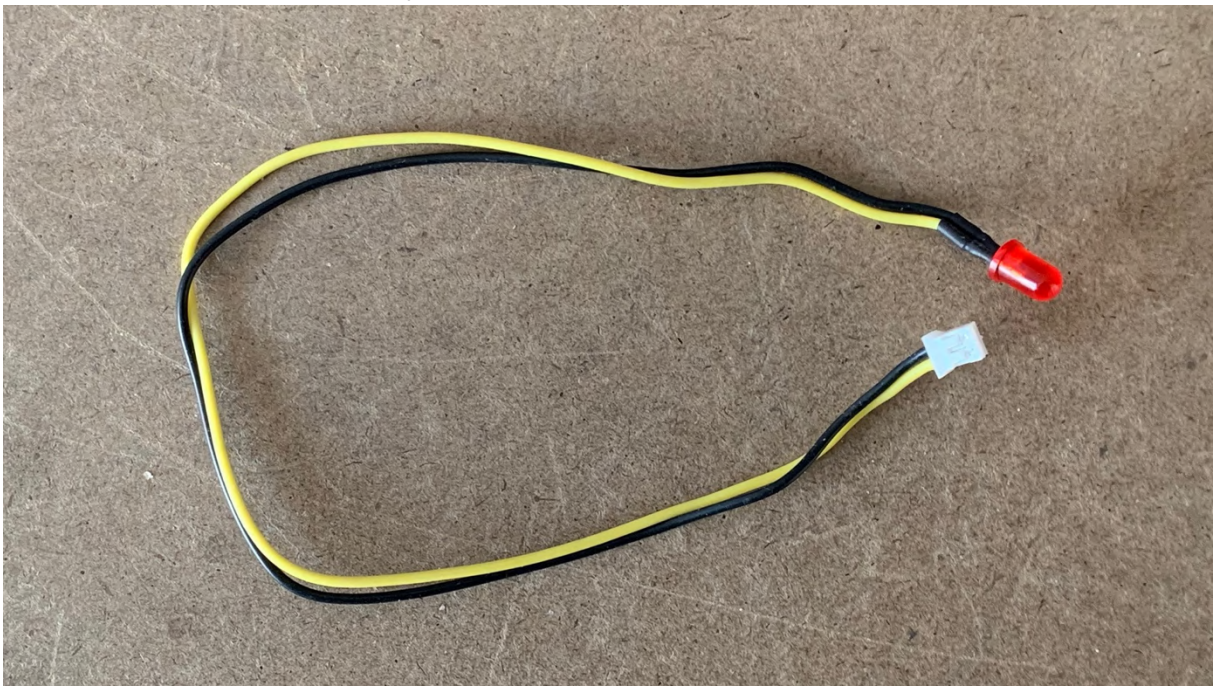
Install the top dial onto the included top dial shaft. If using the GPStar top dial, it will slot into the encoder shaft. Use the included m2.5x4 screw to secure it onto the shaft. If using a non GPStar top dial, you will need to enlarge the hole on the shaft to fit the screw size that came with the top dial that you have. Then line up the top dial shaft and slip it onto the GPStar Neutrona Encoder.

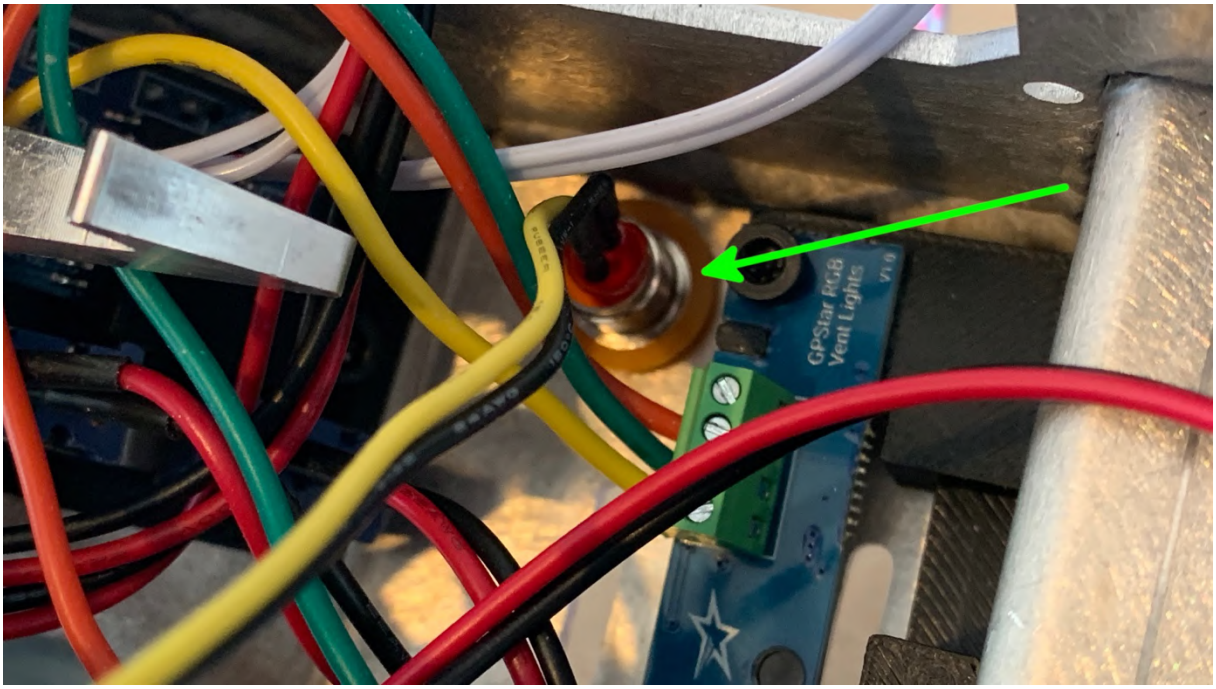




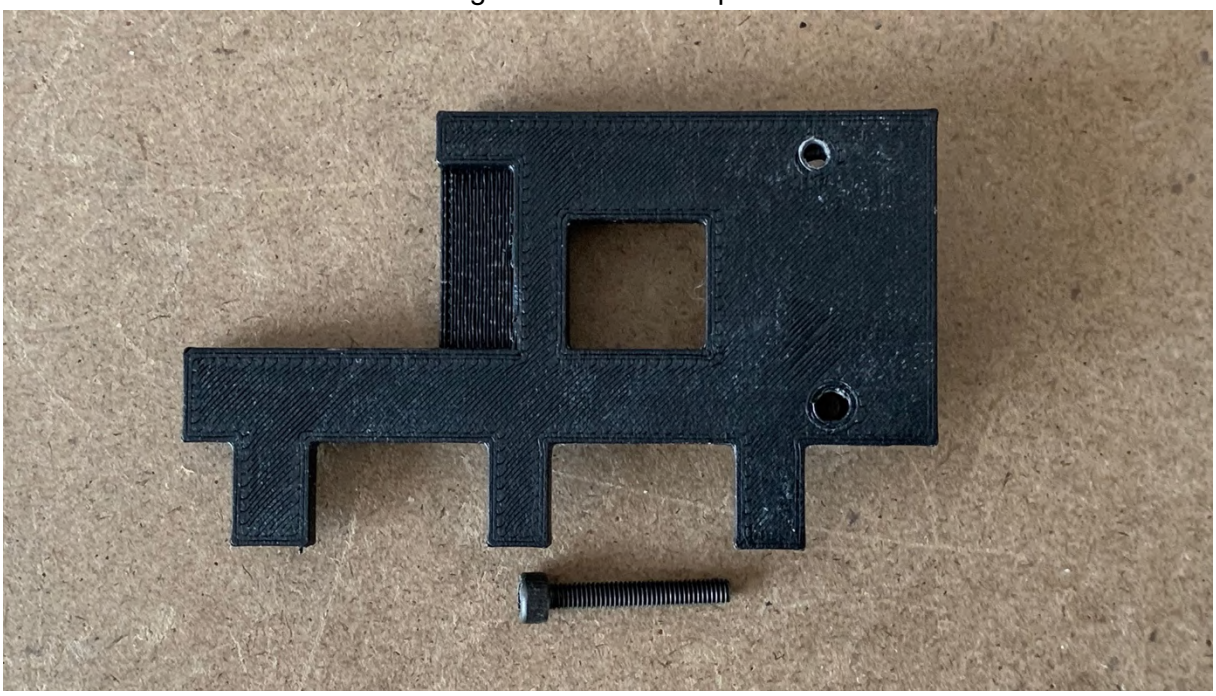


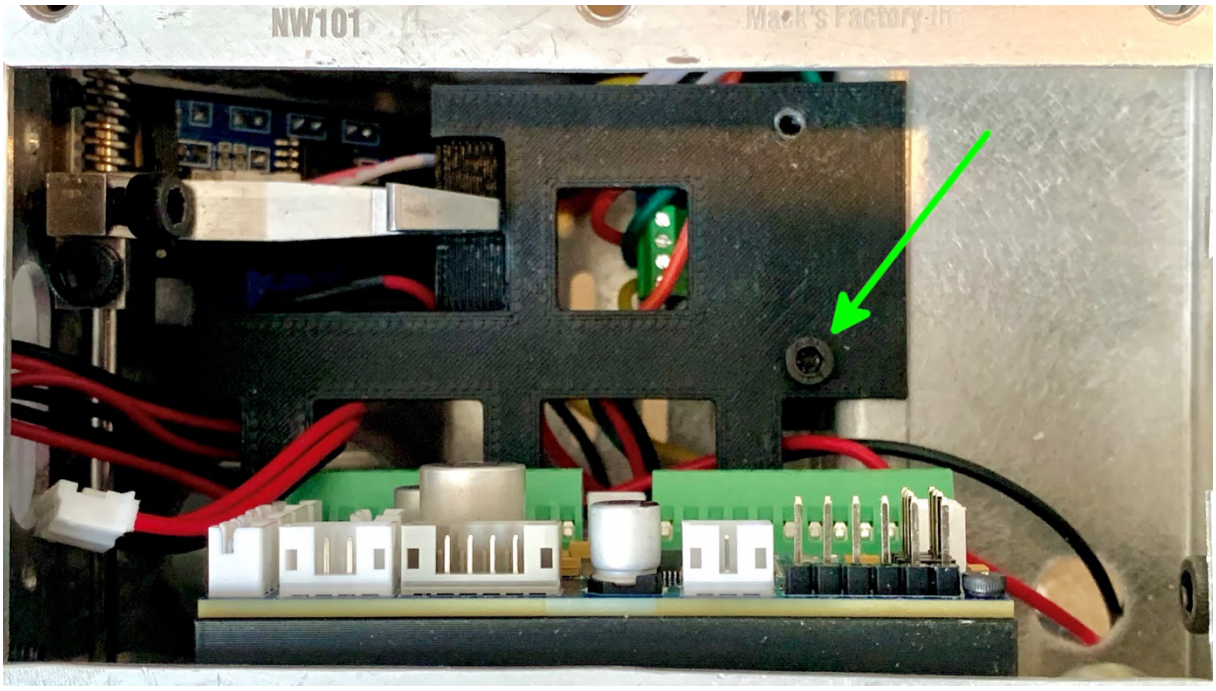
Install the top hat light led into the hat on the Neutrona Wand body. How you install the led will be up to you, some use hot glue, clear silicone, screws, etc. Do not plug the led it into the GPStar Neutrona Wand board yet.





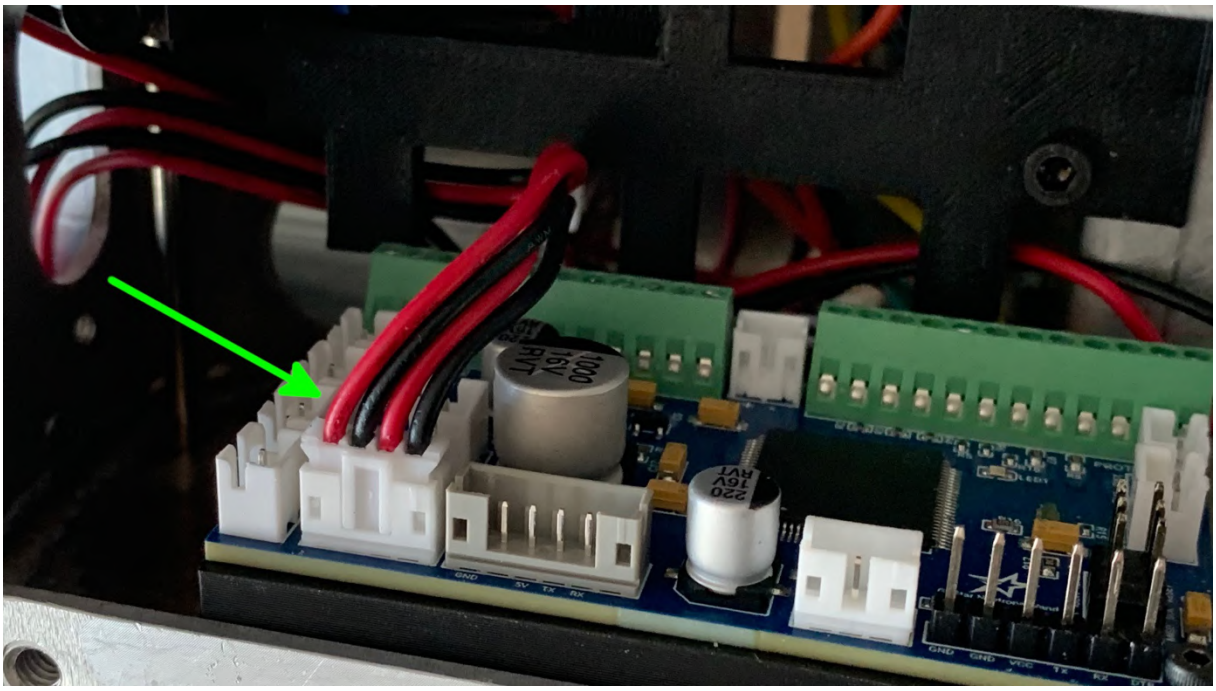
Connect the wire cover to the vent light mount with the provided m3x16 screw.

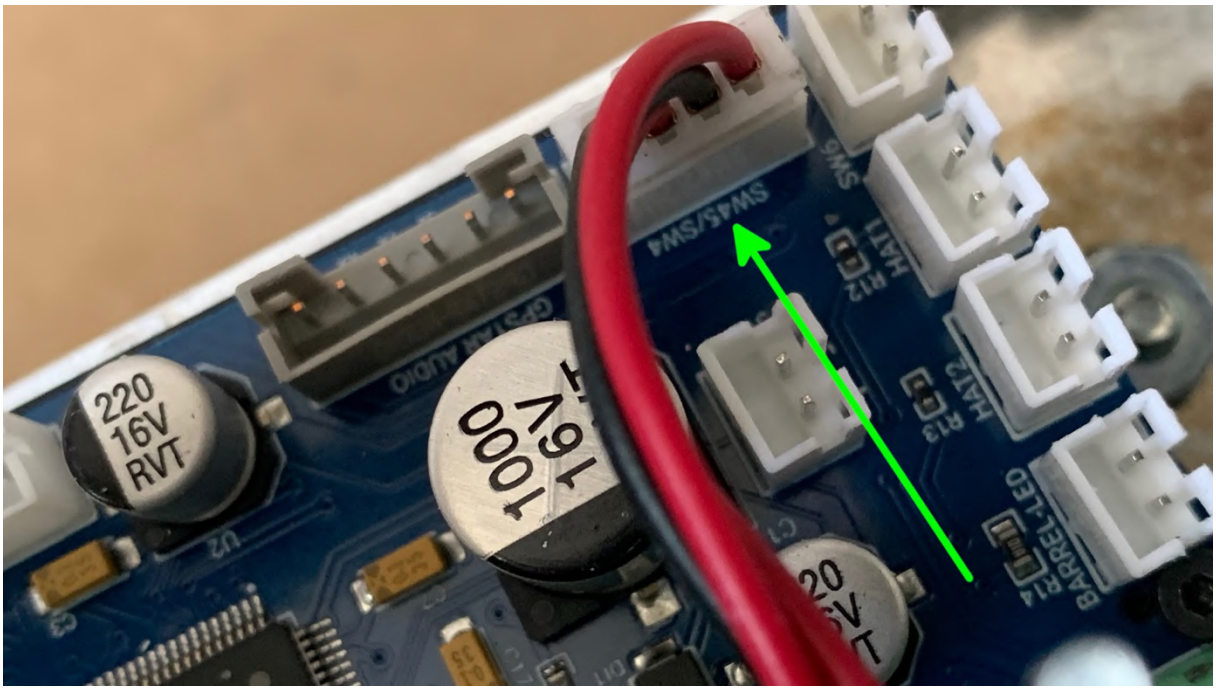




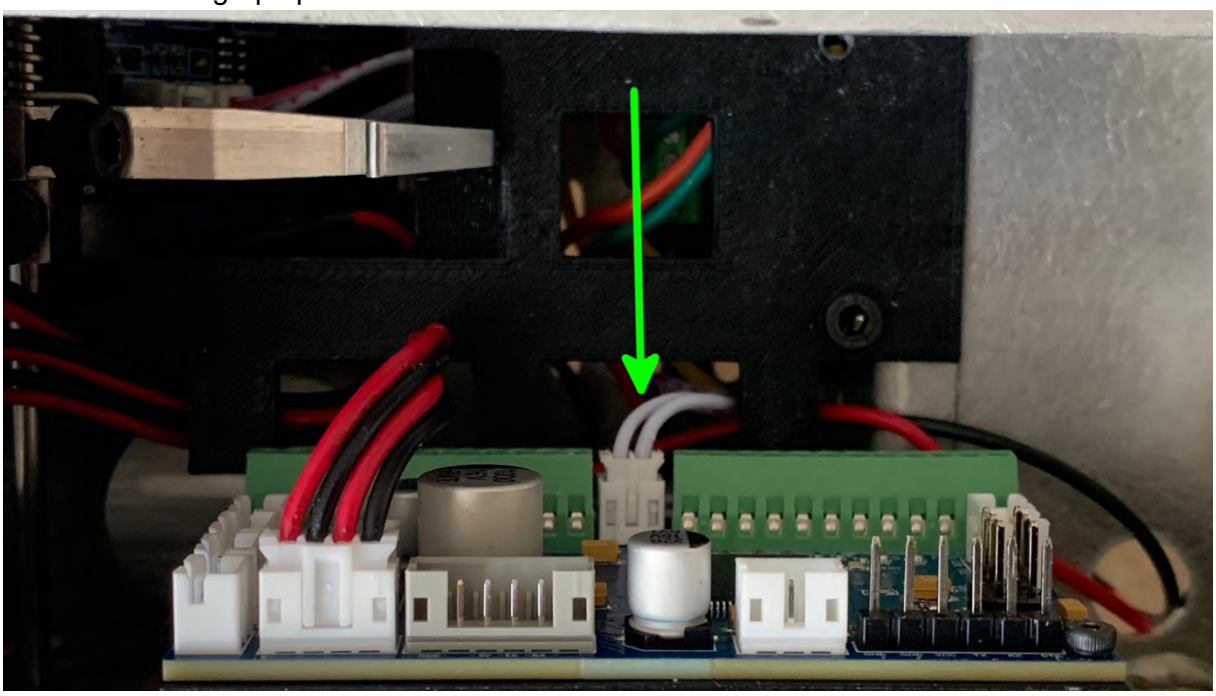
Connect the 3 pin JST-PH connector of the Activate/Intensify switches to the SW45/SW4 connector of the GPStar Neutrona Wand board.

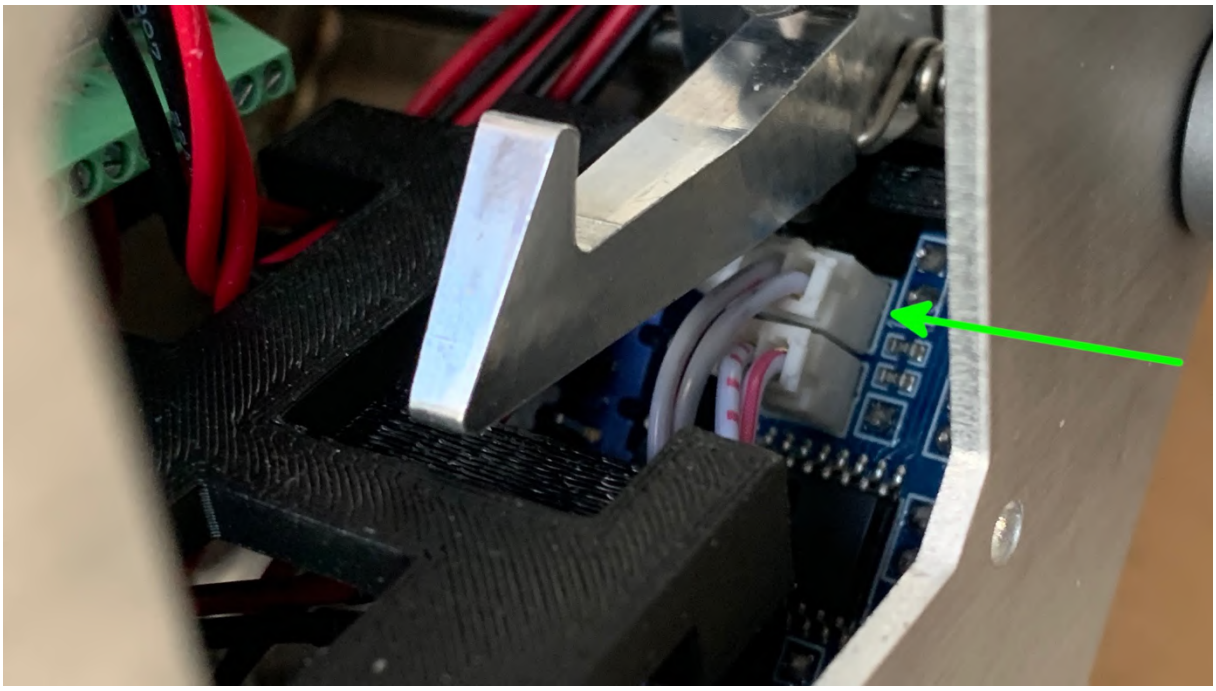
Tip : When dealing with wire management, you can loosen the screw on the wire cover to help maneuver and sort your wires. Do not forget to tighten it back down when you are done.



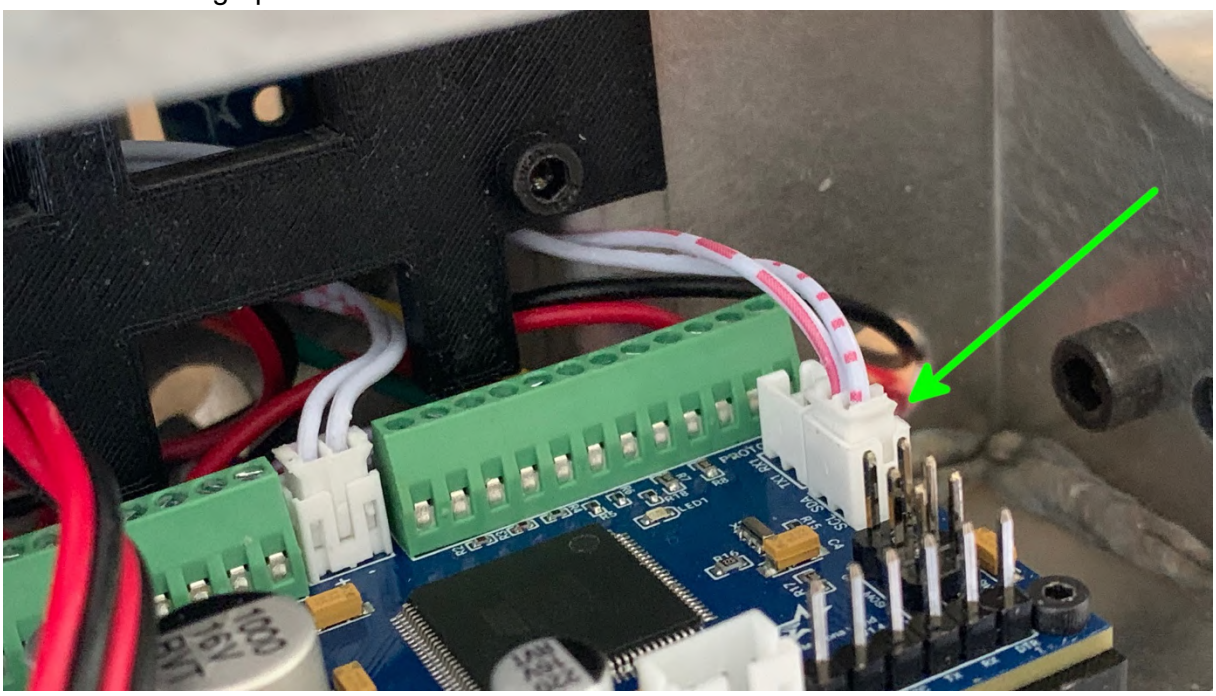


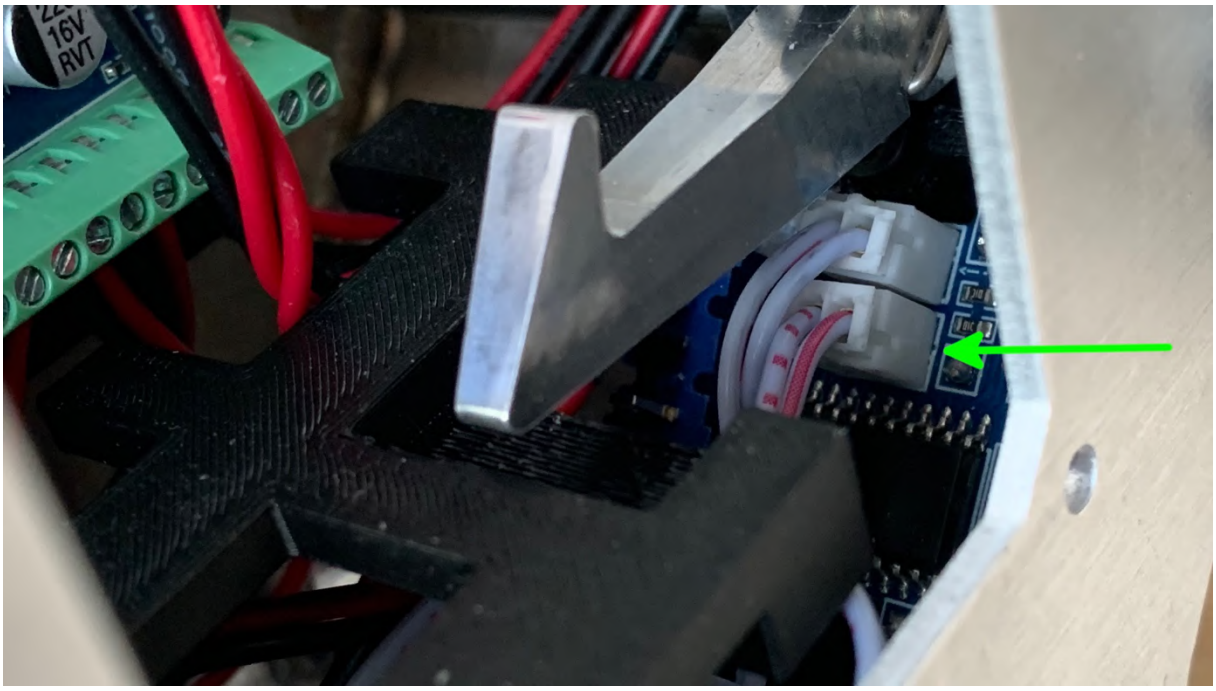
Connect the bargraph power cable to the GPStar Neutrona Wand board.



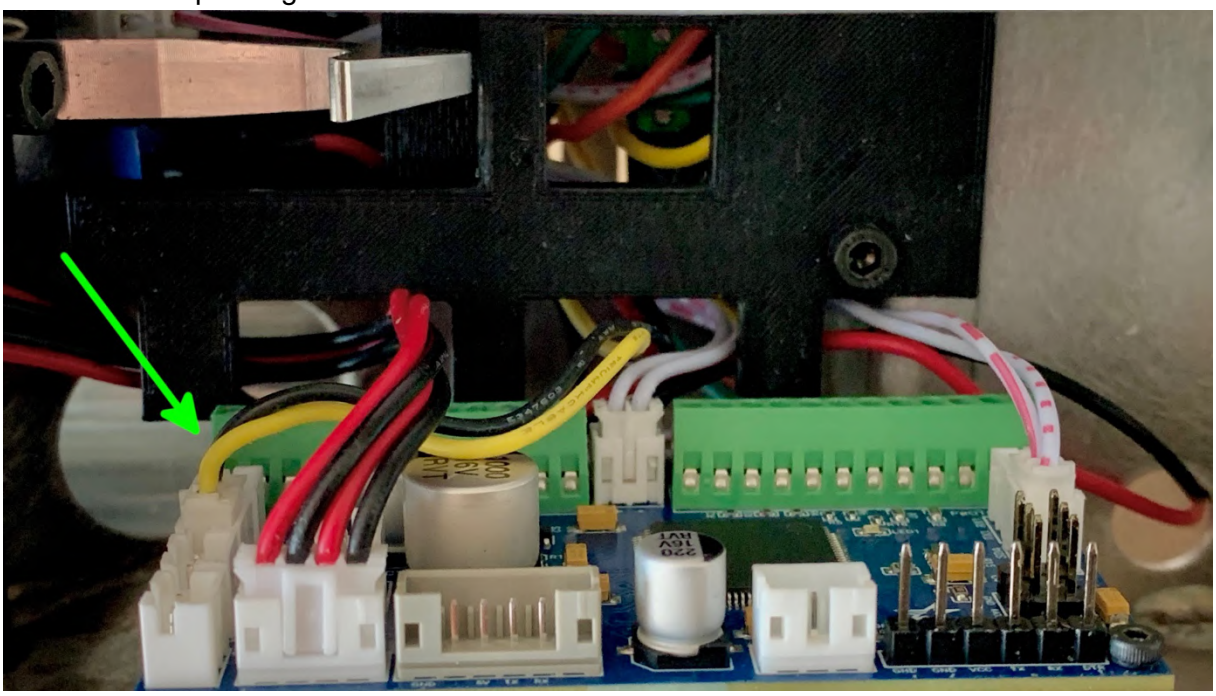


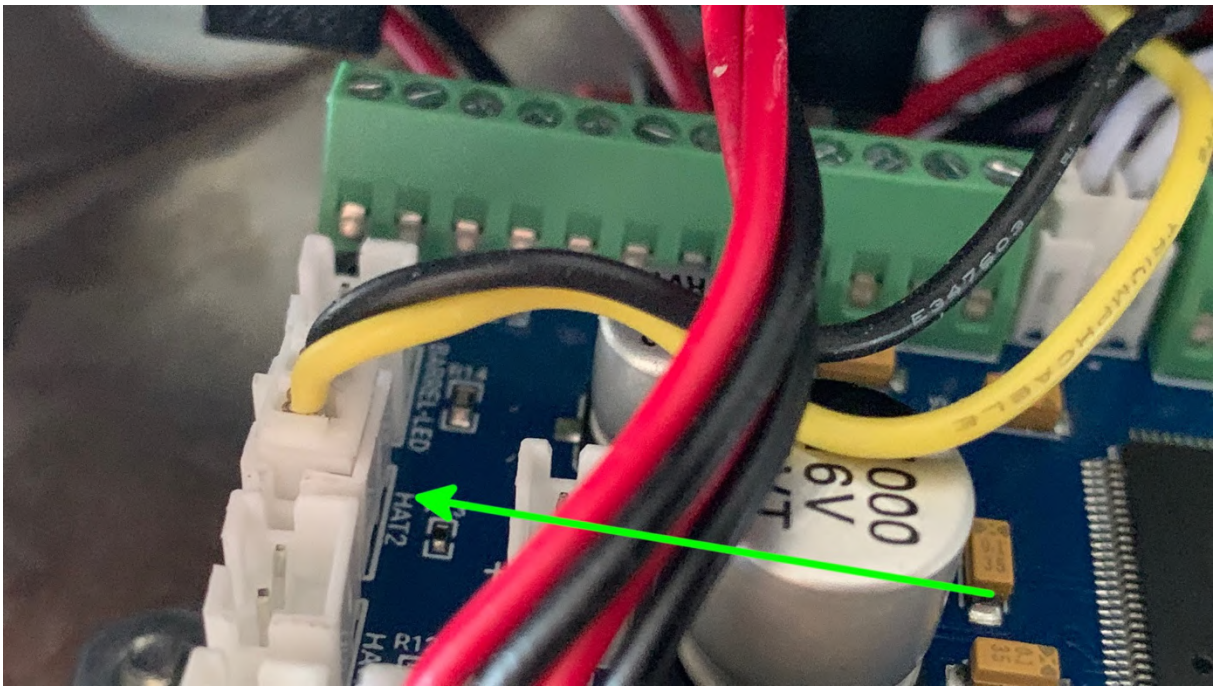
Connect the bargraph data cable to the GPStar Neutrona Wand board.





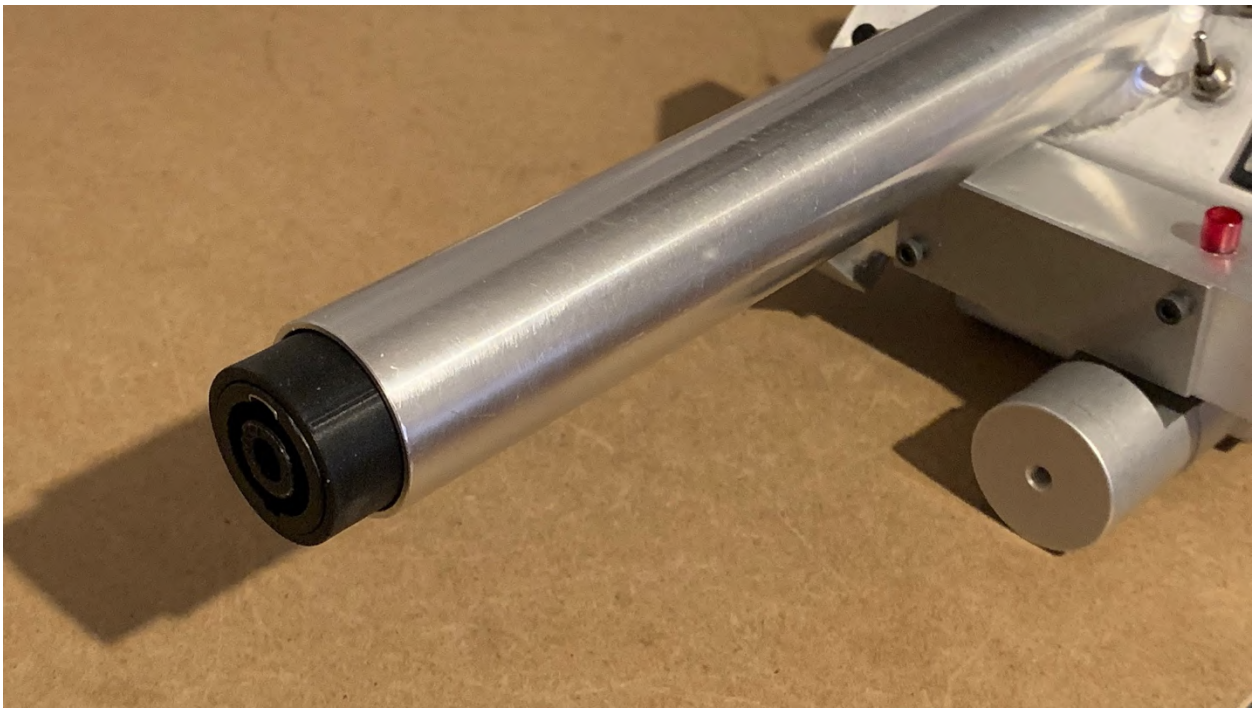
Connect the top hat light led into HAT2 connector of the GPStar Neutrona Wand board.





Connection to the Proton Pack :

Option #1 : Neutrik.

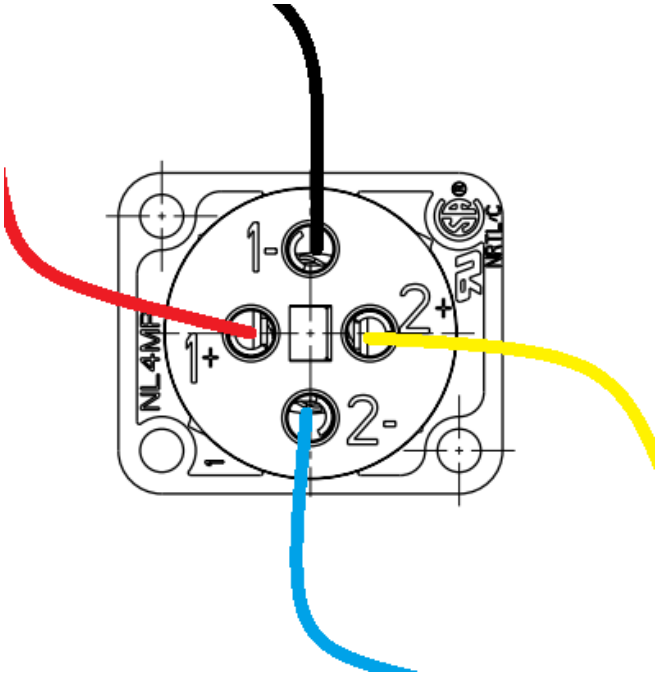


Important Tip : Ferrules

For securing the wires from the hose Neutrik NL4FXX-W-S and the wires from the Neutrona Wand handle Neutrik NL4MP-ST, E0308 Ferrules for 22awg wires are highly recommended so that they can be secured when clamping into the Neutrik terminals. Alternate solutions is to add solder to the ends of the wires to make them thicker or fold the ends over on themselves to make them thicker.

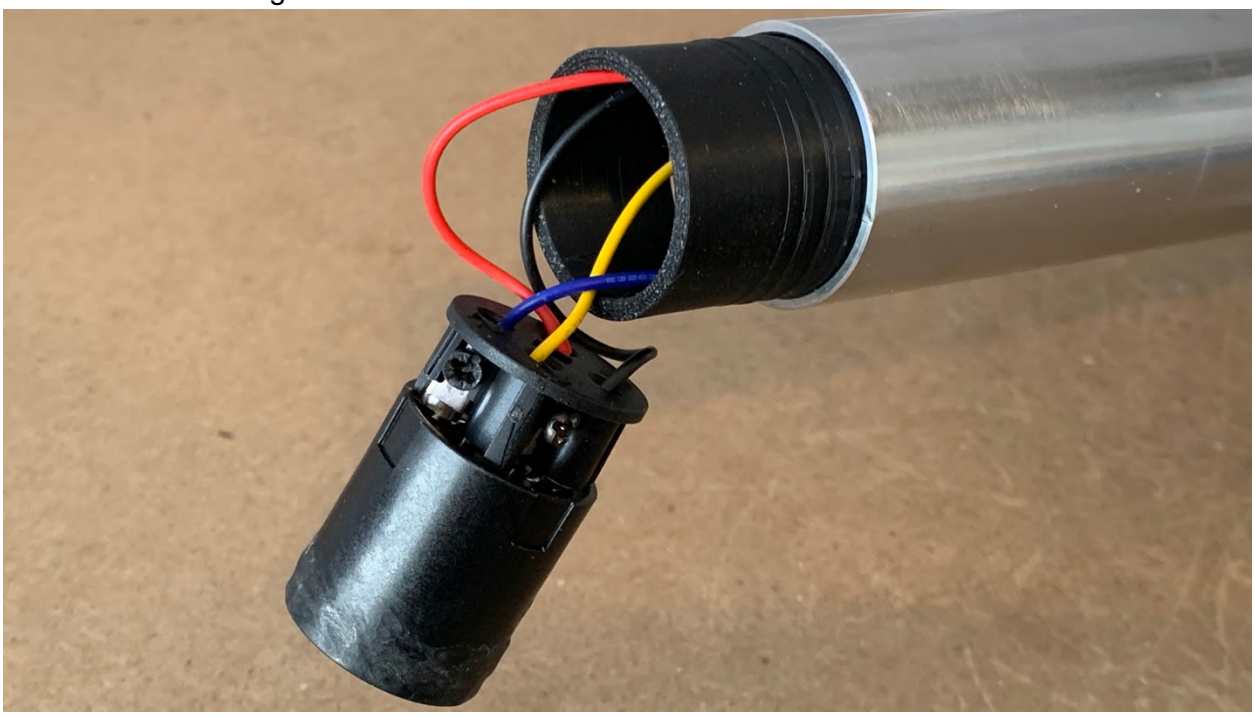
E0308

Secure the wires into the Neutrik connector as follows. Red wire to +1, black wire to -1, yellow wire to 2+ and the blue wire to 2-.



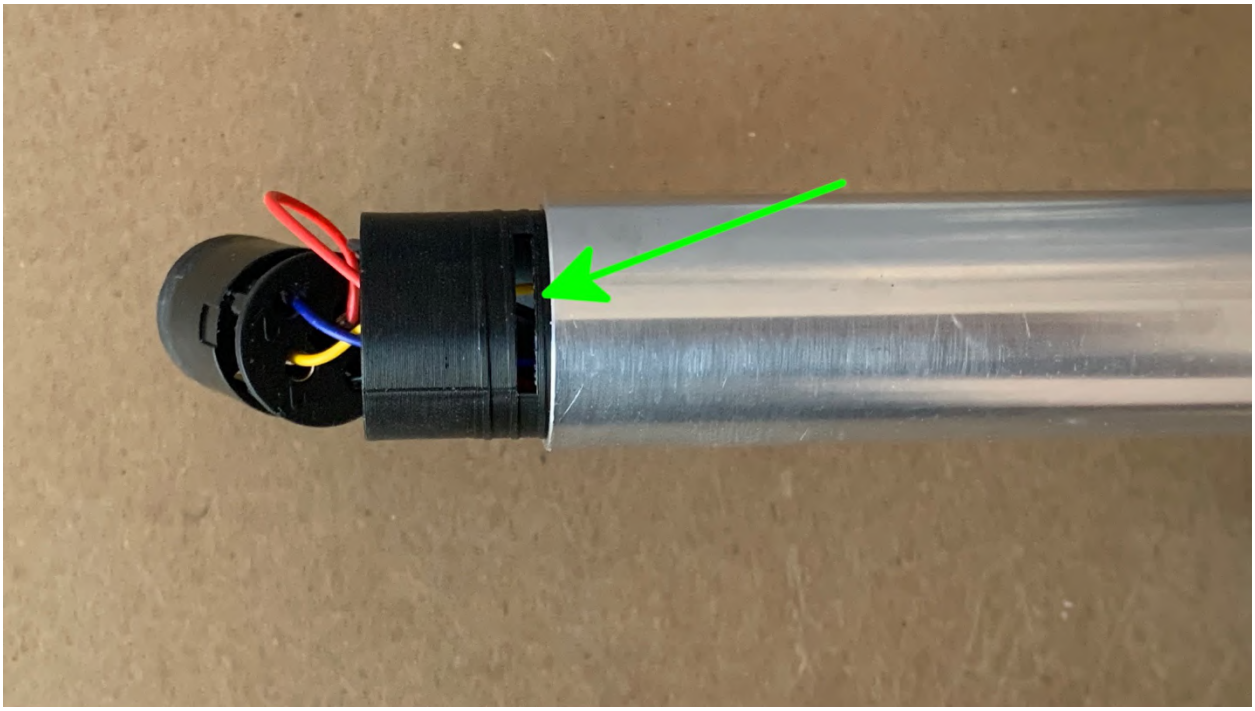
IMPORTANT TIP: Make sure the terminals clamp down on the tinned wire end or ferrules and NOT the plastic covering aka do not insert the wire too deep. If you have trouble having the wires stay secured, refer to the ferrules recommendation tip above.

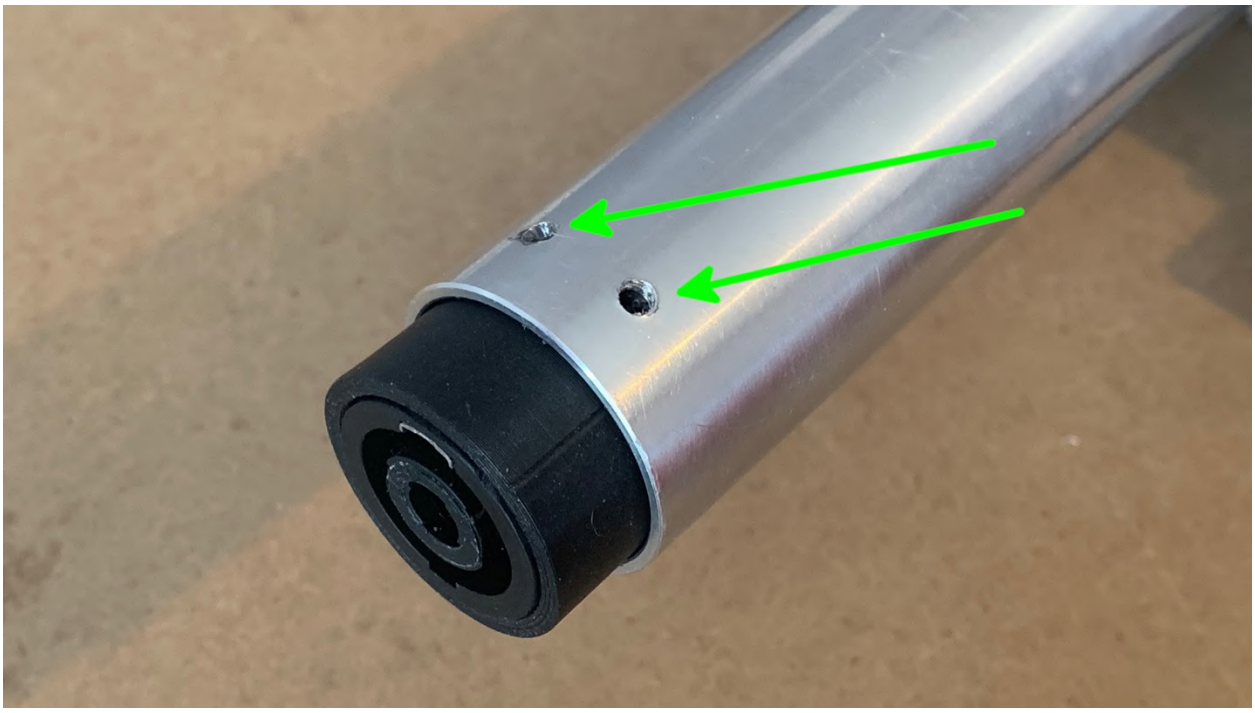
Slide the wires through the wand connector and then secure them to the Neutrik connector.

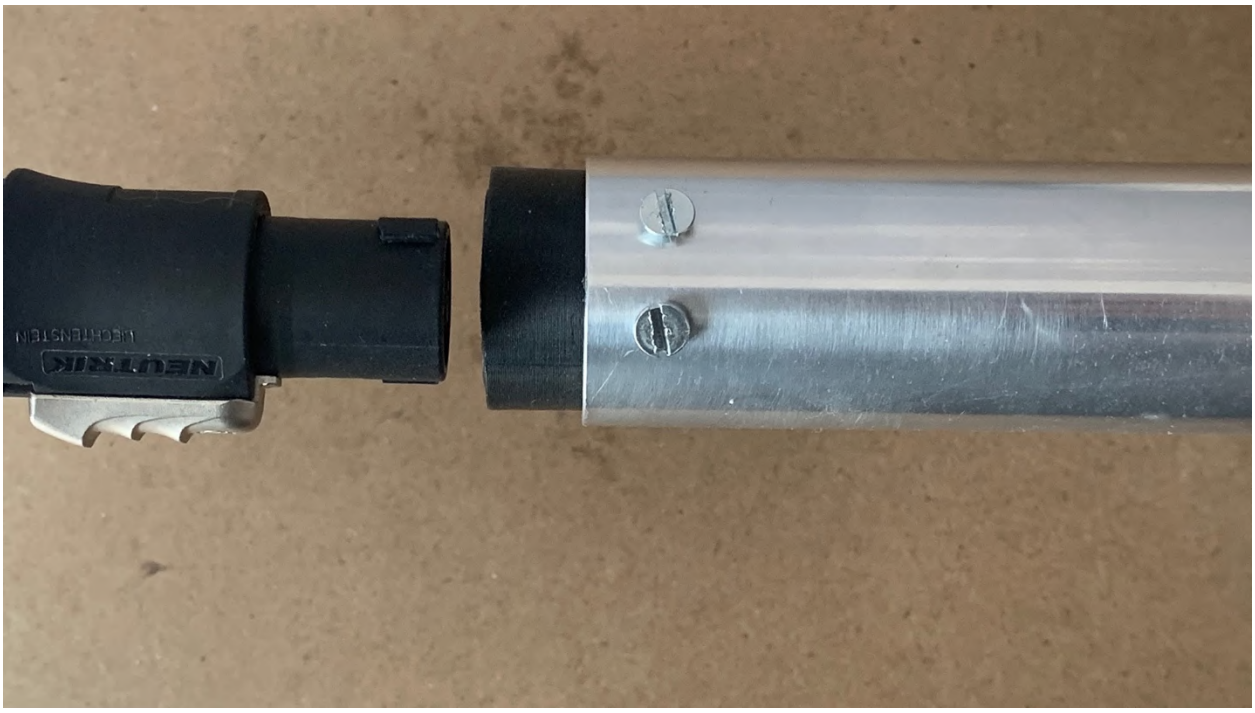


Slide the assembly into the wand handle. Line up the slot on the connector with the 2 holes on the Mack's Factory Neutrona Wand handle and secure it with the two included screws.

Note: Only the black anodized Mack's Factory Neutona Wands come with the handle holes pre-drilled. The raw aluminium finished Mack's Factory Neutrona Wands lack the pre-drilled holes in the handle and you will need to add them yourself, or you can also secure the connector with glue.

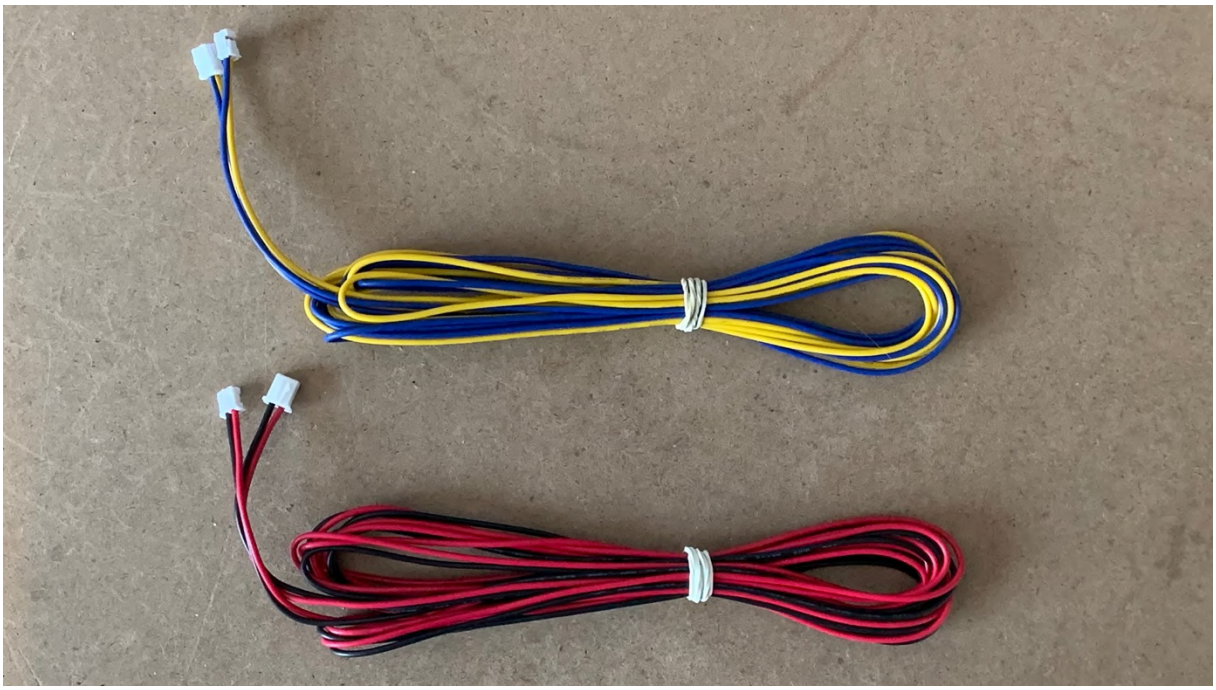




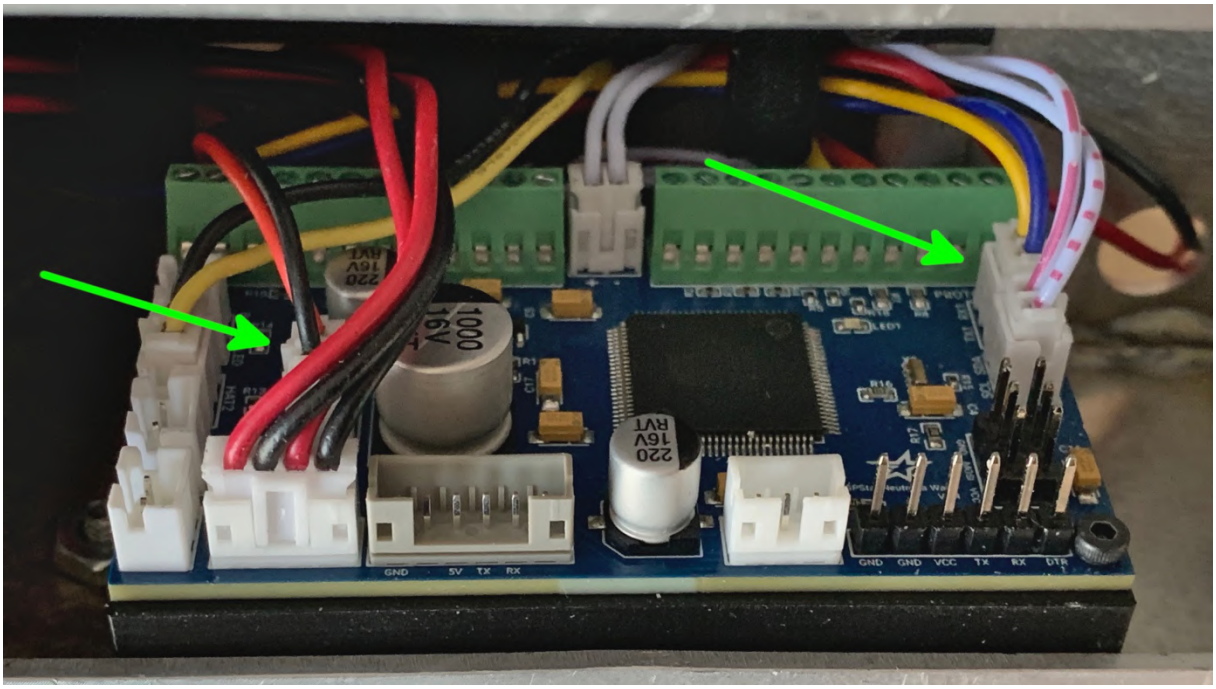


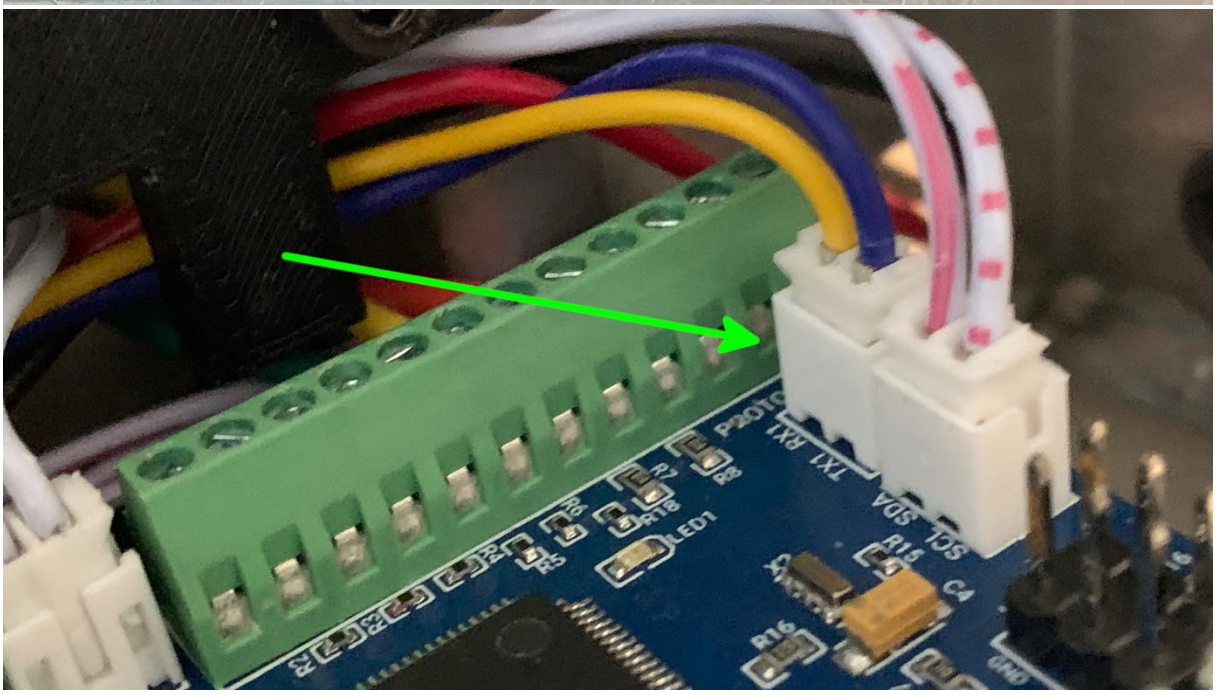
Option #2 : Straight through wires.

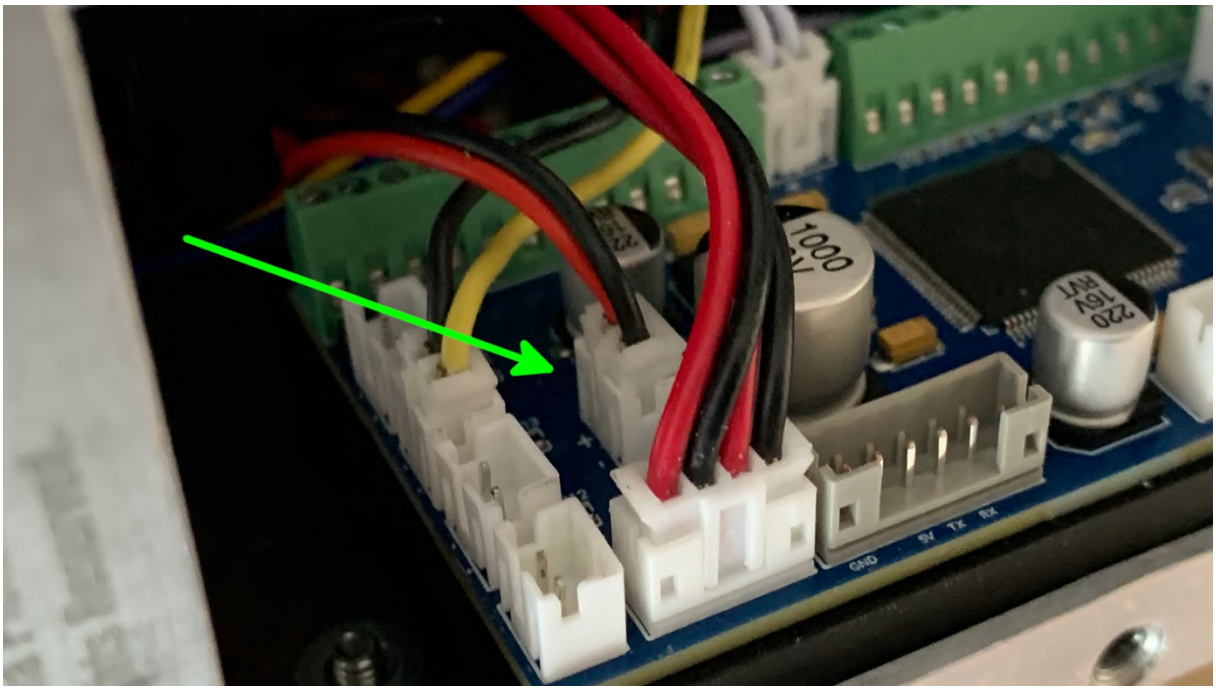
If you are wiring your Neutrona Wand directly to the Proton Pack as per the original films of 1984 and 1989, then feed the smaller connector ends (JST-PH) directly into the Neutrona Wand handle.



With either option 1 or option 2, once the connectors are fed through the handle. Connect the blue/yellow wire to the GPStar Neutrona Wand board TX1/RX1 and the red/black wire to 5V.

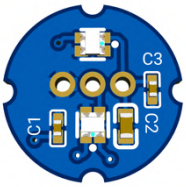





1000
220
16V
GND
5V
TX
RX

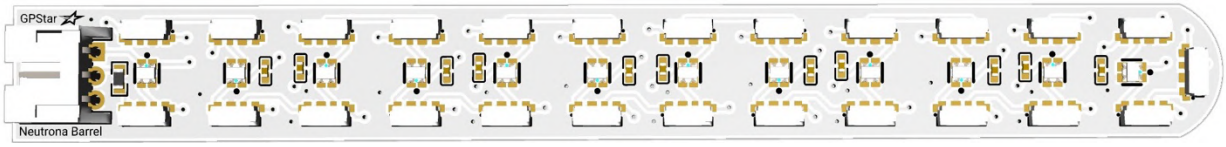
Barrel Lighting :

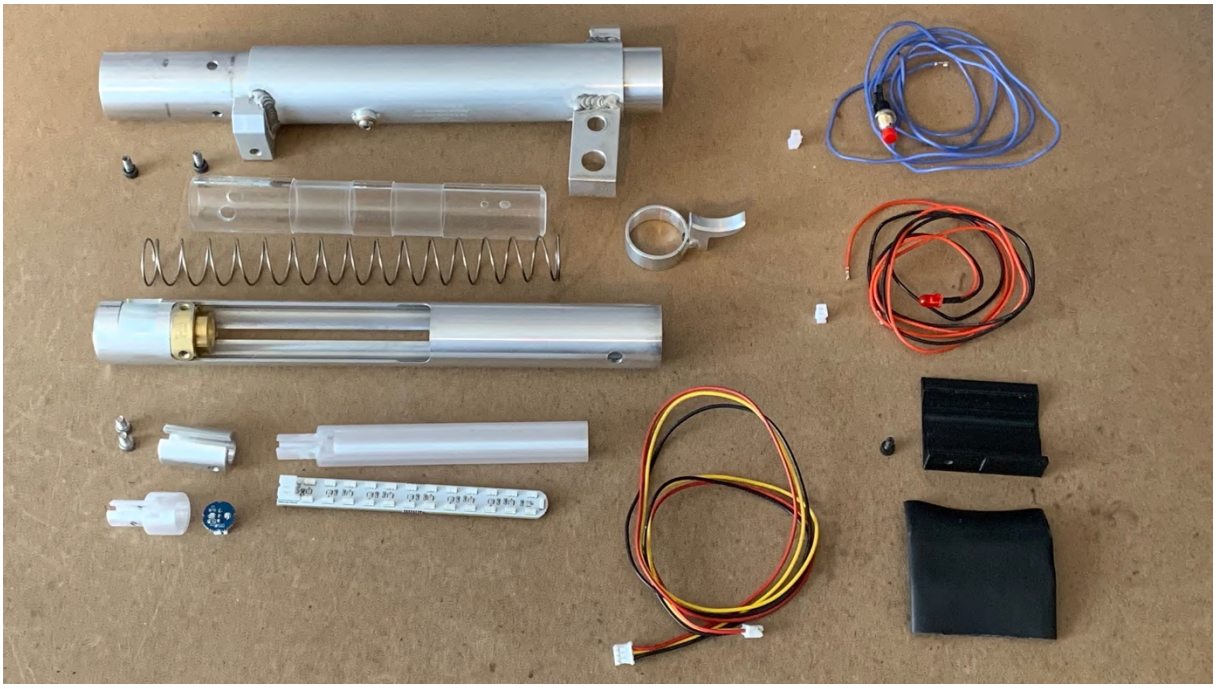
Two choices are available to use with the GPStar setup.



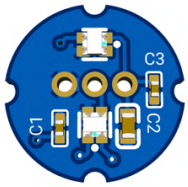
The GPStar Barrel LED mini, which is a colour changing two led board that sits at the back of the emitter tube and hidden to give an empty emitter tube look as per the films.

The GPStar Neutrona Barrel, which is a 50 led board which emits a proton stream within the emitter tube with the 2 leds on the tip flashing white.

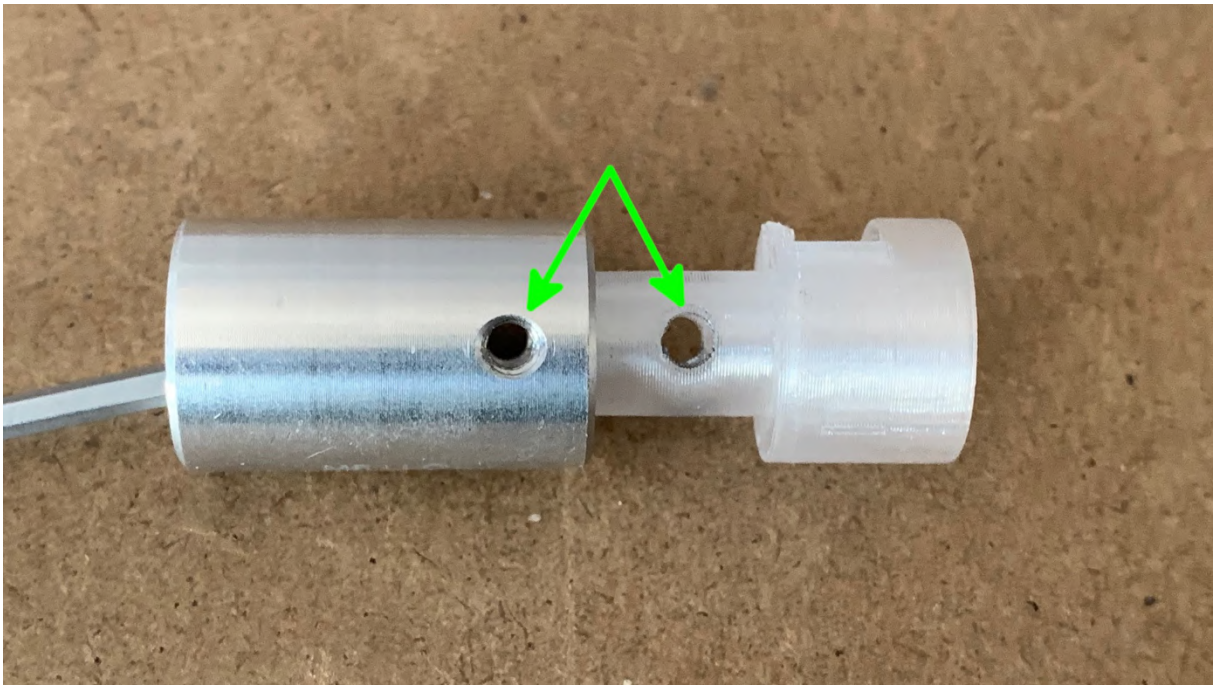


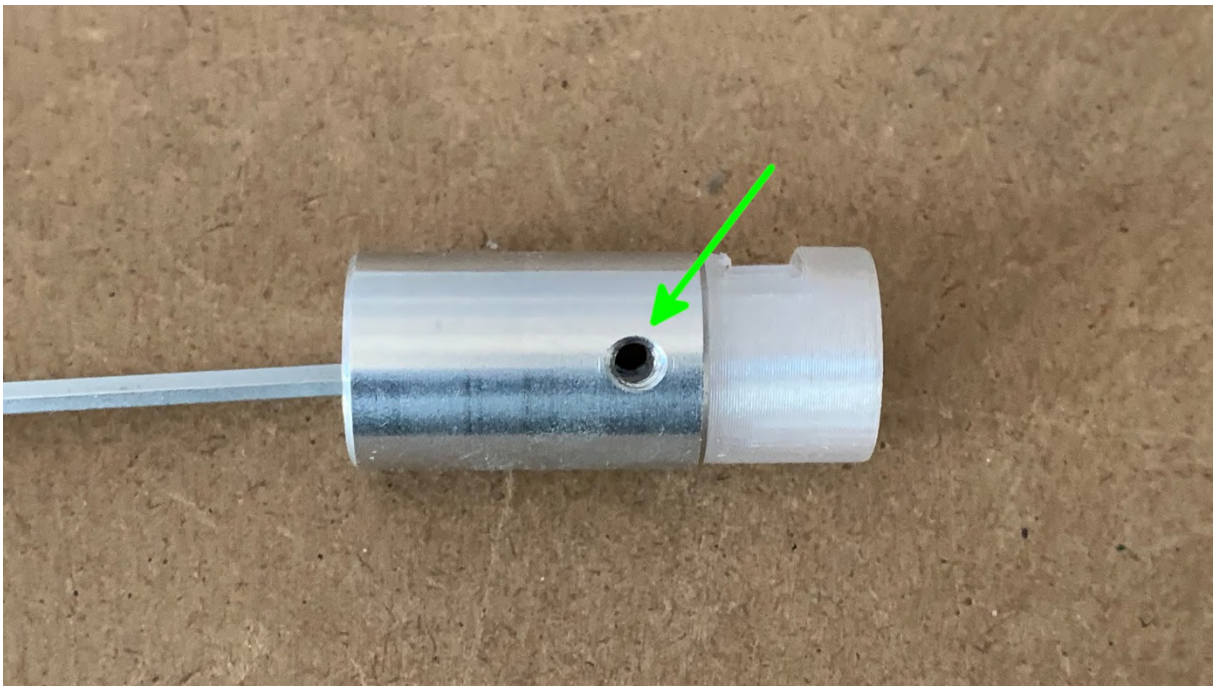


GPStar Barrel LED Mini - Option #1 :

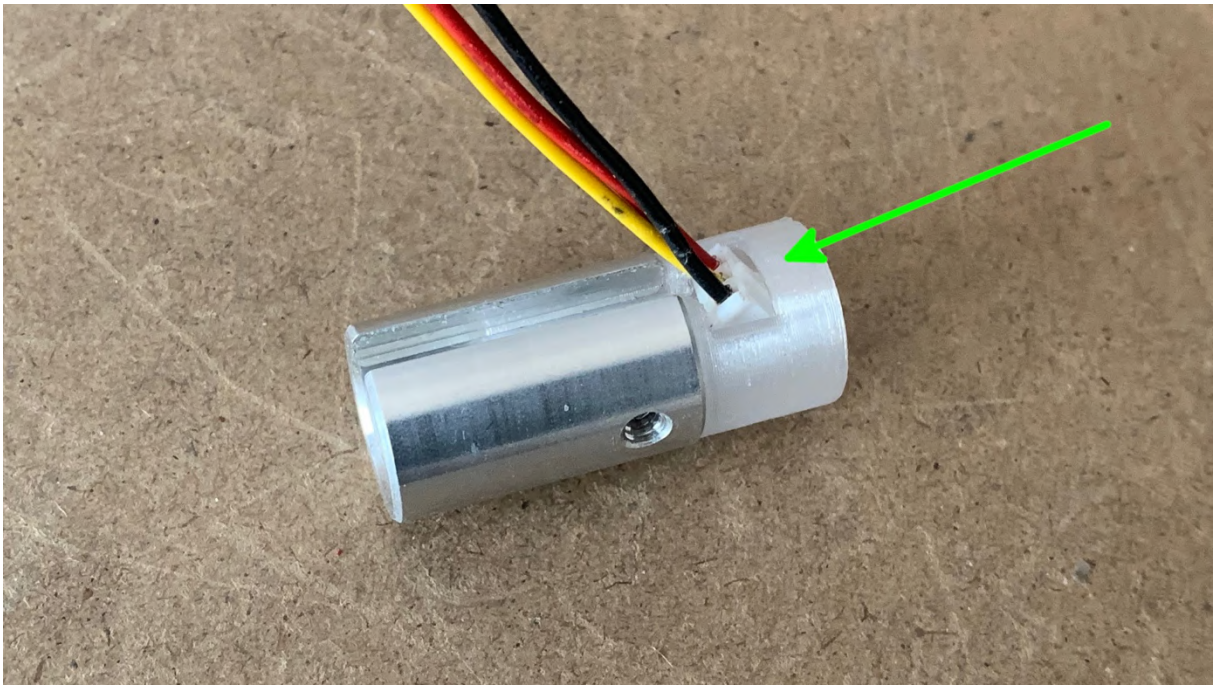


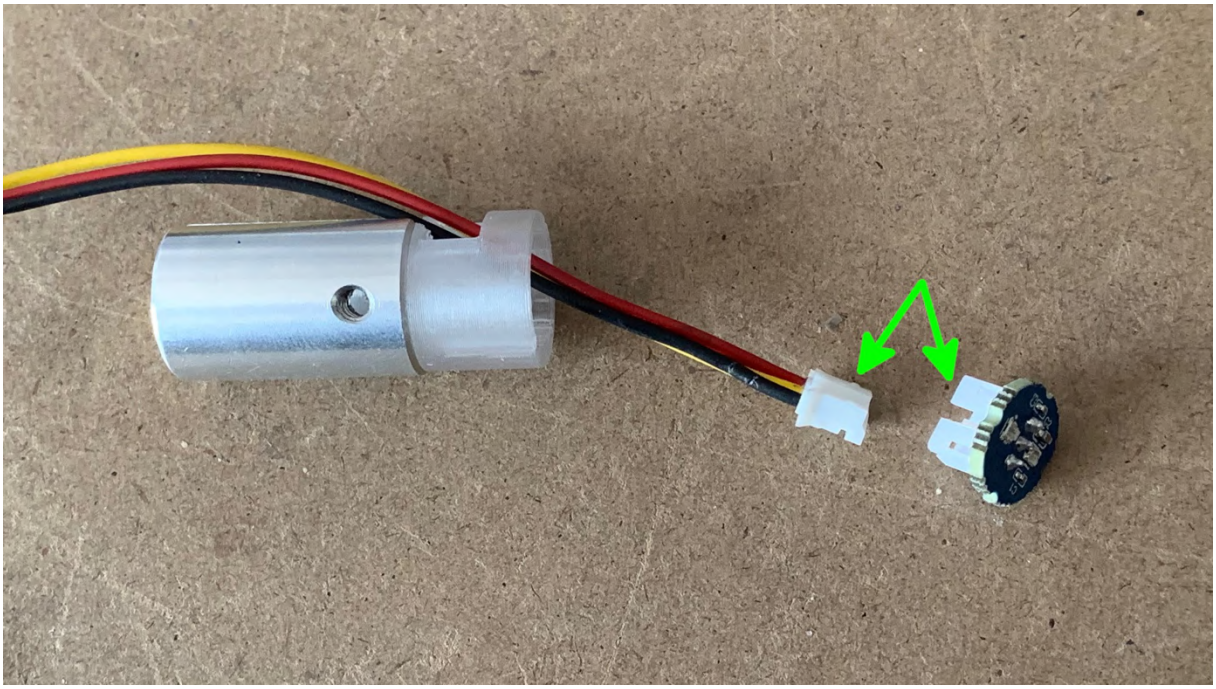
Slide the barrel mount into the Mack's factory barrel collar. Make sure the holes line up on both sides. The mount will fit in very snug.



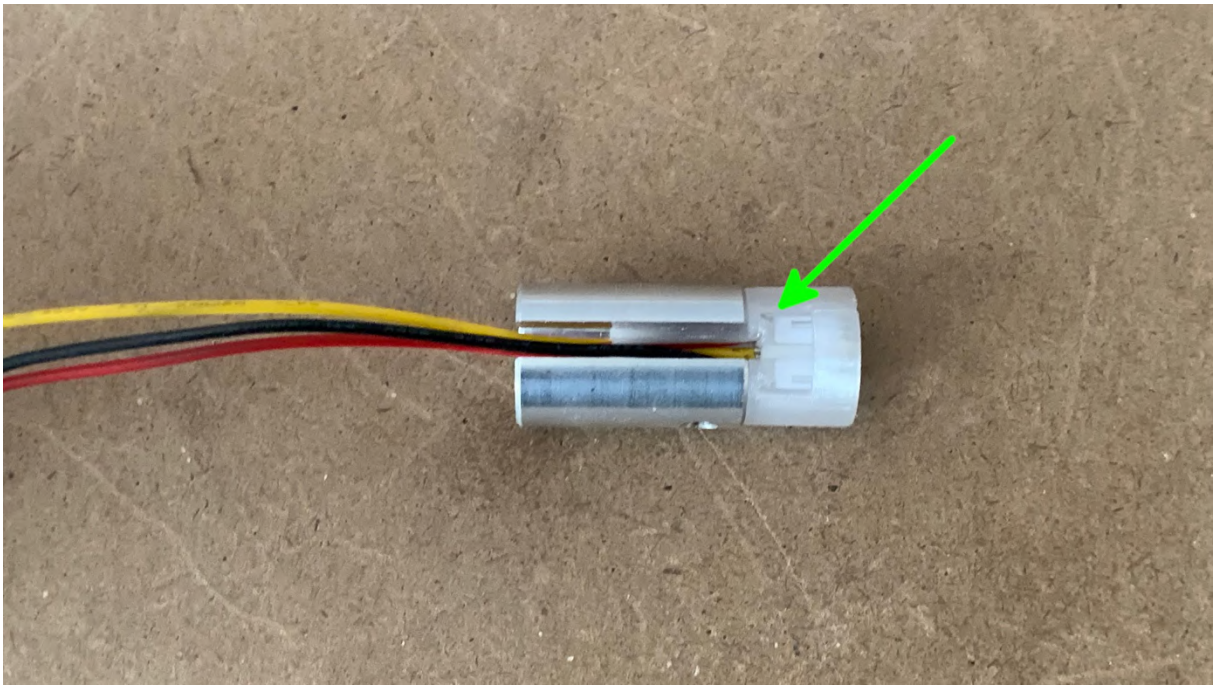


Feed the barrel led wire through the slot on the barrel mount and out the other side. Connect it to the GPStar Barrel LED Mini.

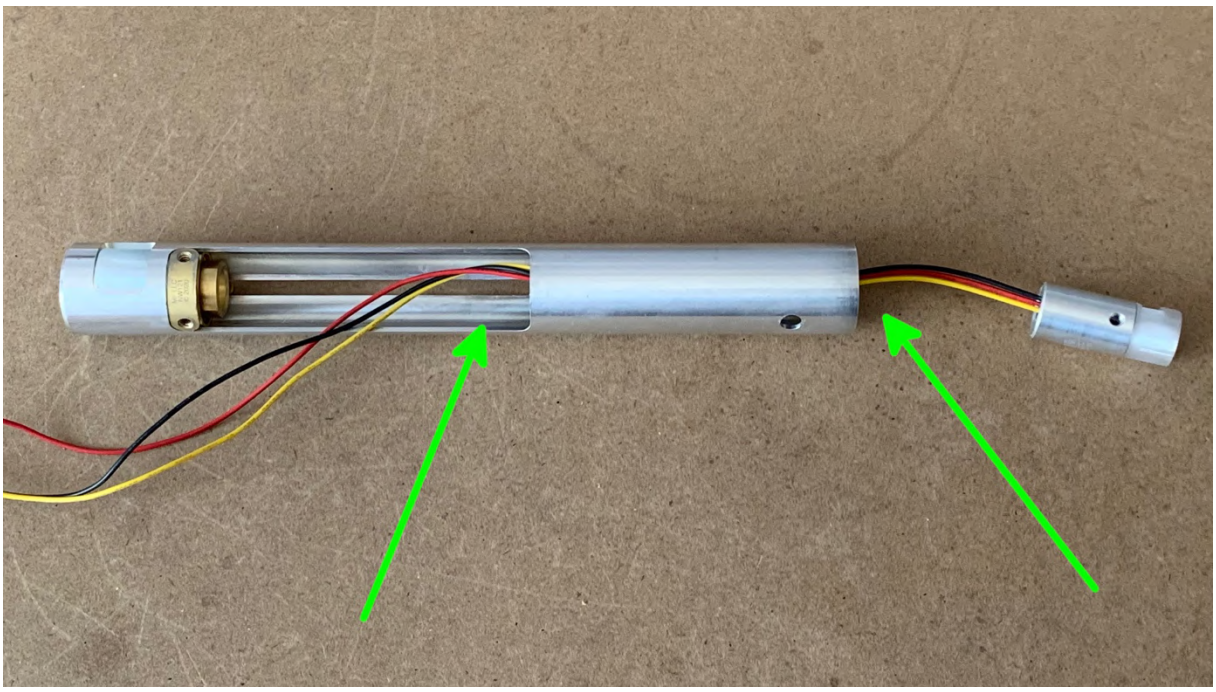




Then push the GPStar Barrel LED Mini into the barrel mount all the way in. The GPStar Barrel LED mini will fit in very snug.

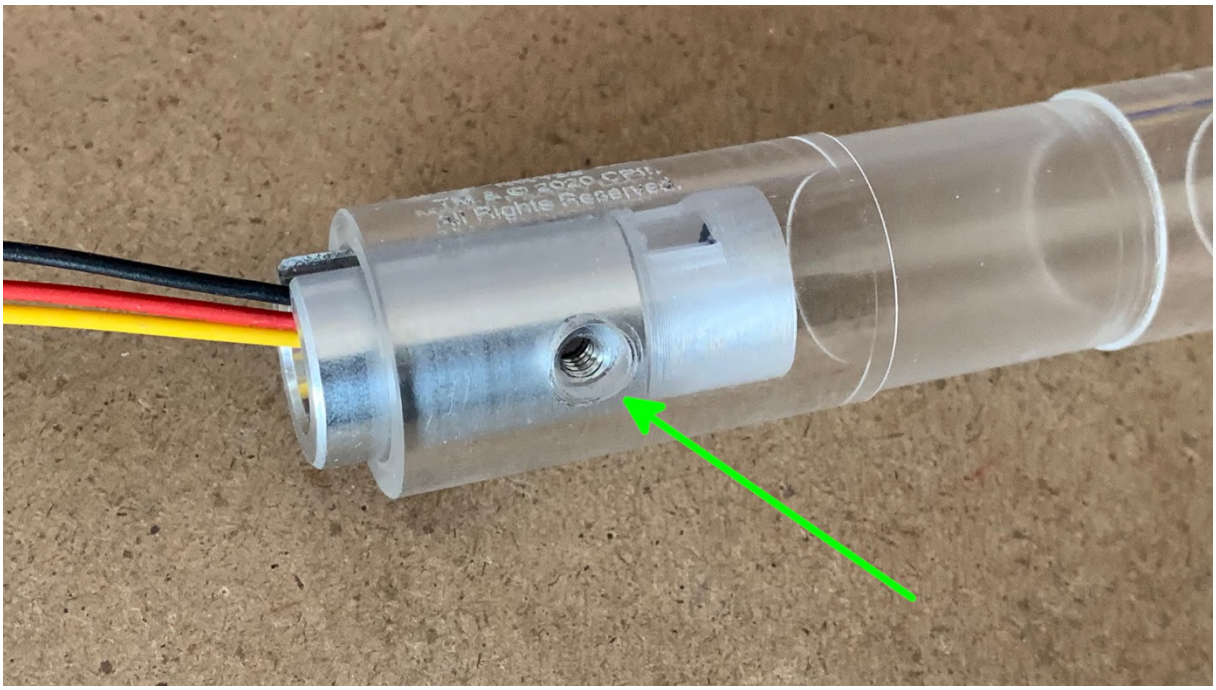


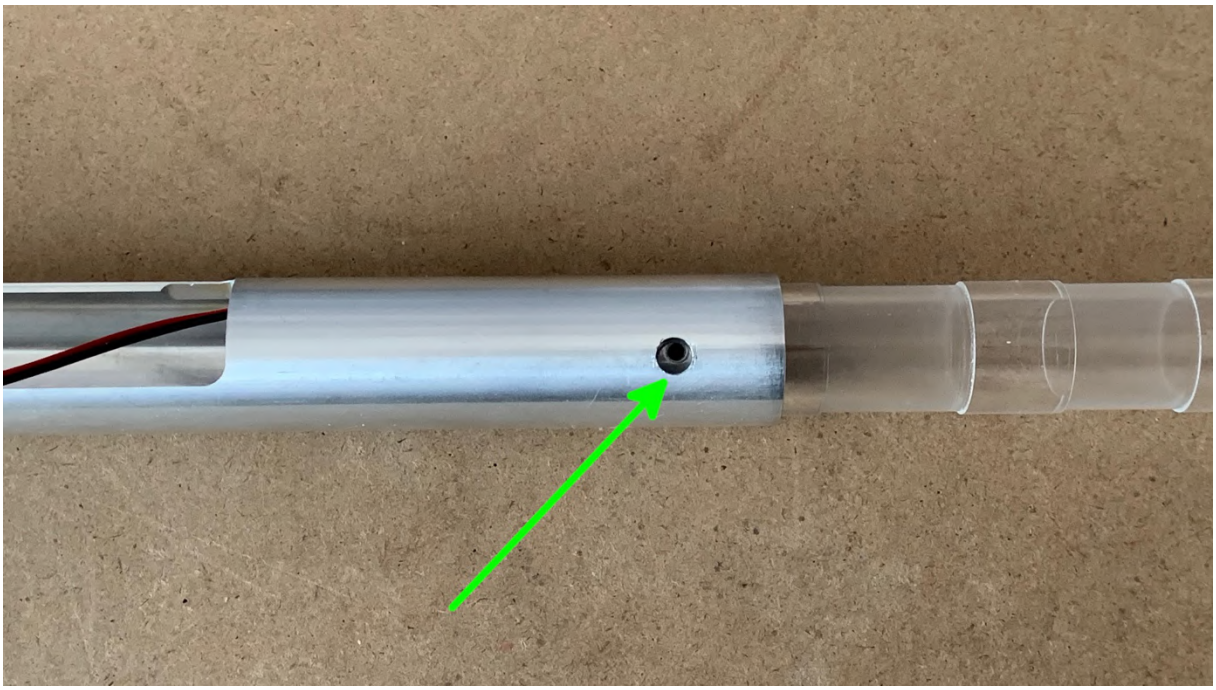
Feed the barrel led wires into the barrel.



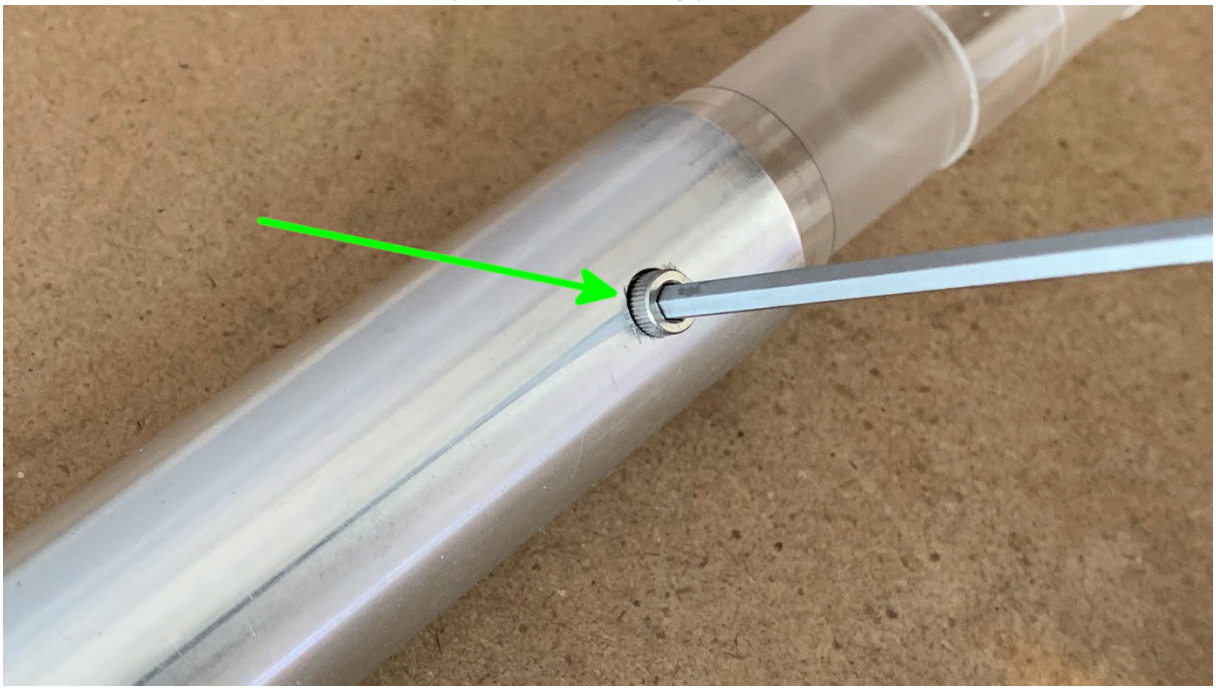
Insert the barrel led assembly into the clear emitter tube, slide the assembly into the barrel with the holes lined up.

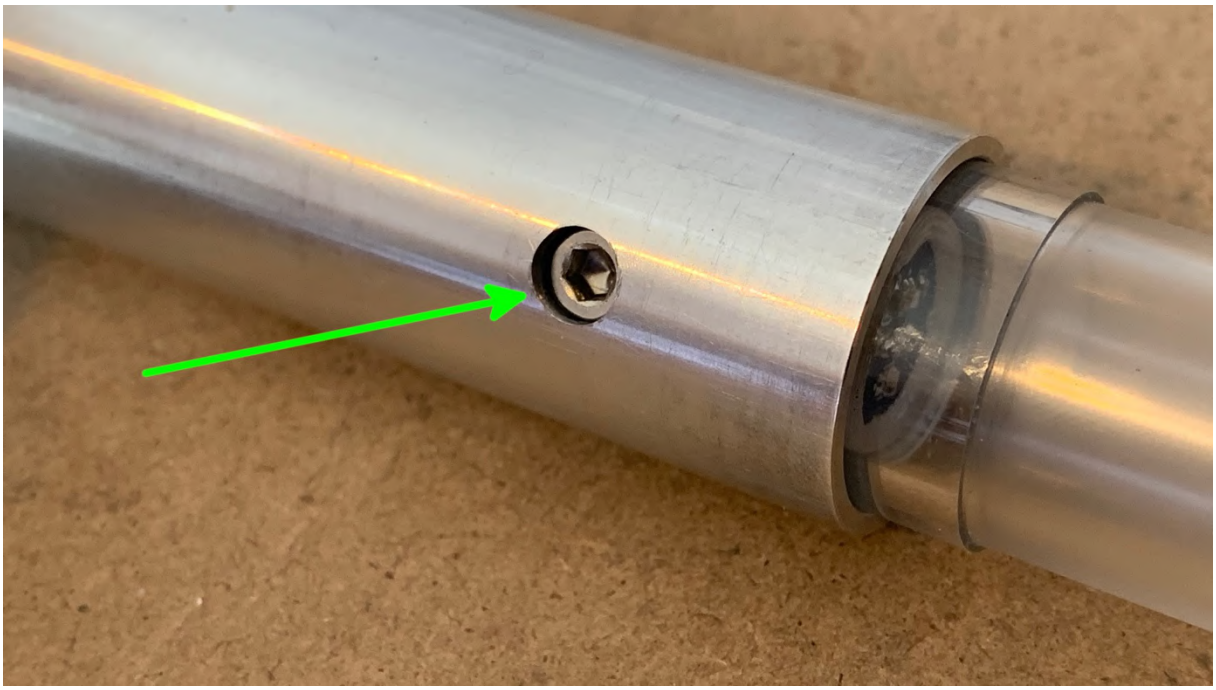
TIP : If you have having trouble aligning everything together, you can push/pull and twist the barrel led wires to help align the assembly.



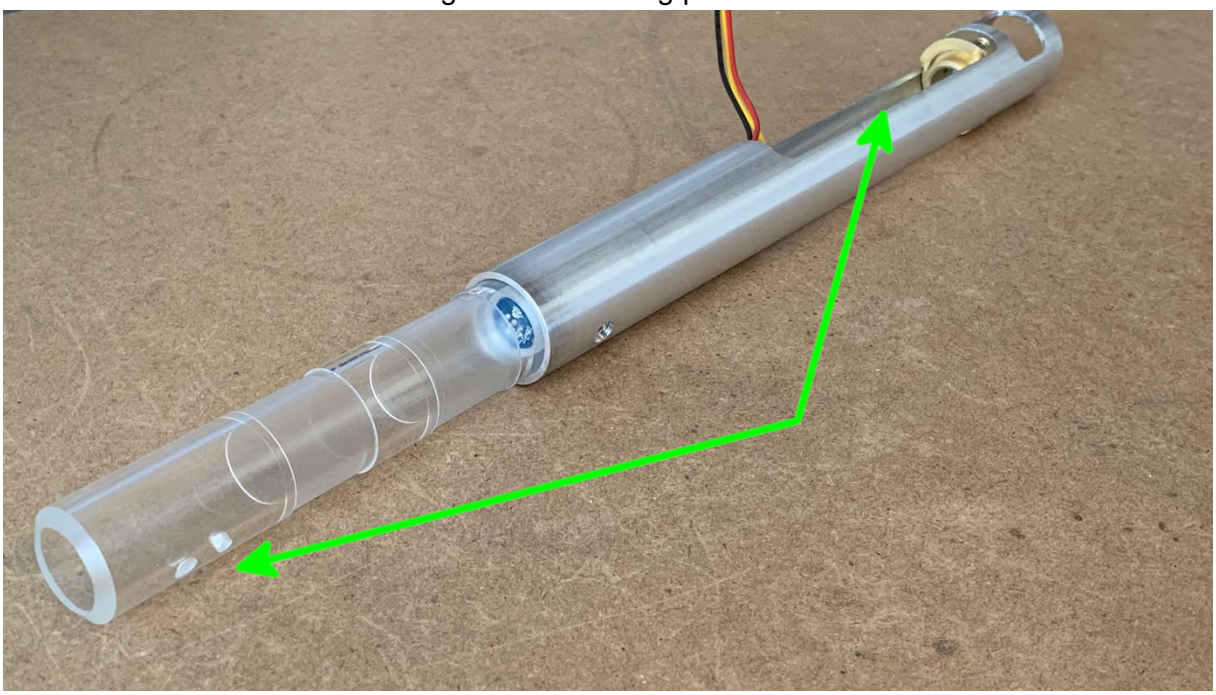


Install the screws into the assembly to secure it snugly.

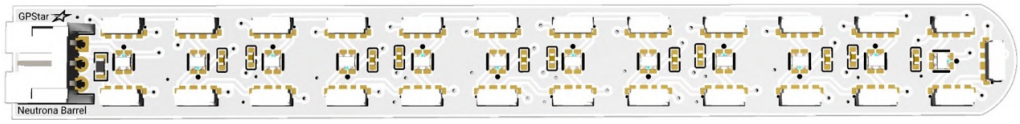




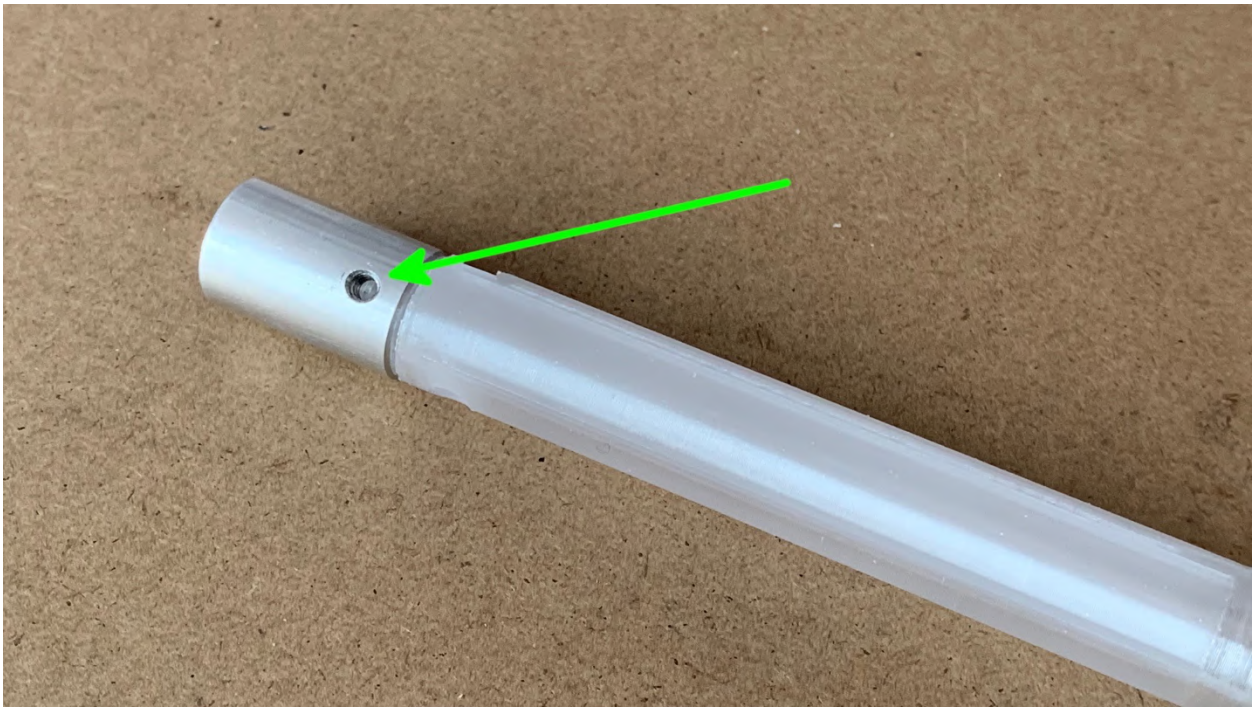
TIP : For proper orientation of the clear emitter tube with the emitter retractor, note the orientation of the tube and markings in the following photo.



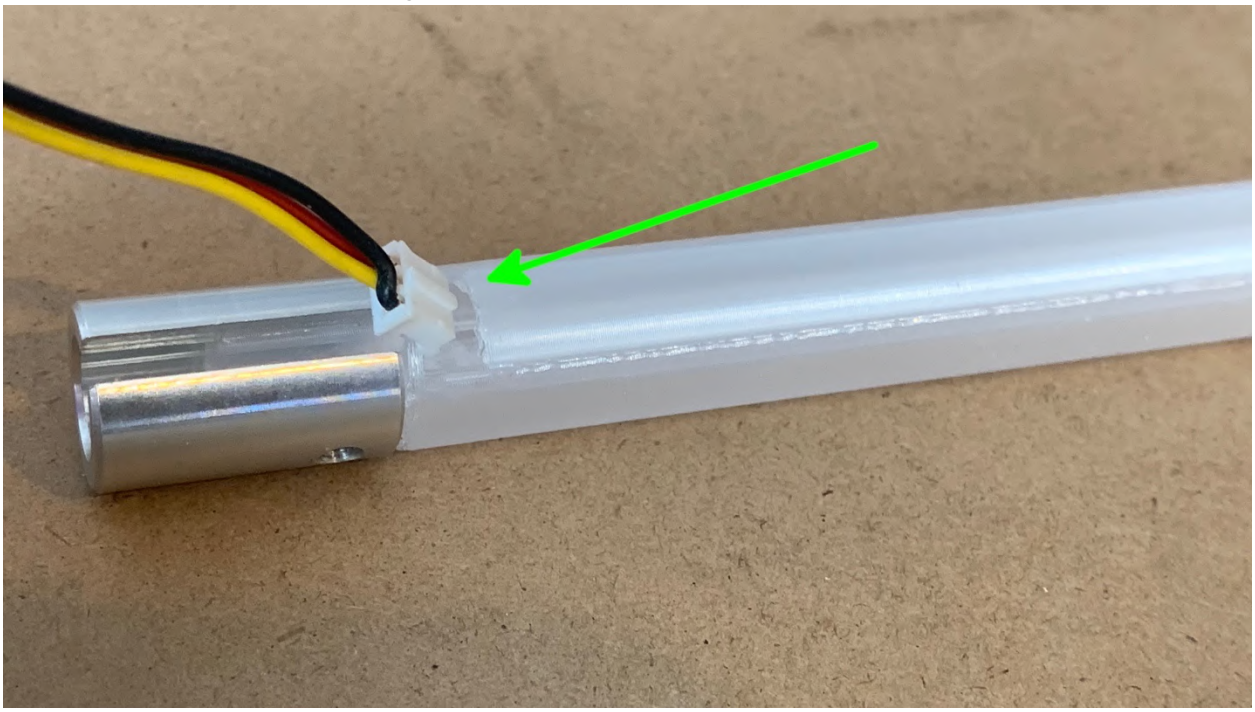
GPStar Neutrona Barrel - Option #2 :



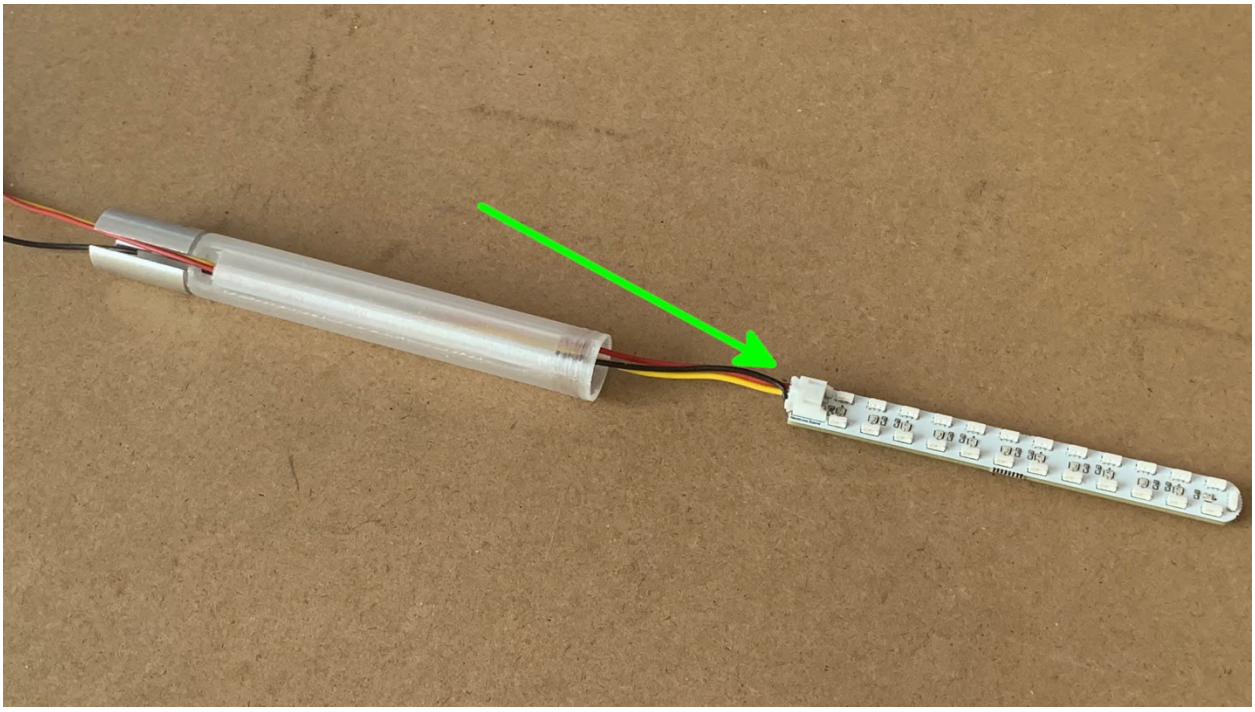
Slide the barrel mount into the Mack's factory barrel collar. Make sure the holes line up.

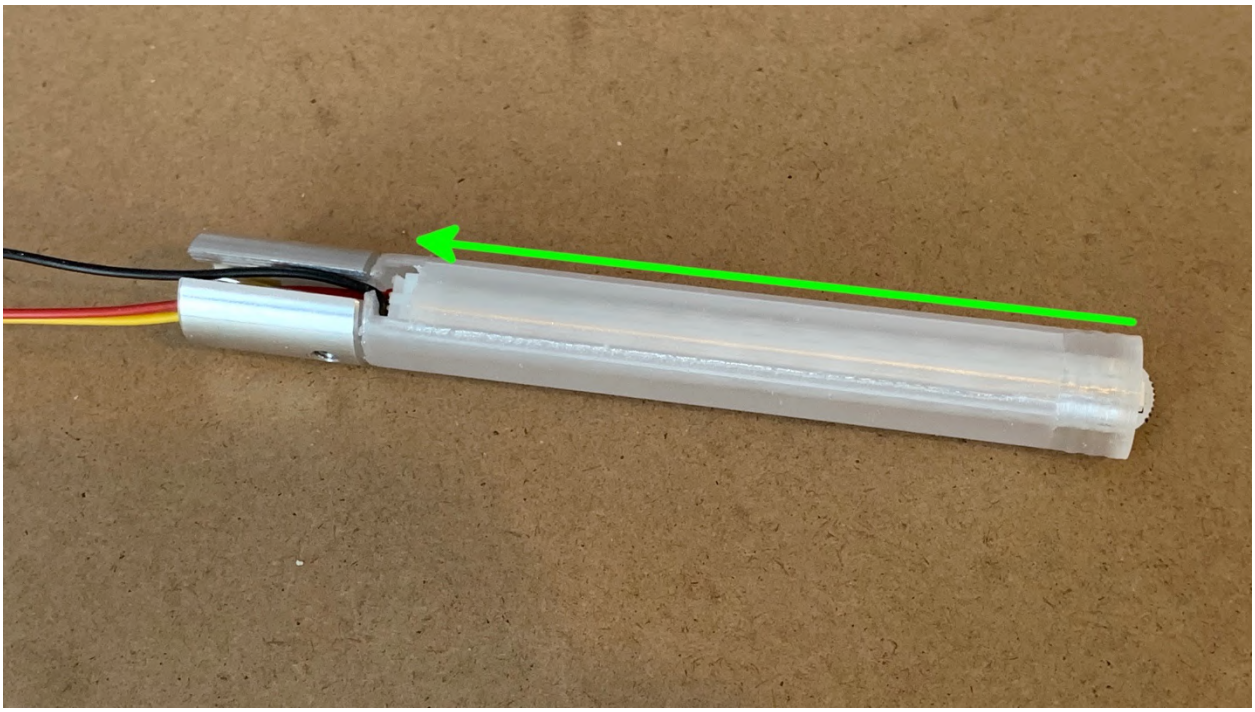


Feed the barrel led wires through the slot on the barrel mount and out the other side.

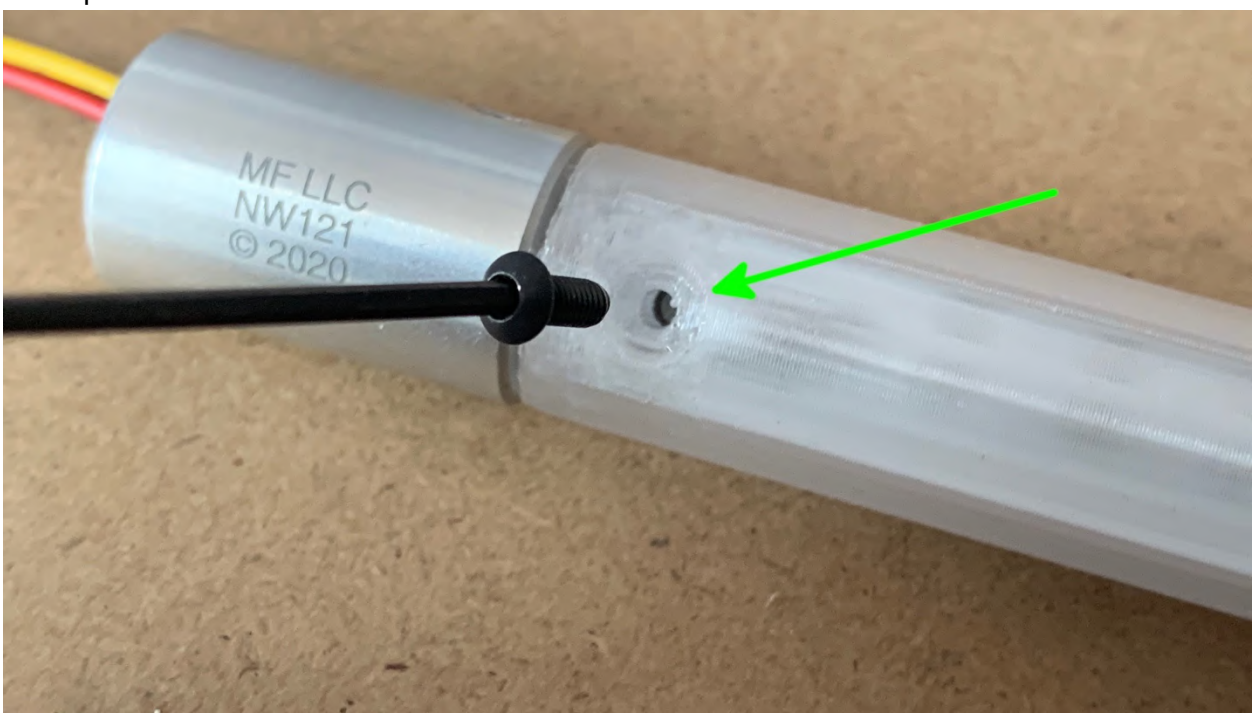


Connect the cable to the GPStar Neutrona Barrel. Then push the GPStar Neutrona Barrel all the way into the barrel mount.

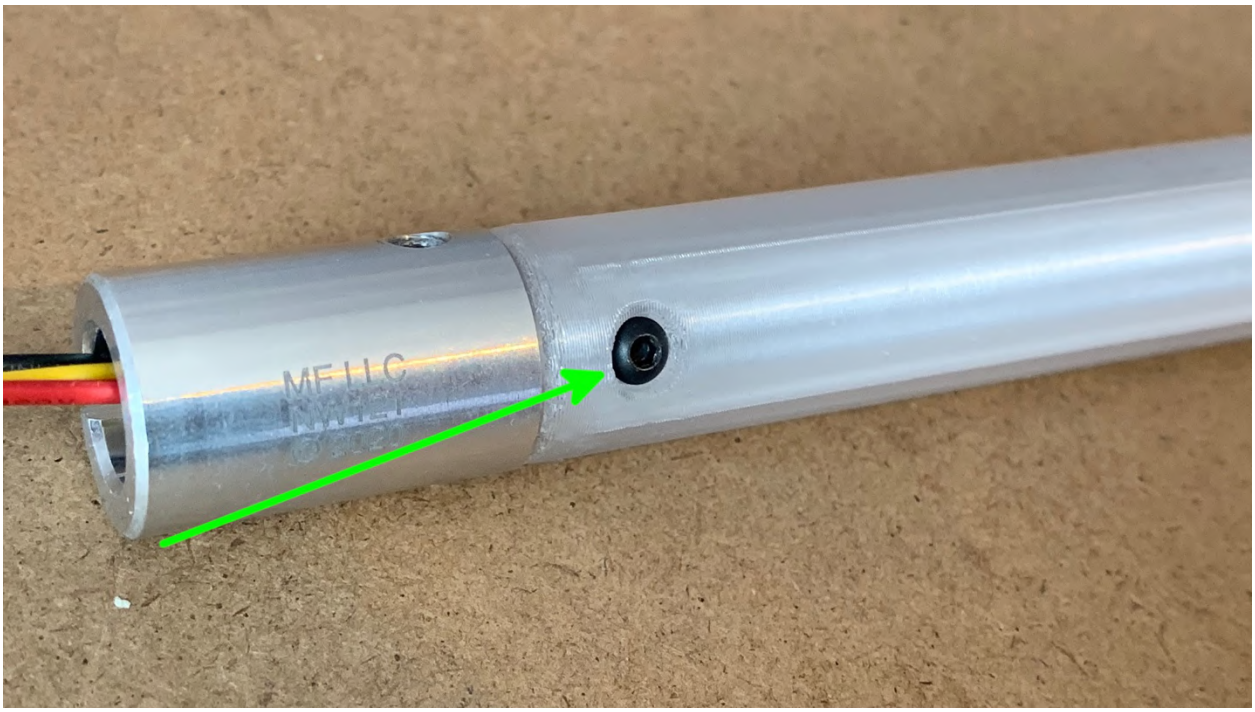




Line up the hole on the underside of the mount to the hole on the GPStar Neutrona Barrel.



Use the included m2.5x6 screw to secure the GPStar Neutrona Barrel to the mount.

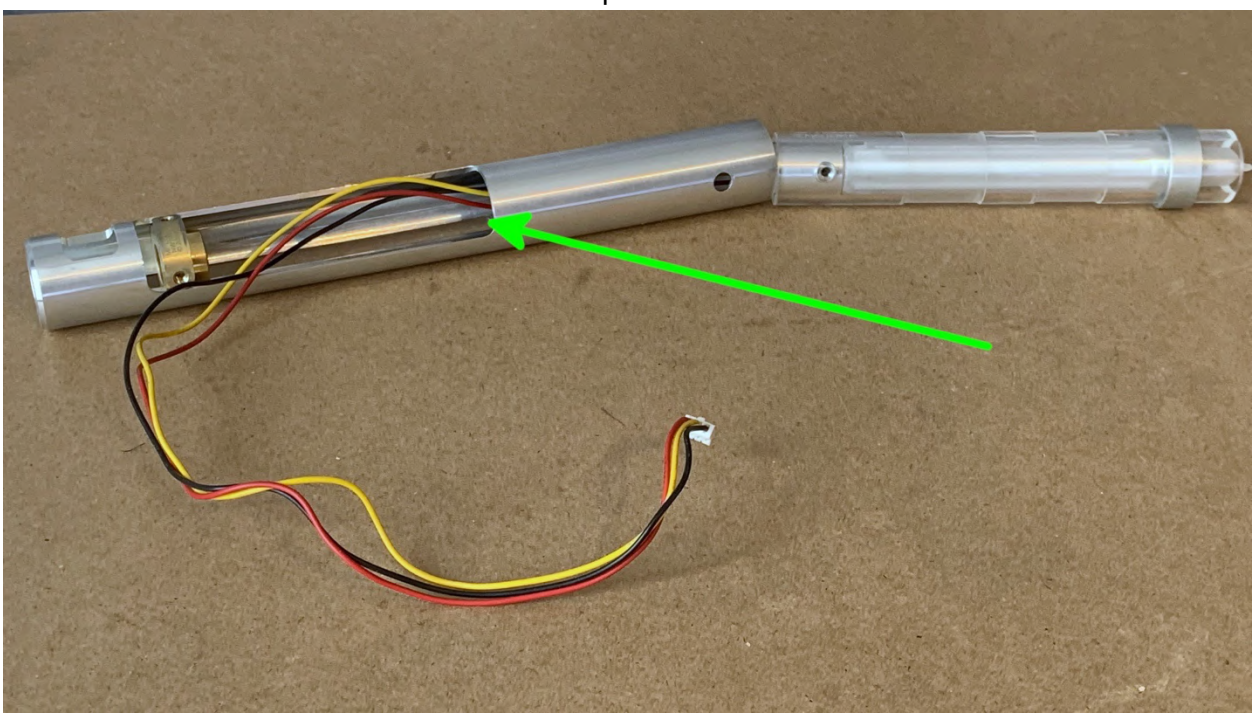


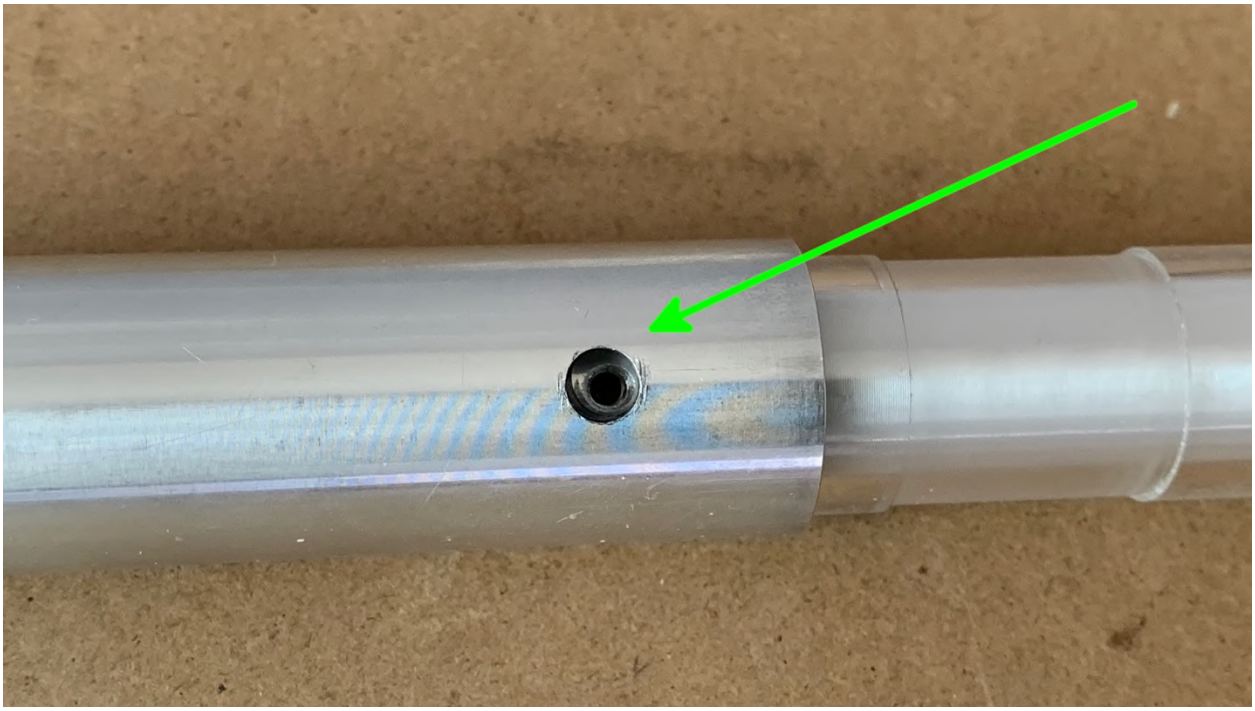
Optionally, insert and thread in the barrel tip into the GPStar Neutrona Barrel mount.

Slide the assembled mount into the clear tube, and line up the holes.

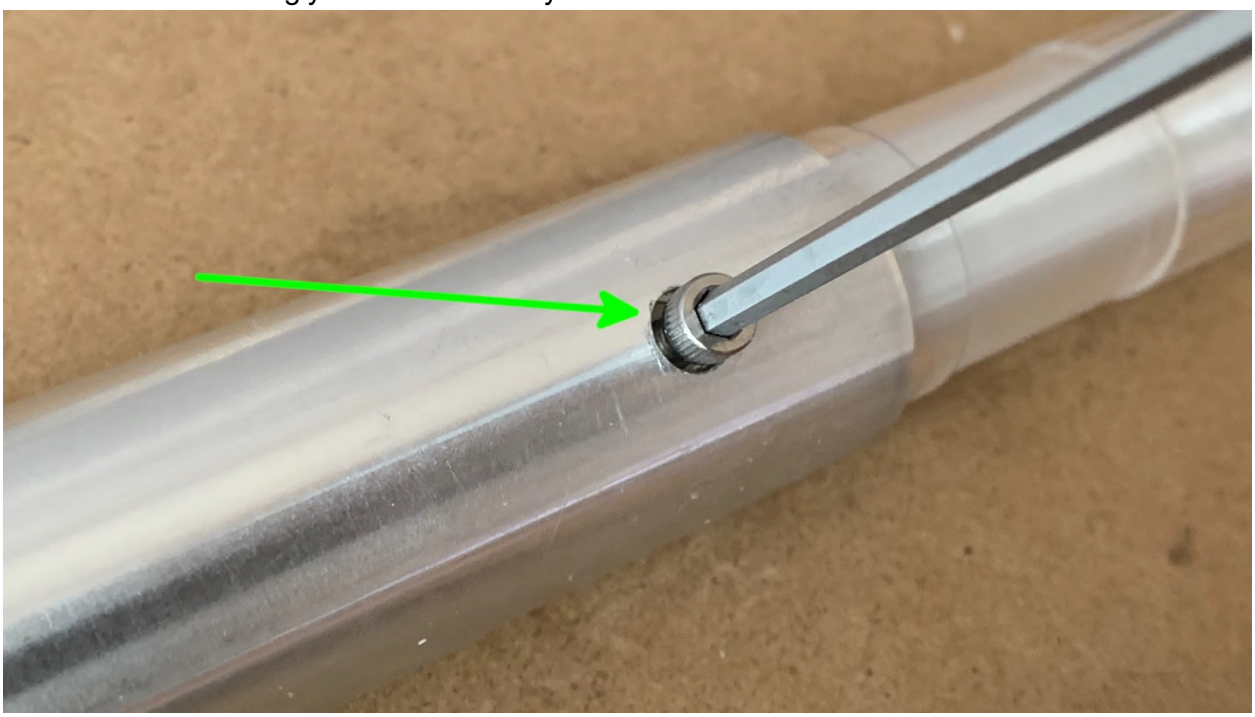
TIP: Note the proper orientation of the mount in the tube in the photo.

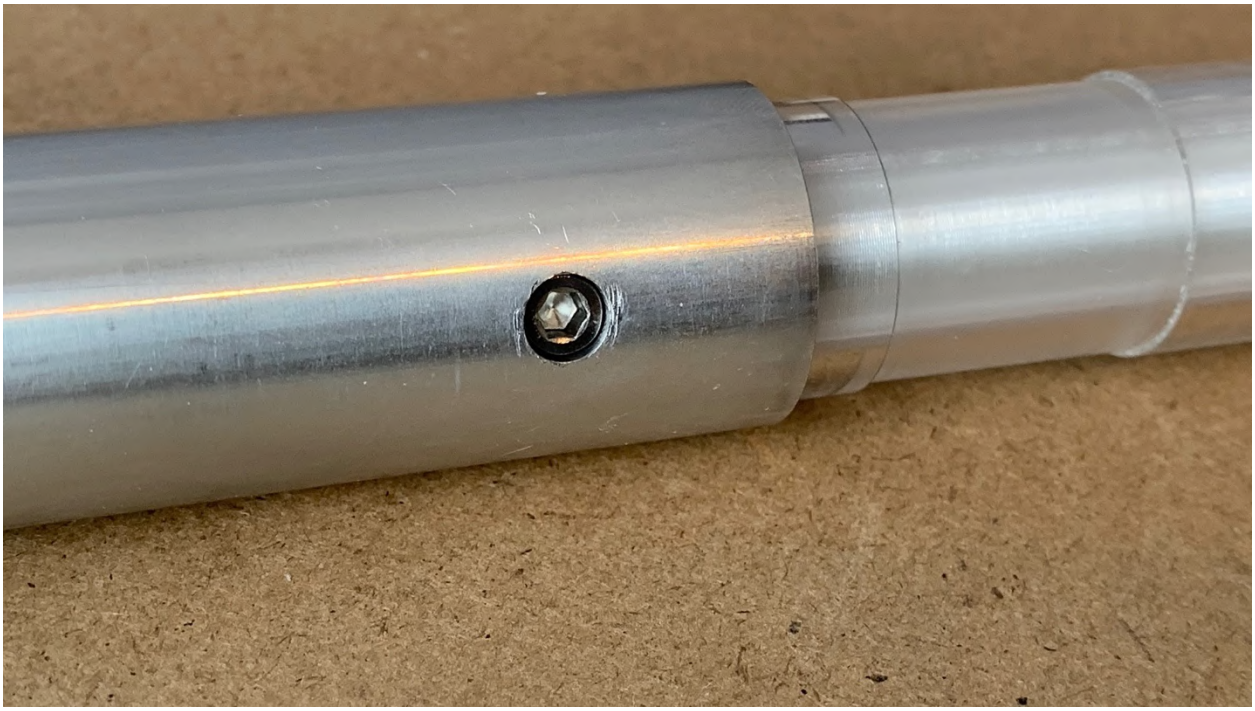
Feed the barrel wires into the barrel and line up the holes on both sides.





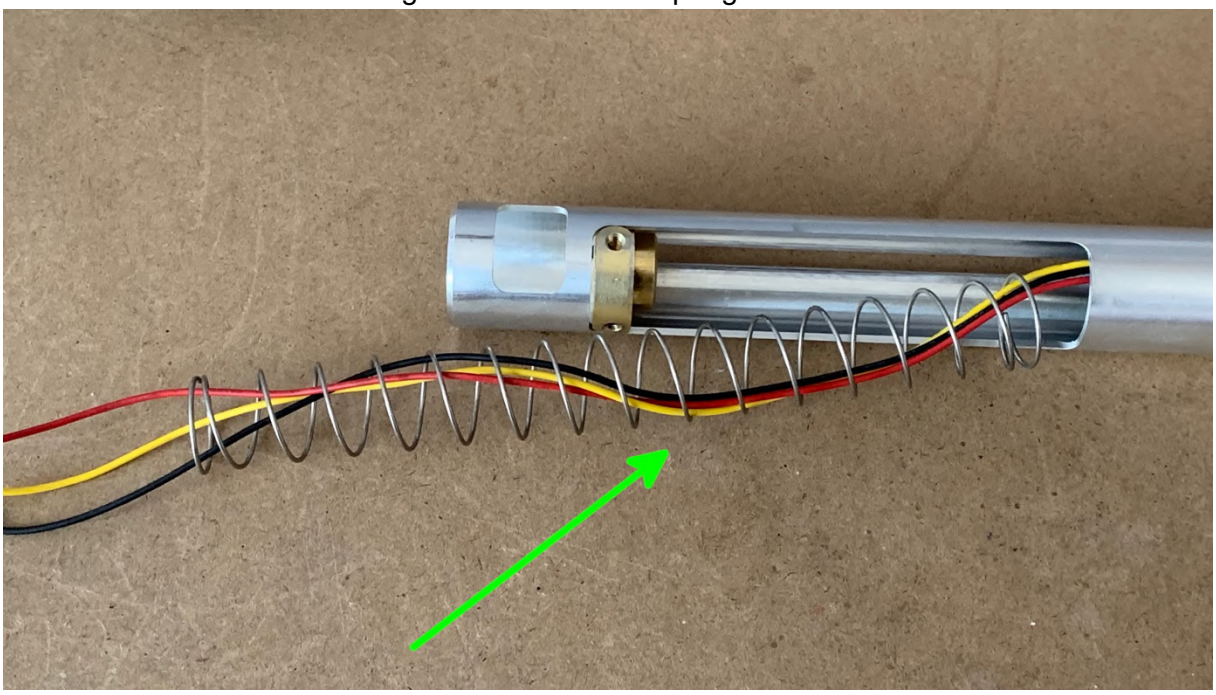
Install the screws snugly into the assembly to secure it.



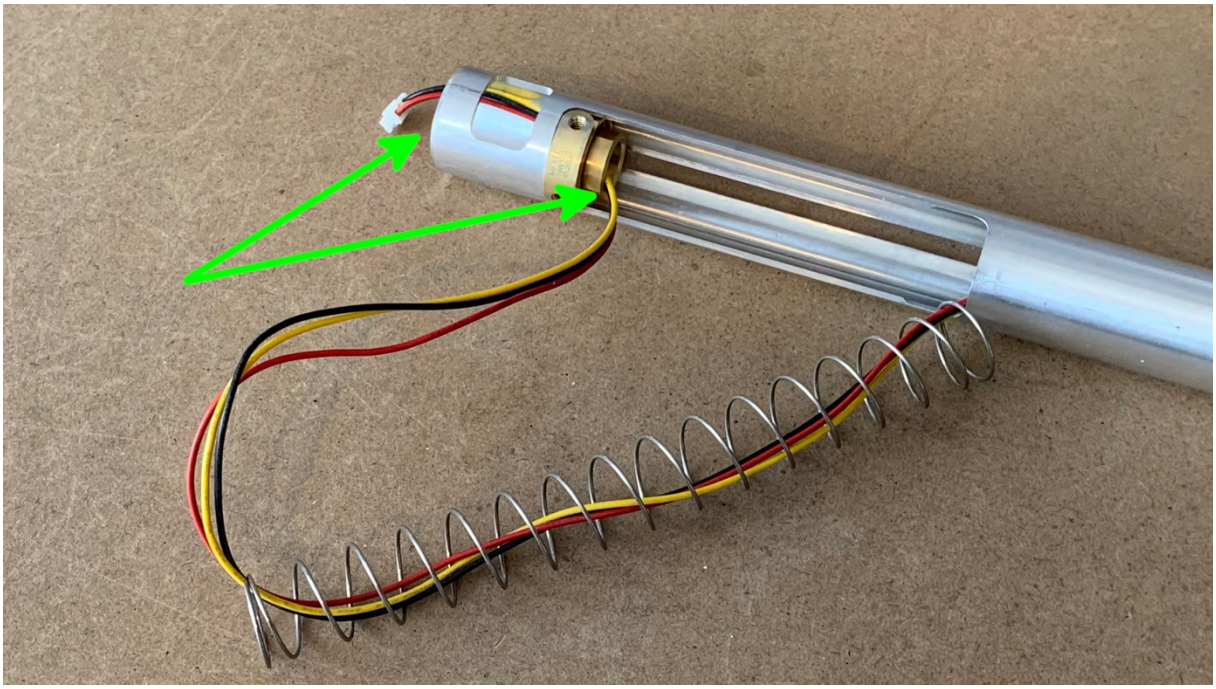


Continuation of the install for either the GPStar Barrel LED Mini & GPStar Neutrona Barrel:

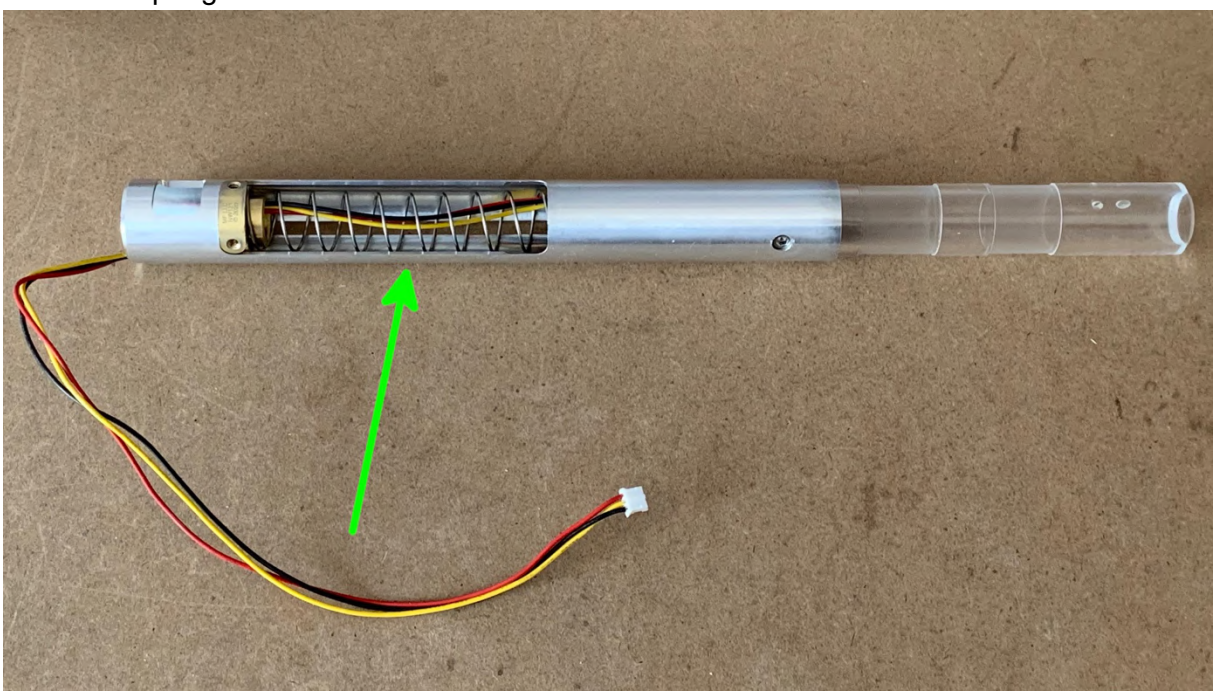
Feed the barrel led wires through the inside of the spring.



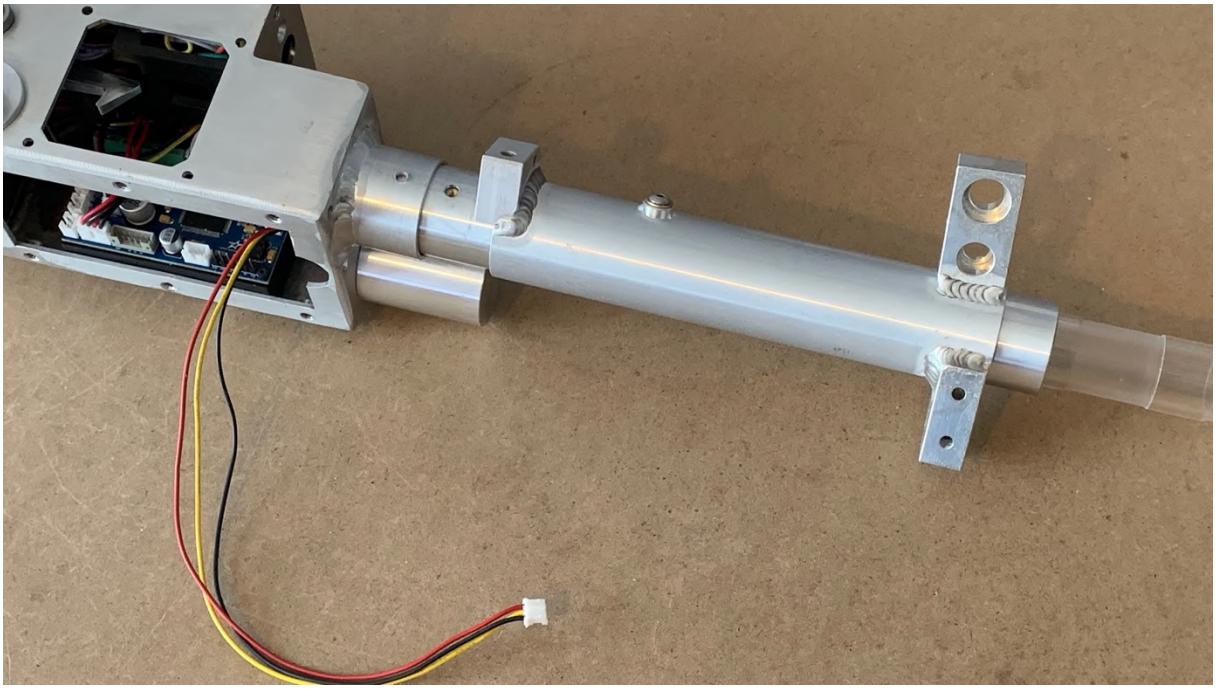
Run the barrel led wires through the brass collar and out the back of the barrel assembly.

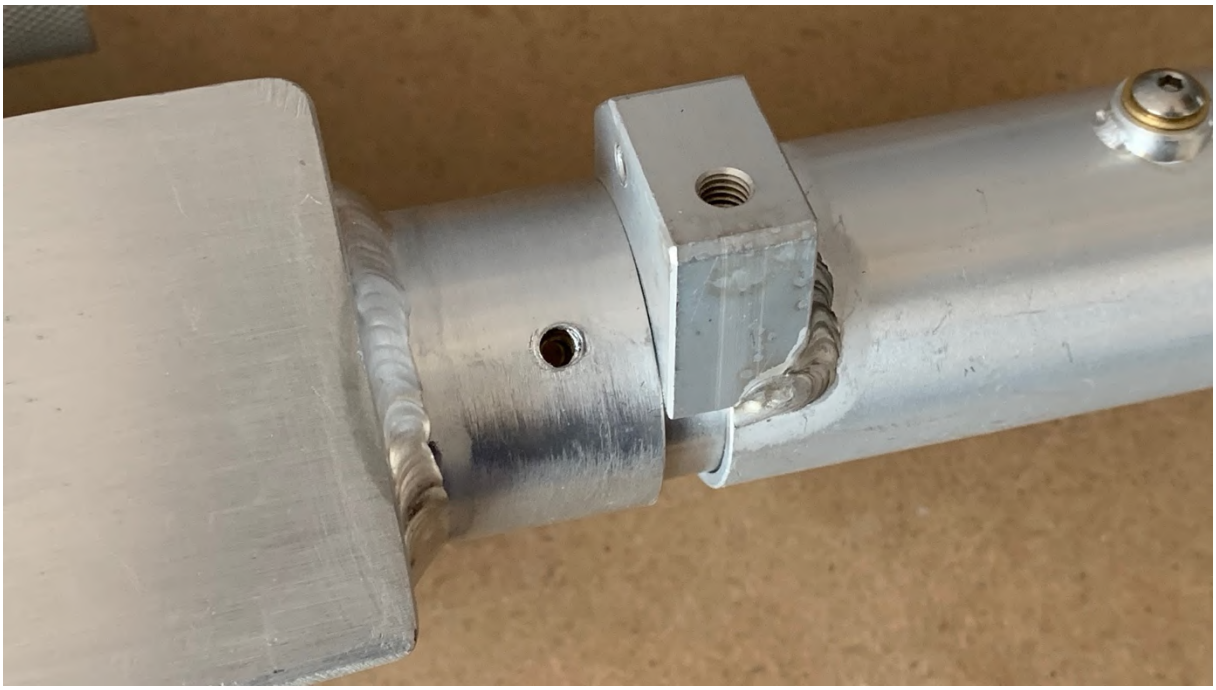


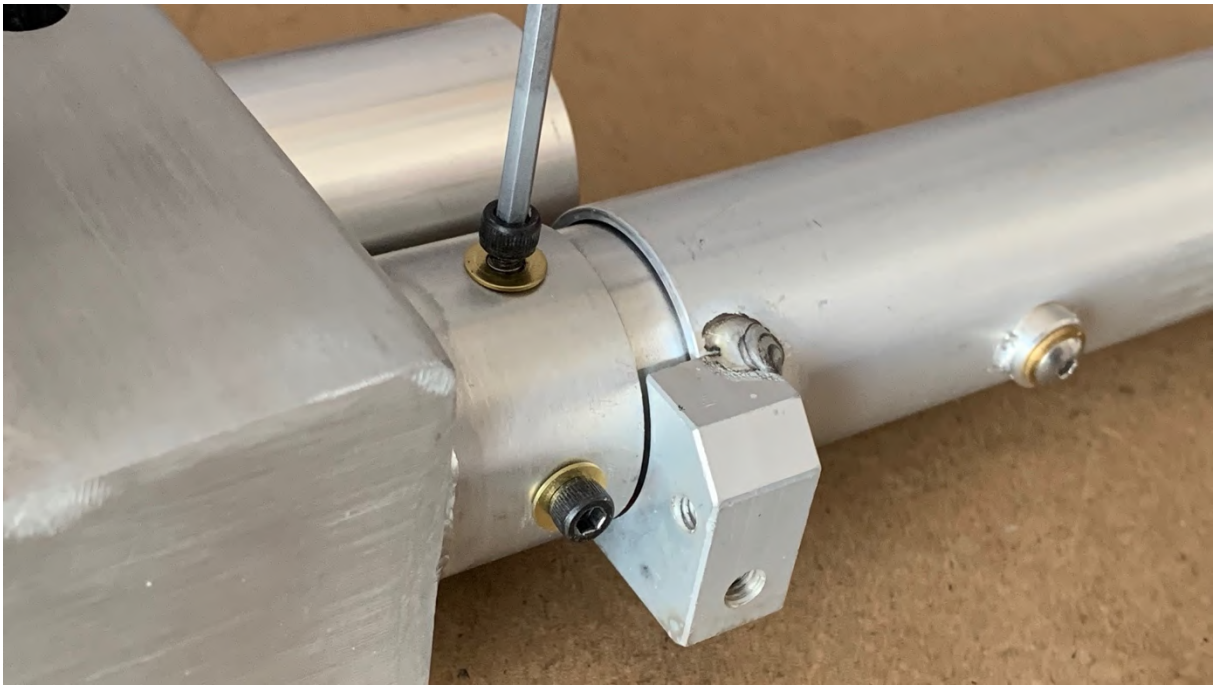
Install the spring into the barrel.



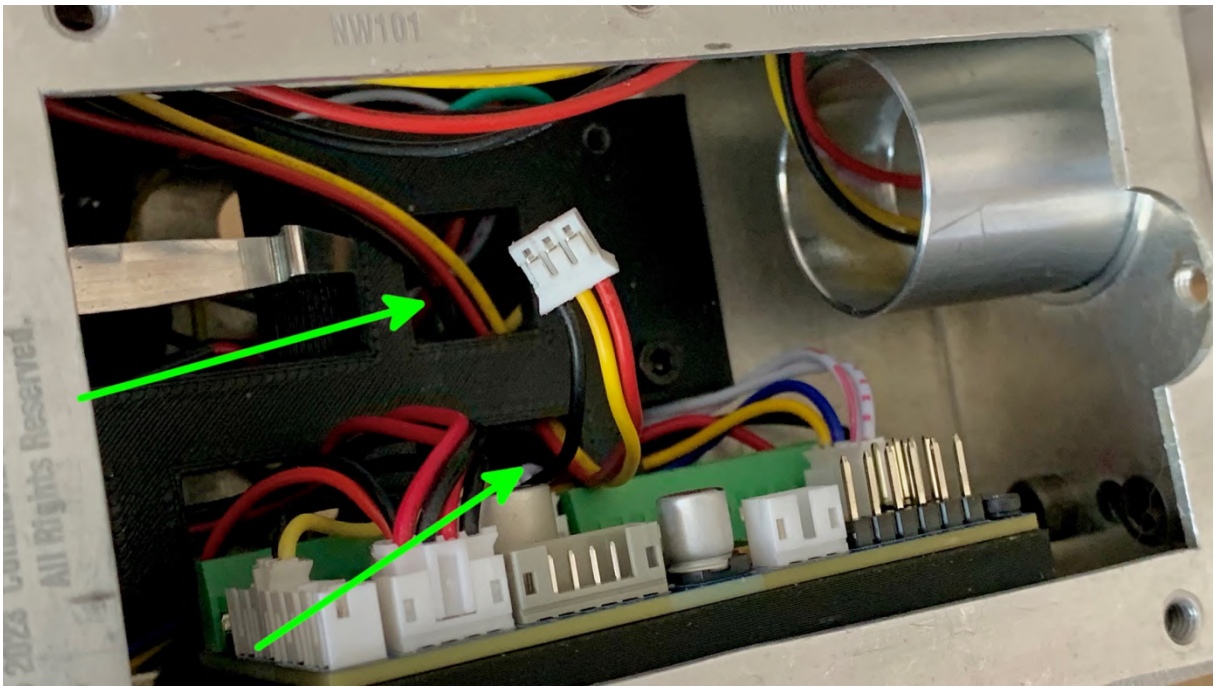
Install the barrel assembly to the Neutrona Wand body as per the instructions from Mack's Factory.

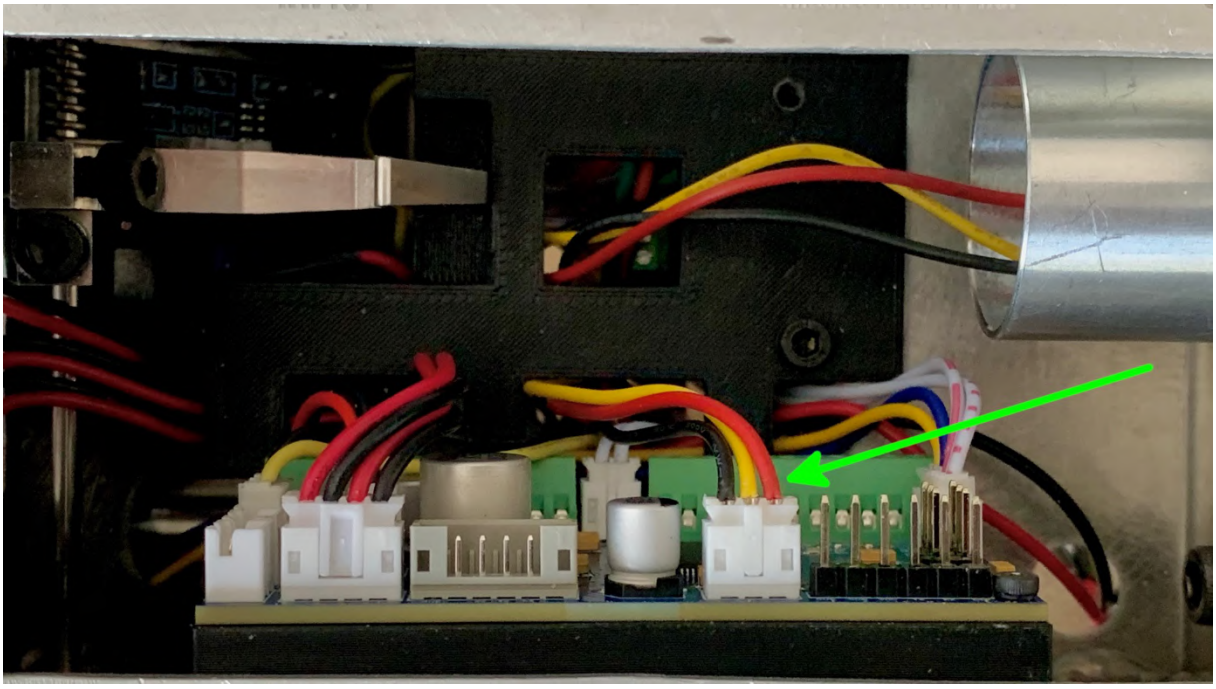




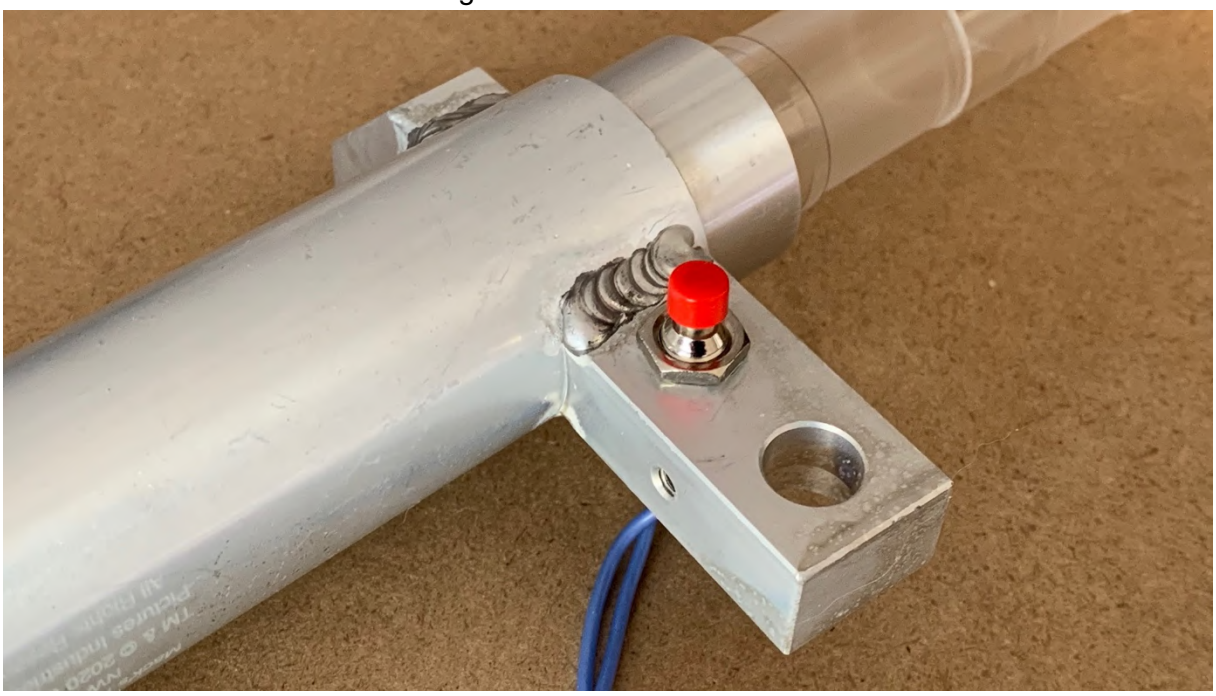


Run the barrel led wires through the square hole in the wire cover and under and back up on the other side. Plug it into the GPStar Neutrona Wand board and then tuck the excess wires under the wire cover.

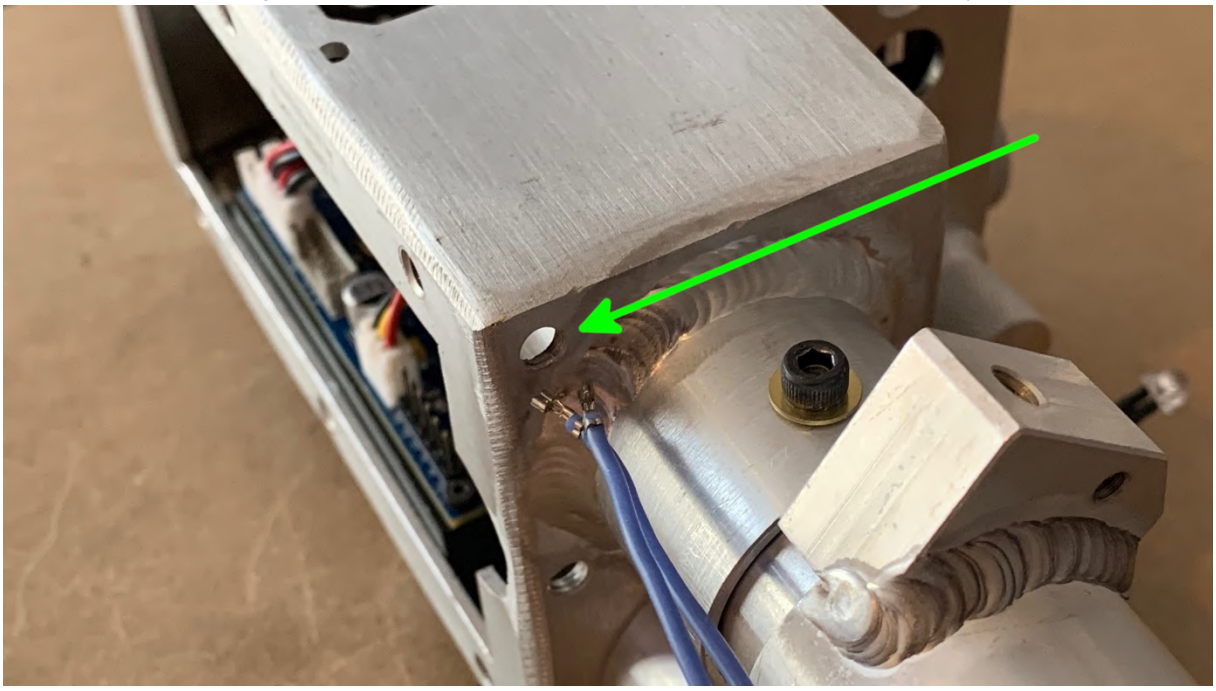


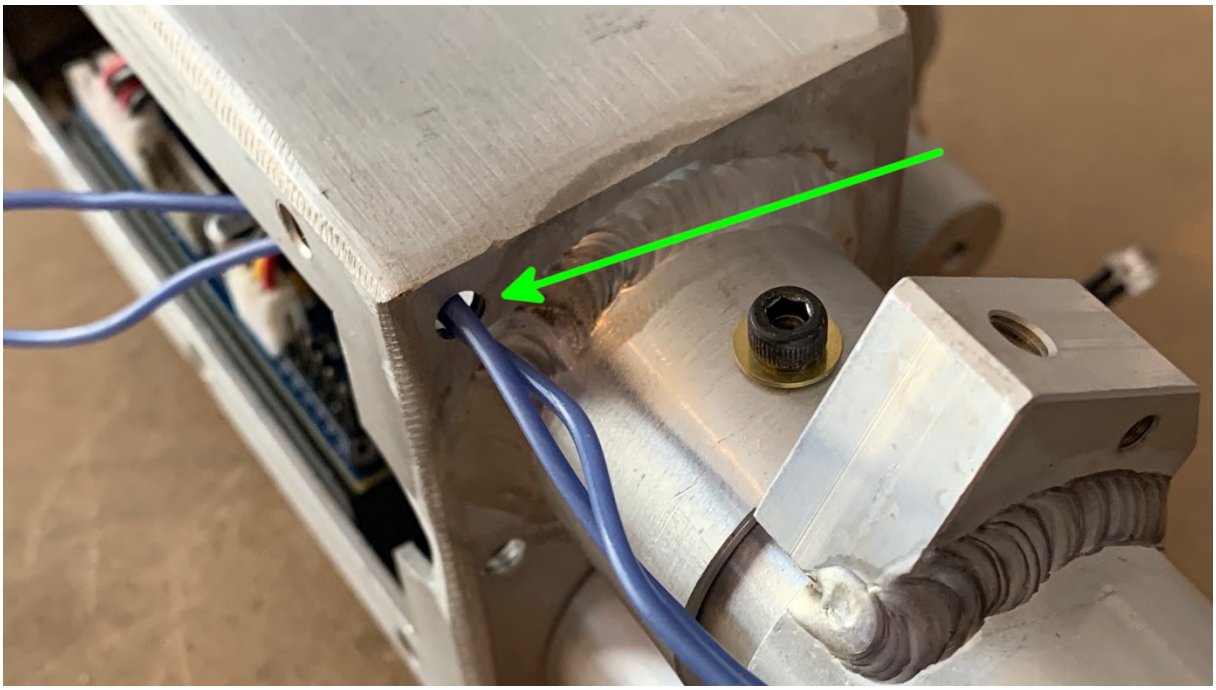


Install the barrel switch into the wing of the barrel.

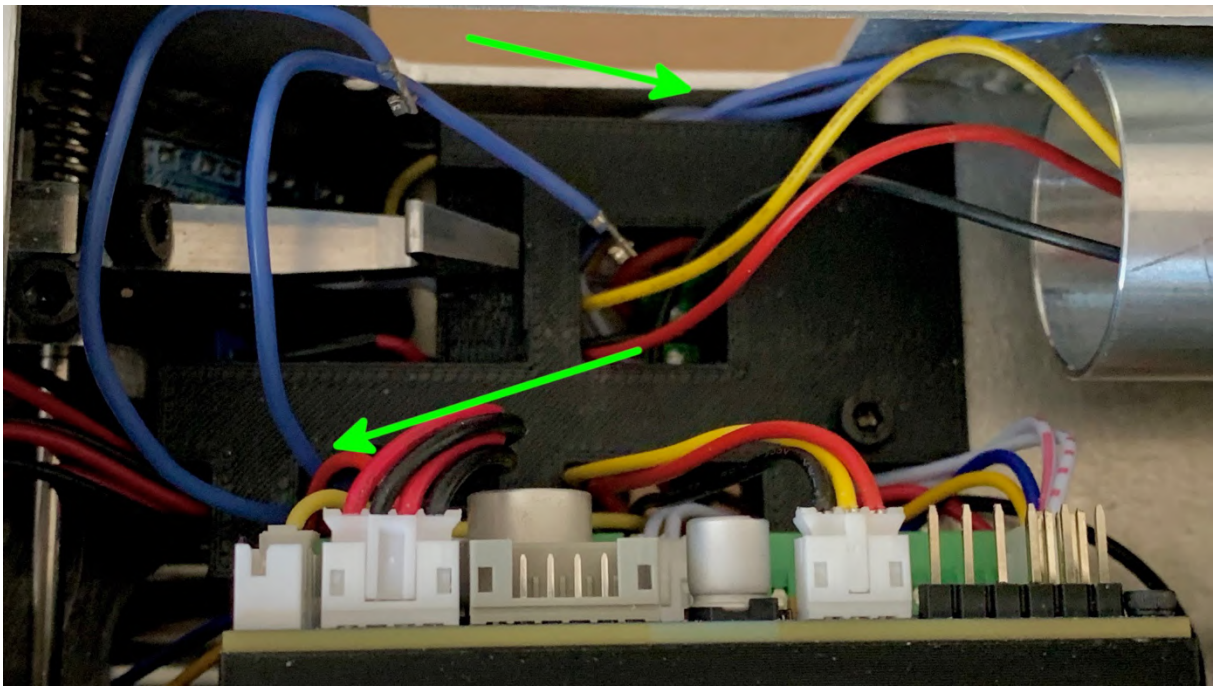


Run the wires through the indicated outer hole on the Neutrona Wand body.

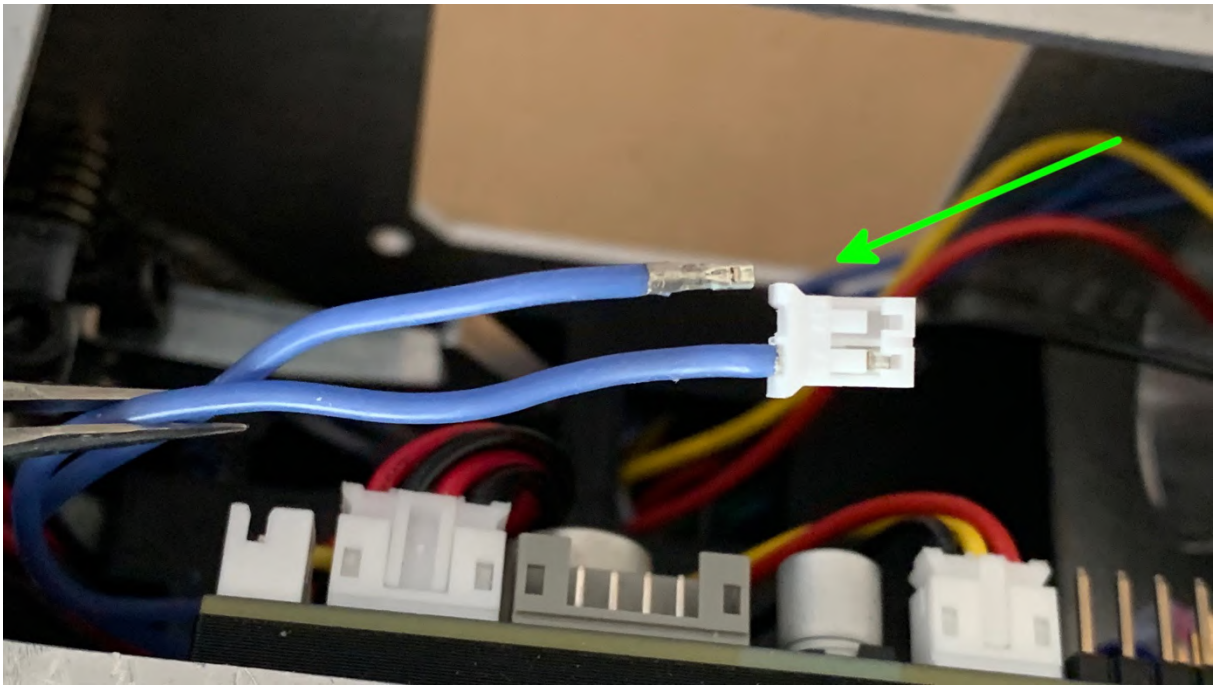


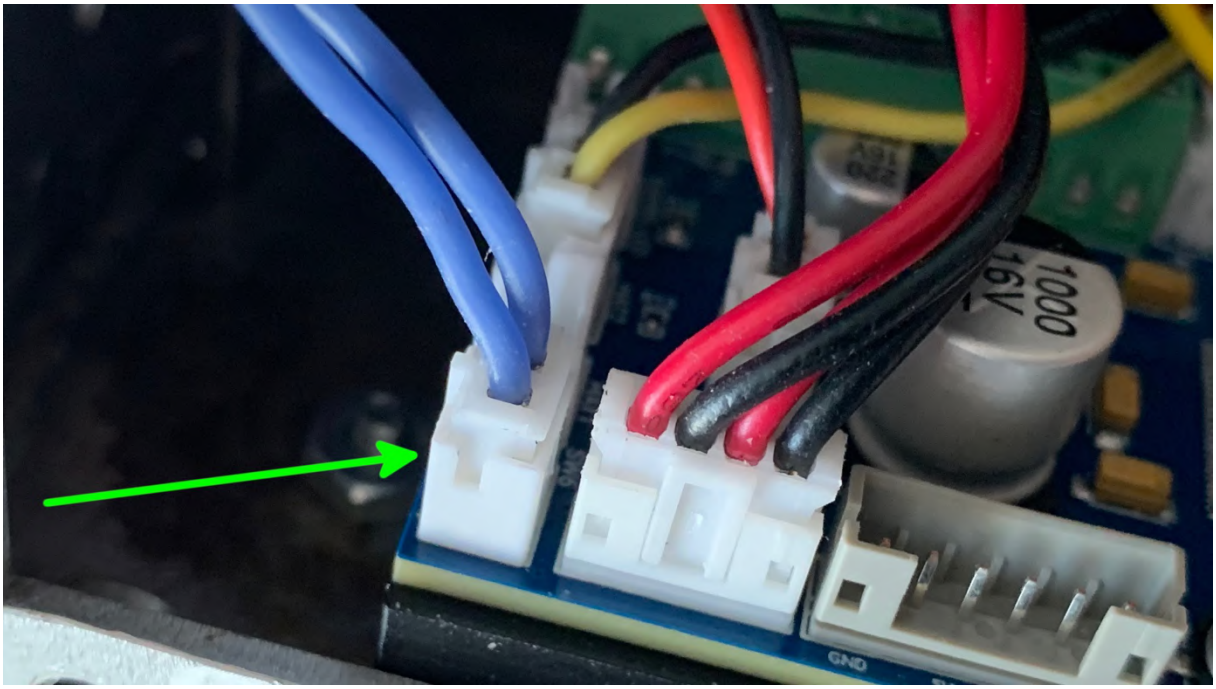


Feed the wires under the wire cover and back up on the other side as indicated.

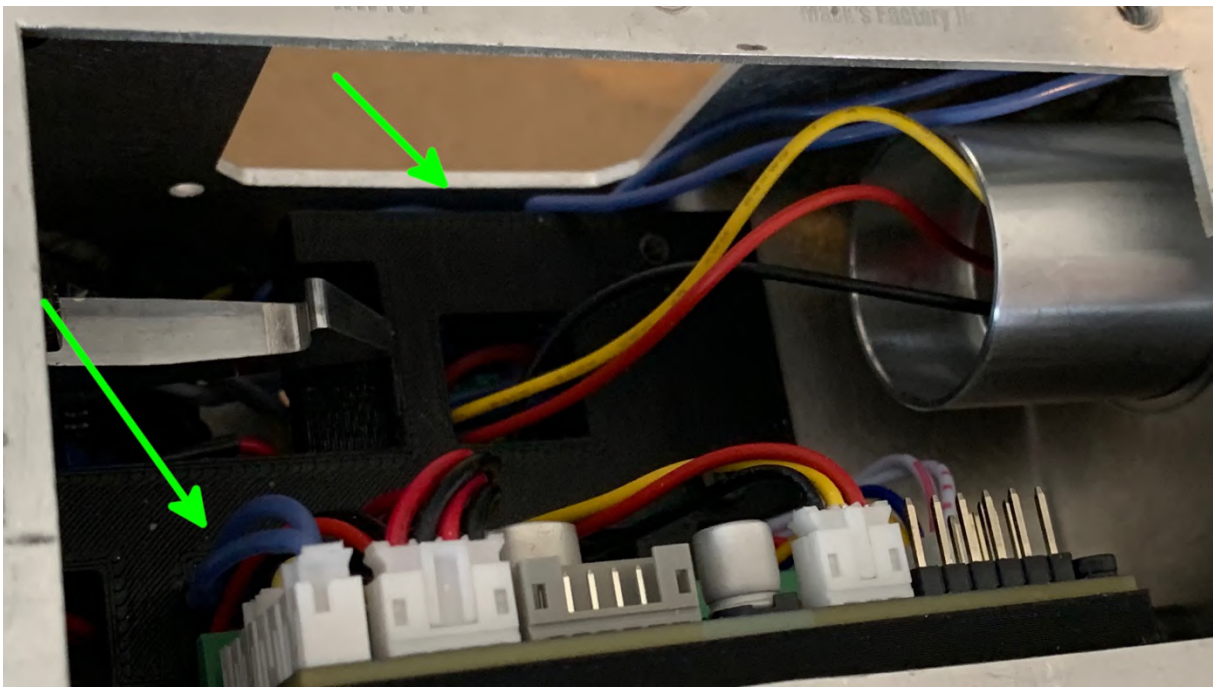


Attach the JST-PH housing to the wires. It does not matter which wire goes into which slot. Then plug the connector into the SW6 connector on the GPStar Neutrona Wand board.

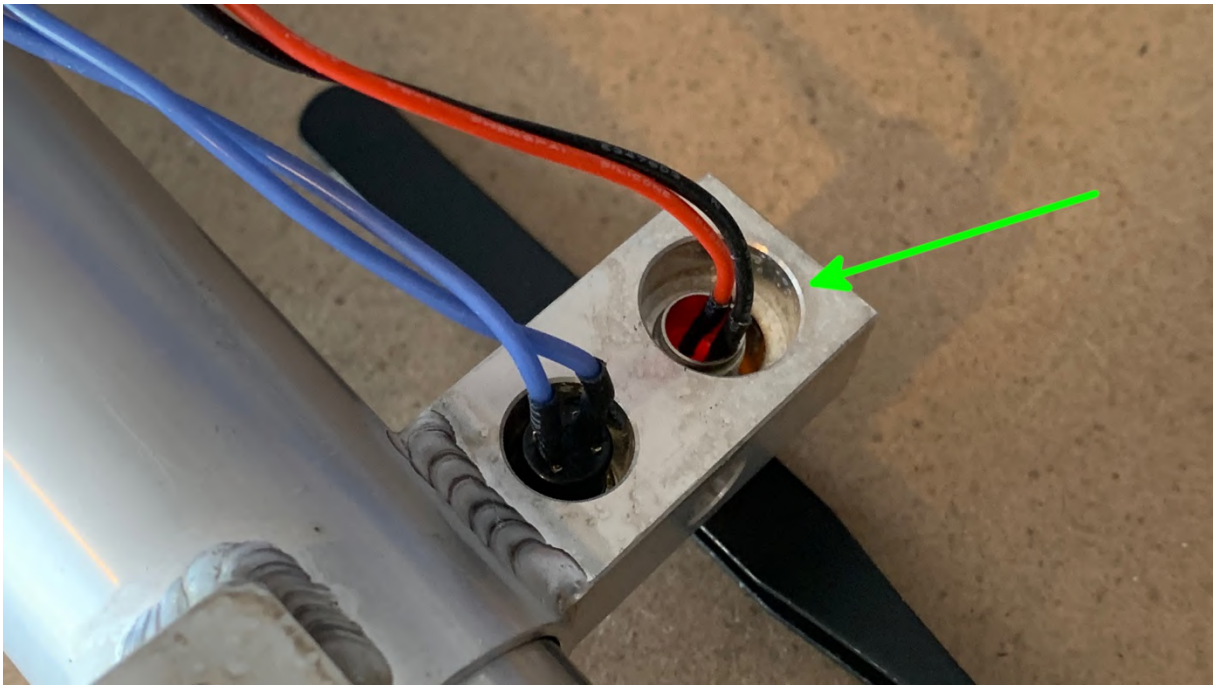




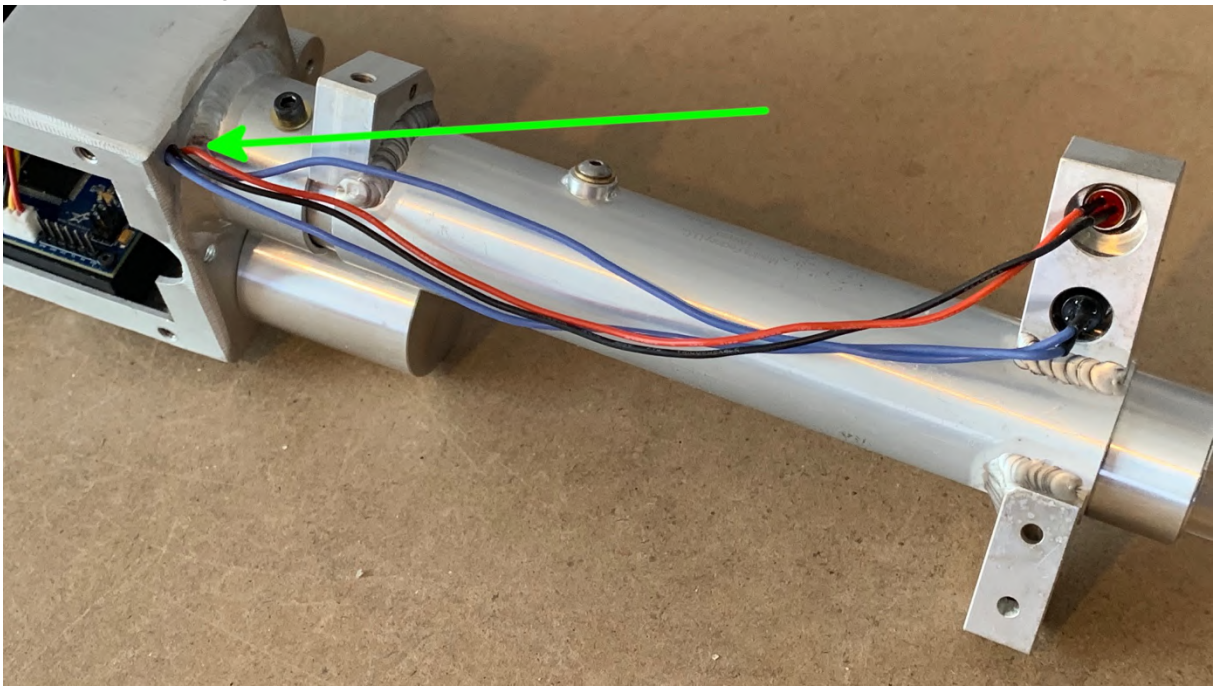
Tuck the excess wires under the wire cover.



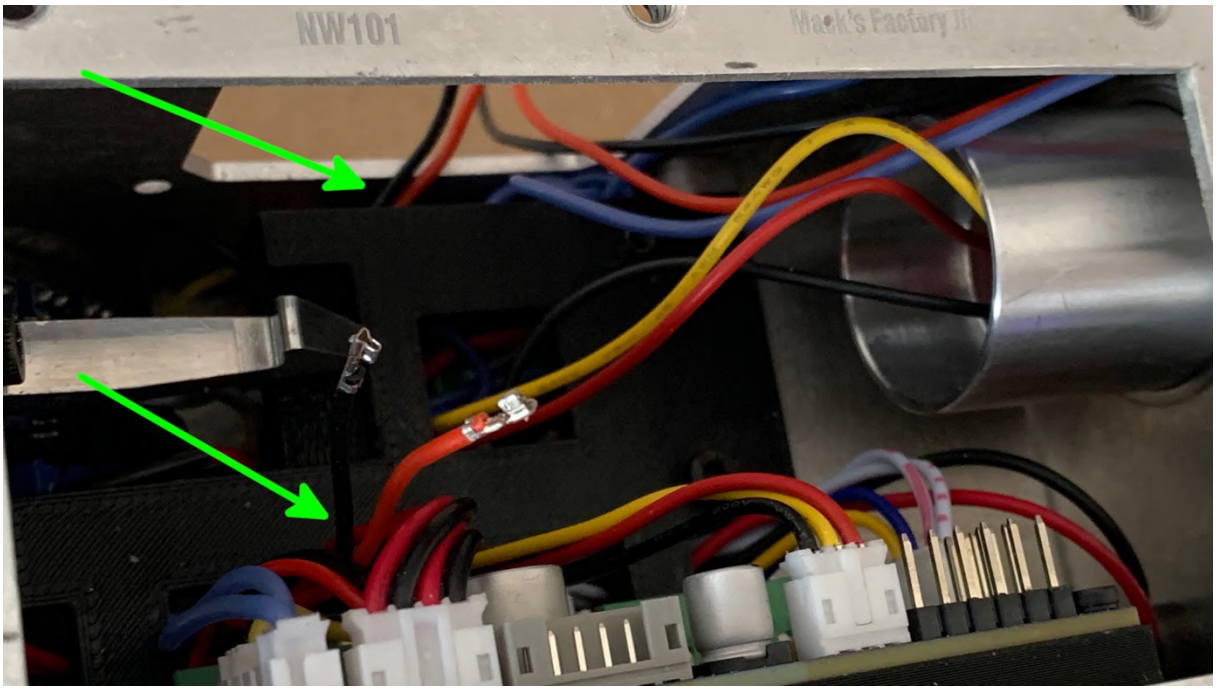
Install the led into the hat on your barrel wing. How you install the led will be up to you, some use hot glue, clear silicone, screws, etc.



Feed the led wires through the same outer hole on the Neutrona Wand body. Take note that the wires should be snug on the outside of the barrel, as they will remain hidden underneath the Neutrona Wand grips when installed.

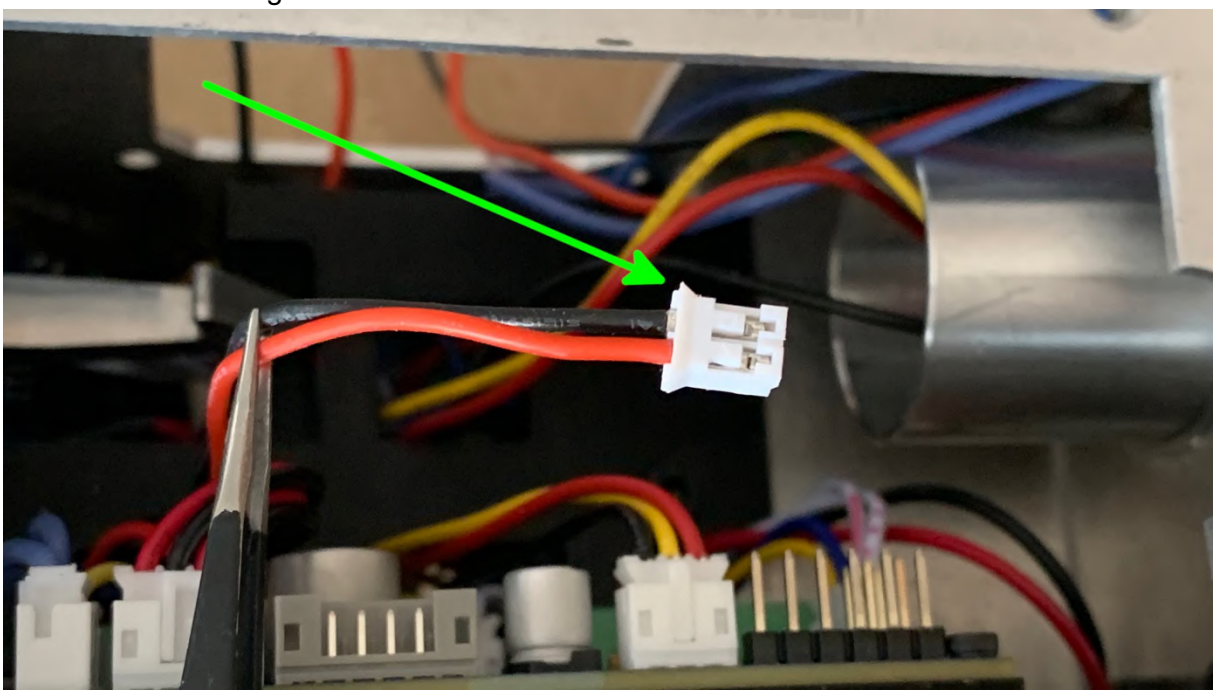


Run the wires under the wire cover and back up on the other side as indicated.

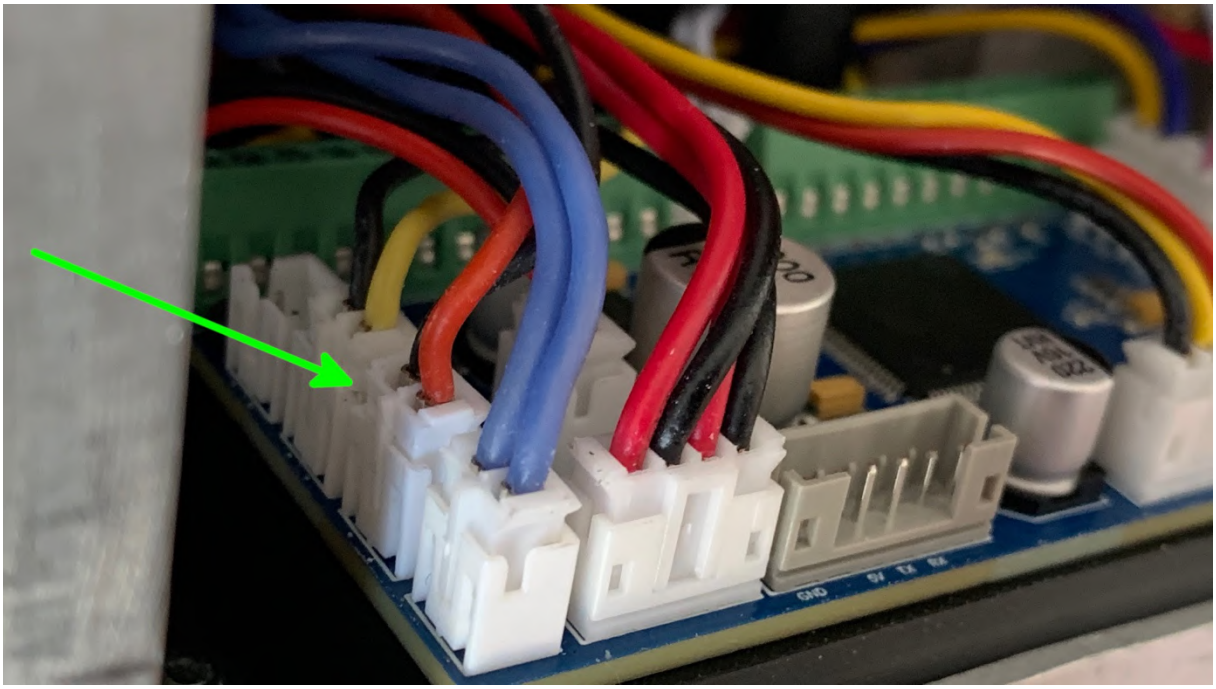


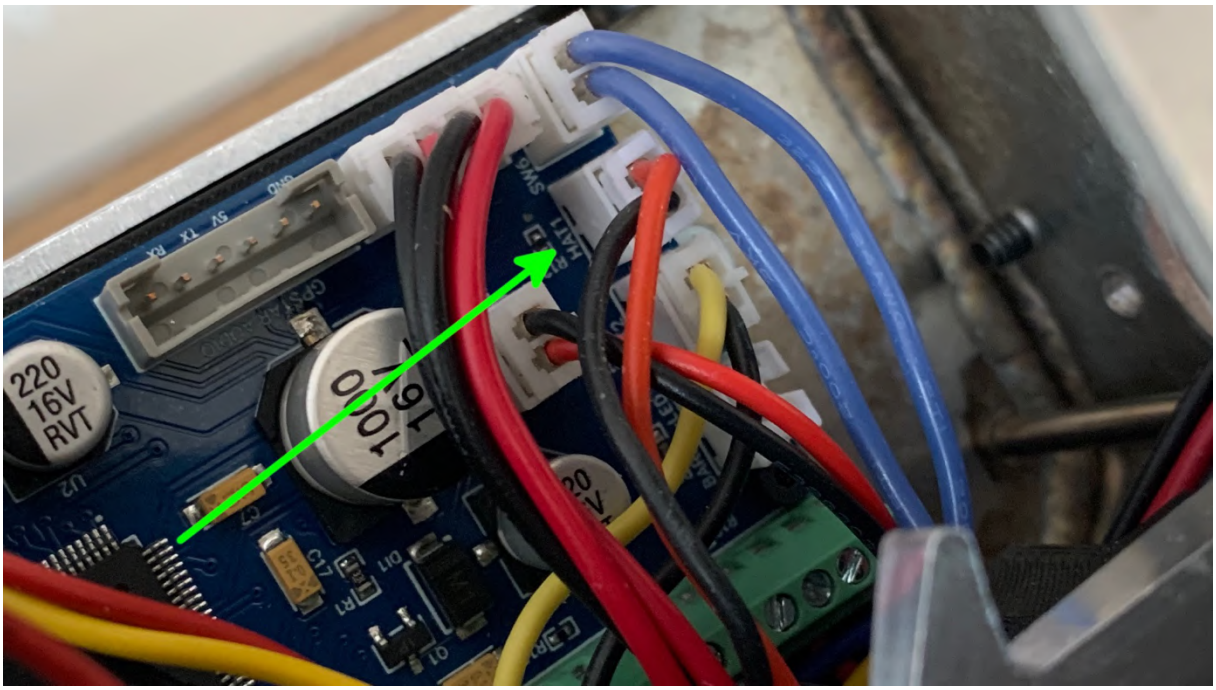
Attach the JST-PH housing to the wires.

IMPORTANT : It matters which wire goes into which slot. Reference the following photo for which slot the wires go into. Note the orientation of the connector.

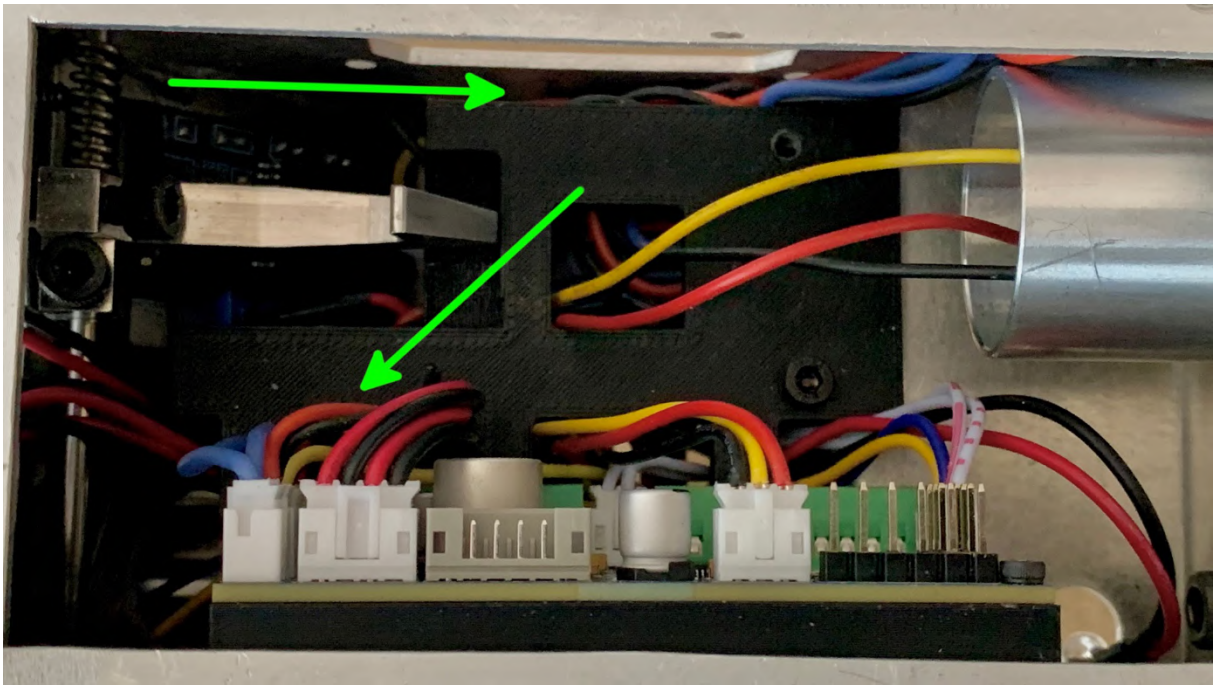


Plug the connector to the HAT1 connector on the GPStar Neutrona Wand board.

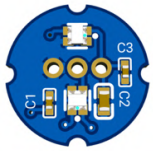




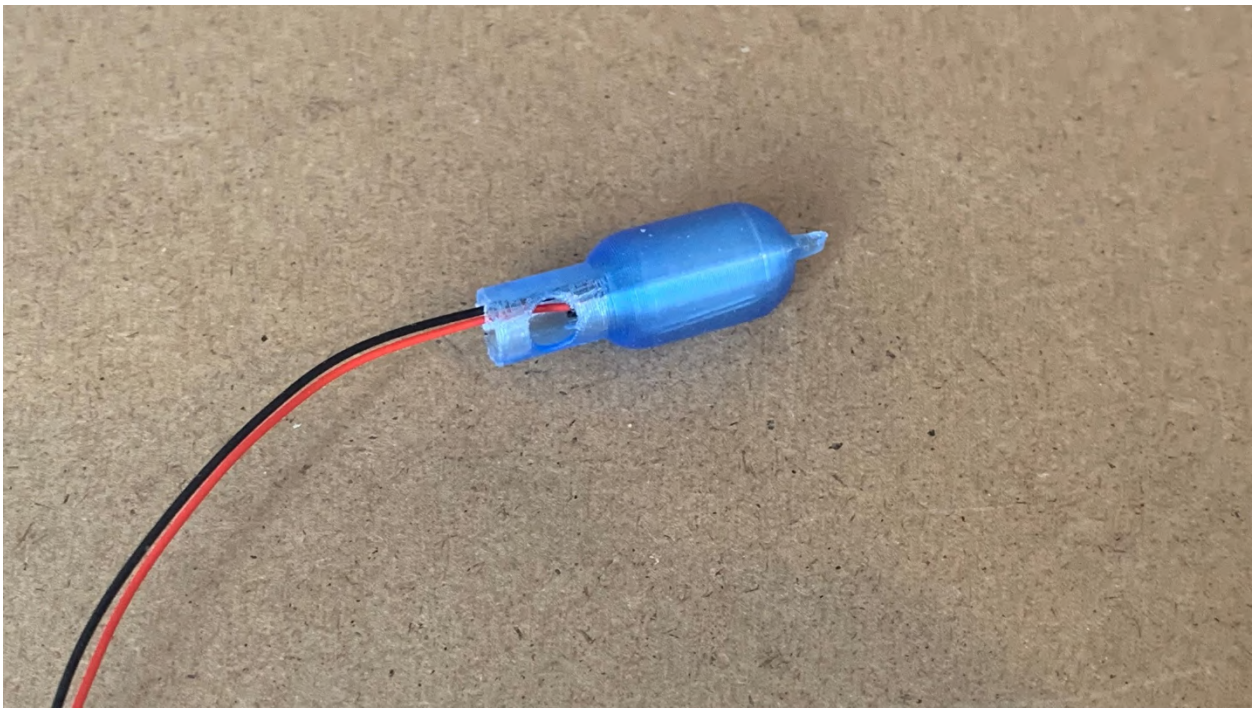
Tuck in the excess wires under the wire cover.



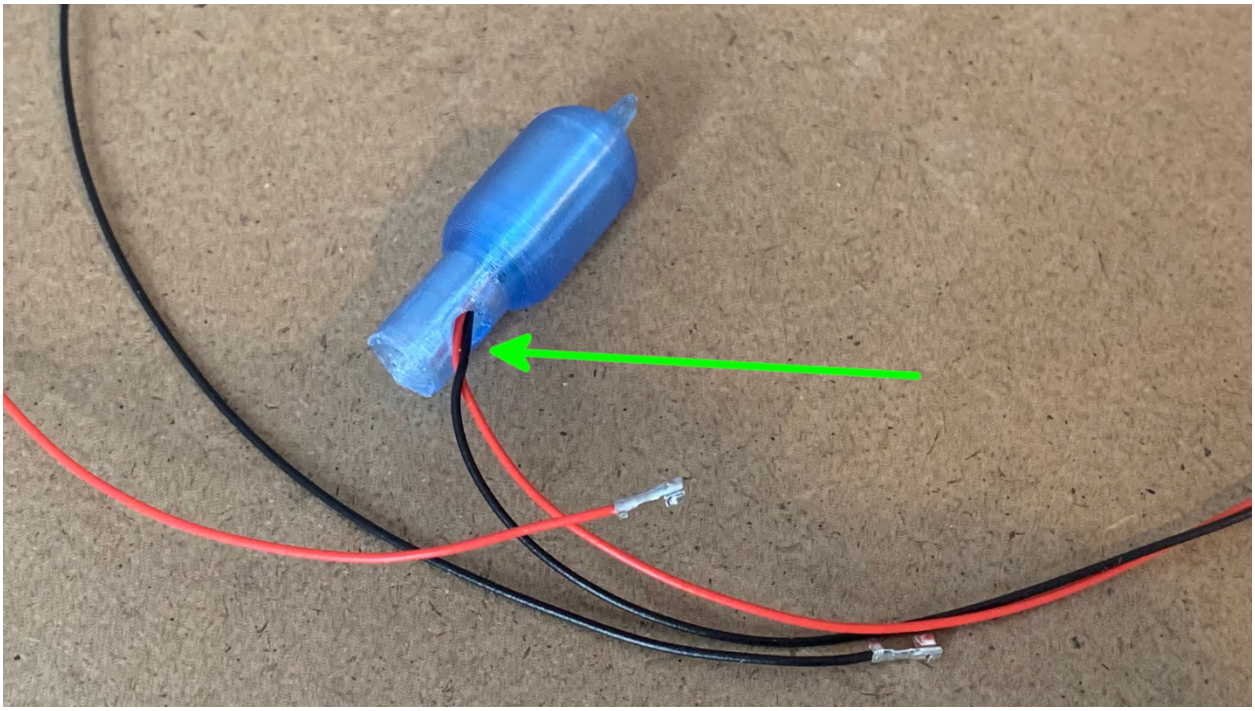
(Optional) : Barrel Emitter Tip: Use in conjunction with the GPStar Barrel LED Mini.



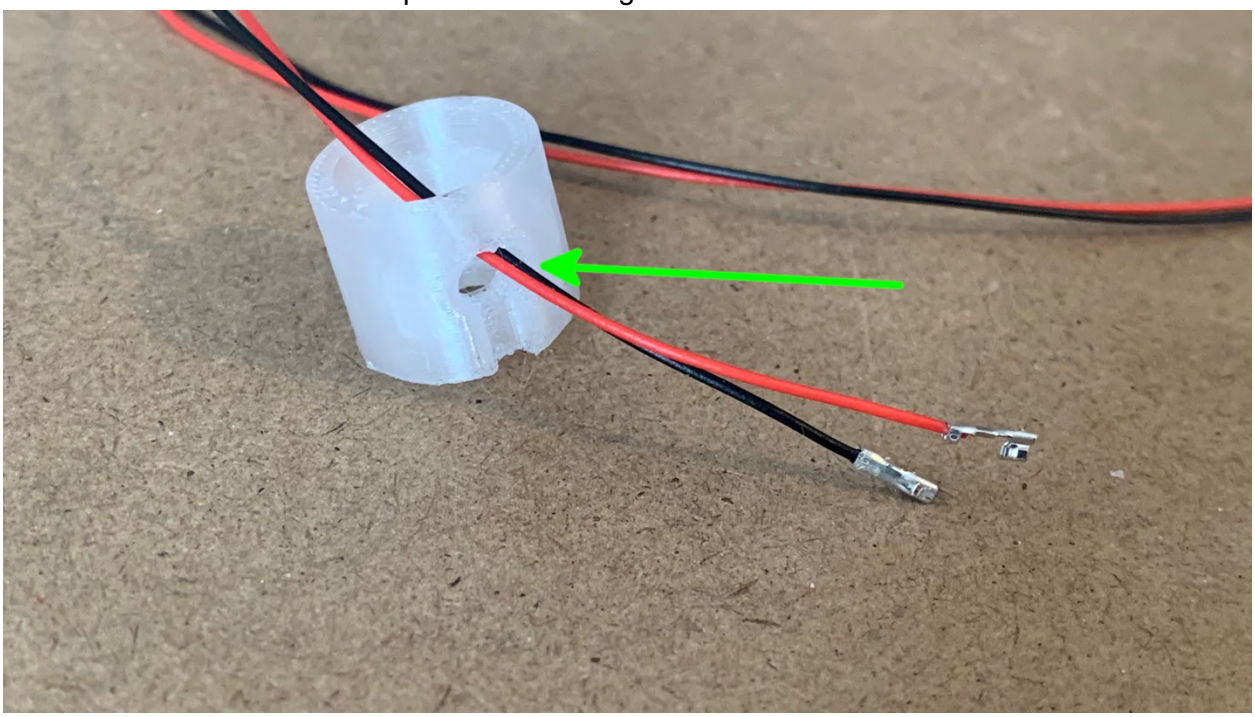
Insert the barrel emitter tip led into the bulb tip.



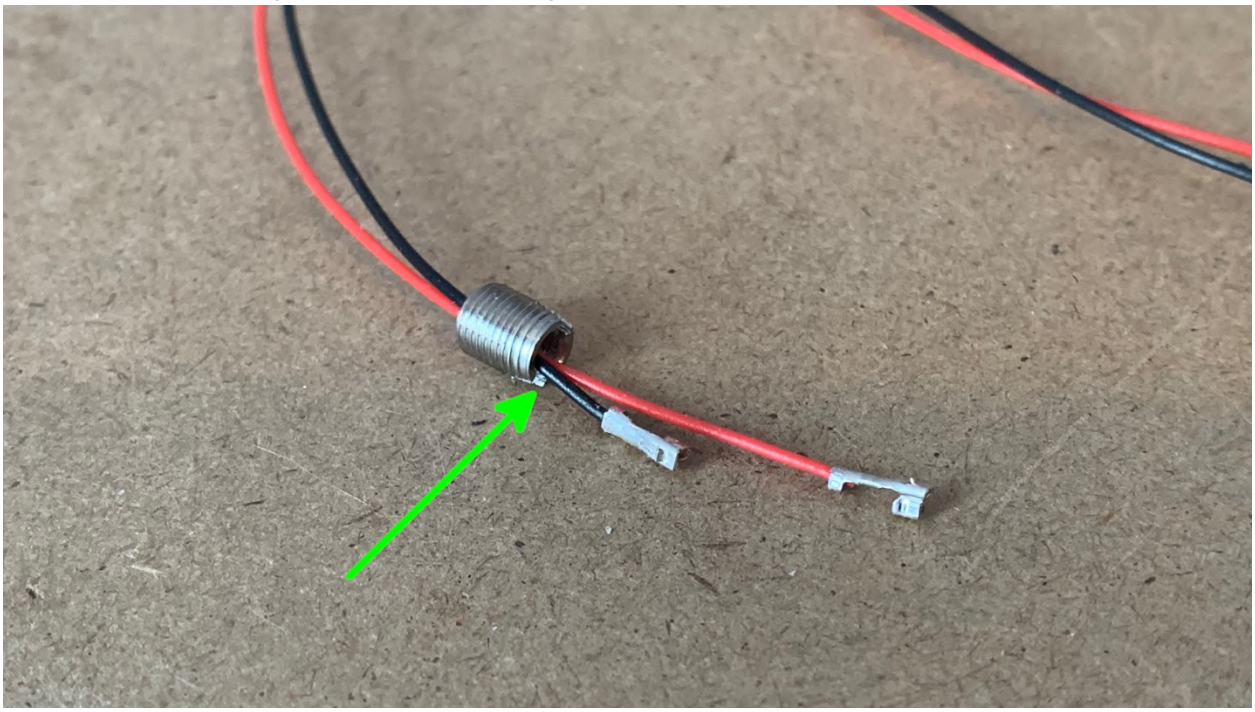
Feed the wires into the mounting hole into the bulb tip.



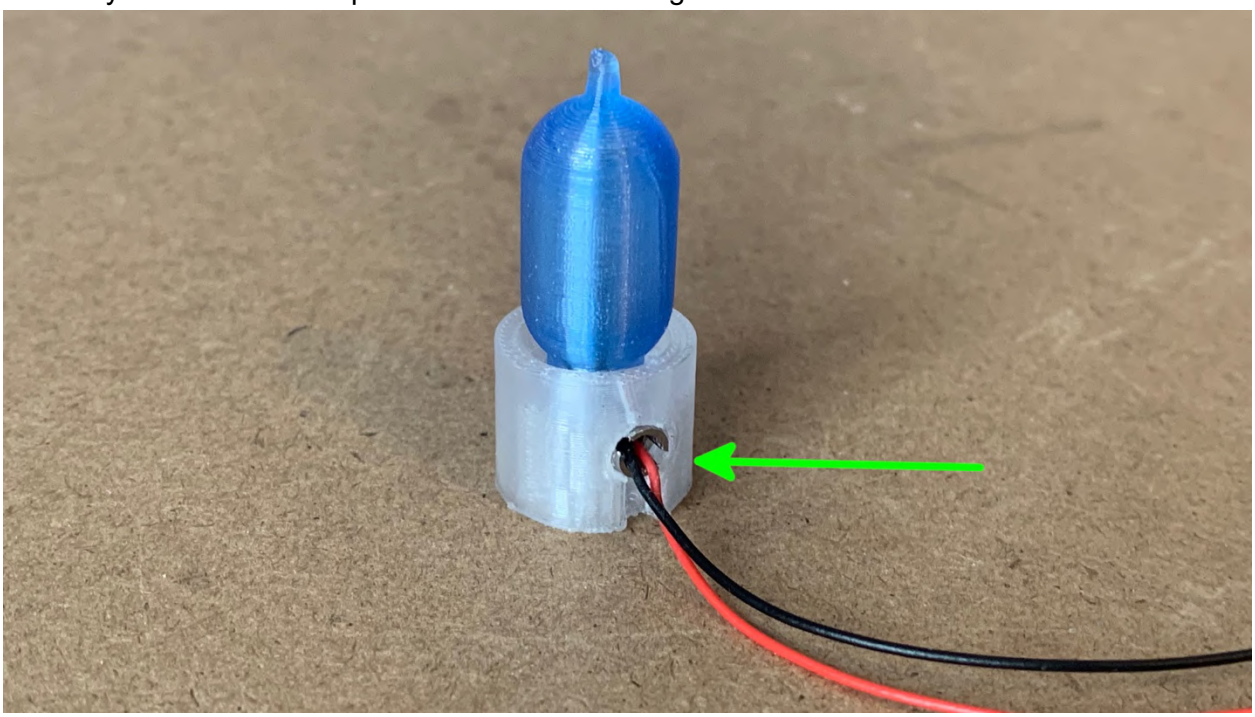
Then insert the barrel emitter tip led wires through the hole on the side of the base mount.



Pass the wires through the included through hole screw.

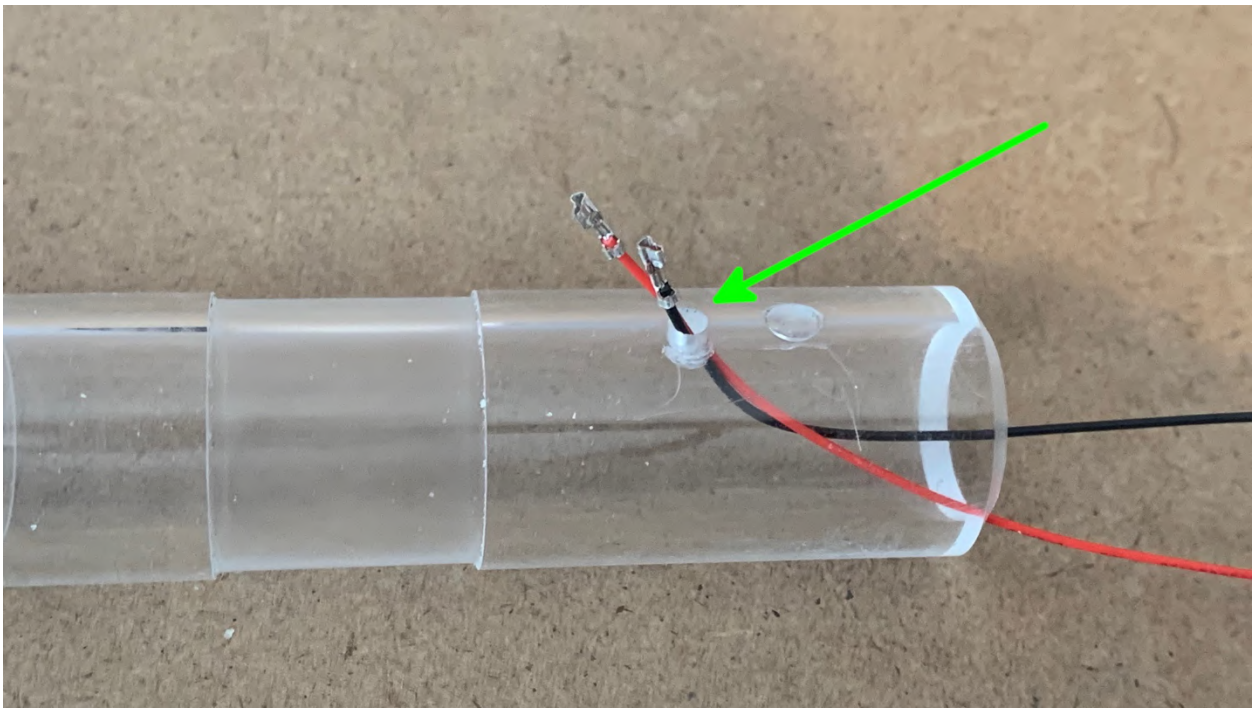


Carefully secure the bulb tip with the included through hole screw.

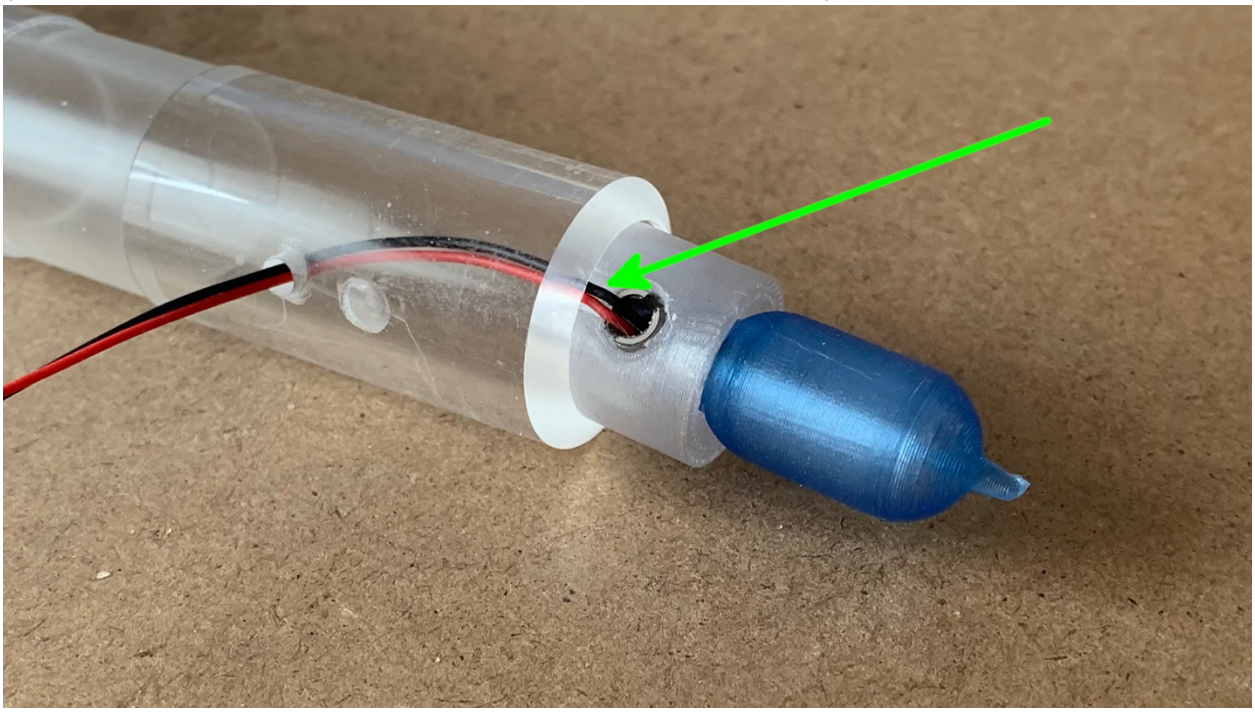


TIP : Go slowly when securing the screw as you do not want to pinch or damage the wires. You can use pliers to hold the screw from the outside and turn it in, then finish off securing it carefully with a small flathead screw driver.

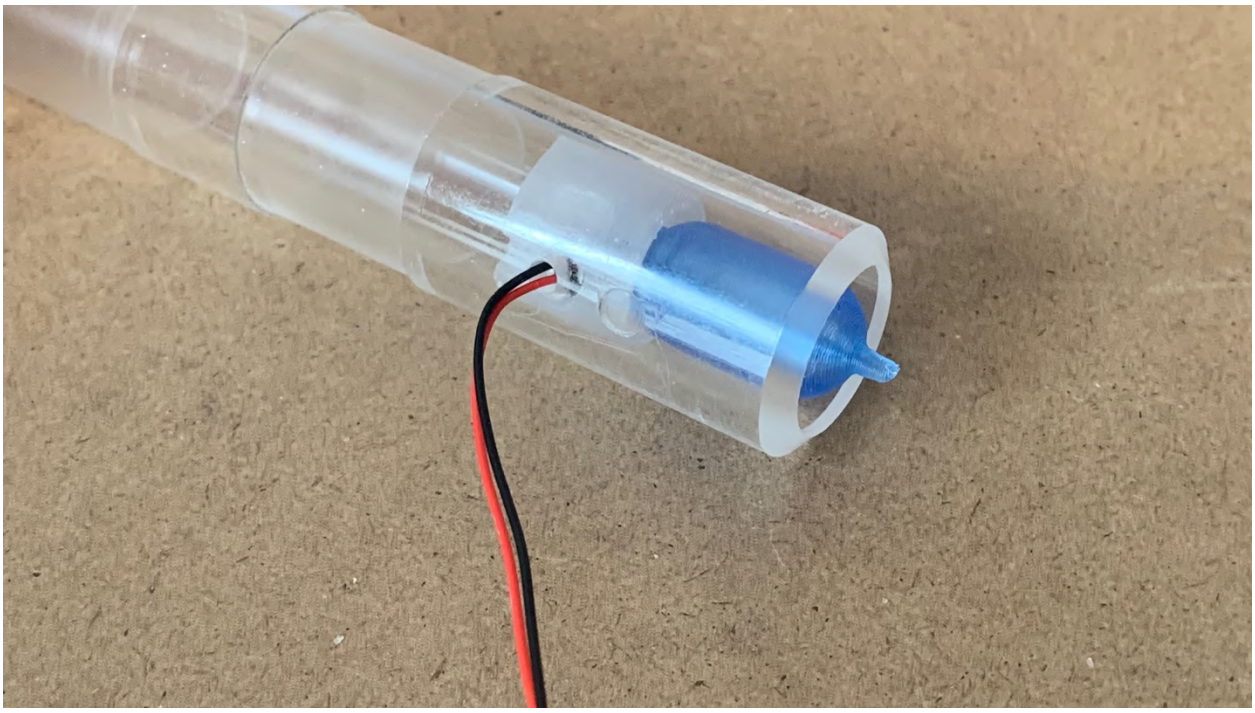
Continue to feed the wires feed the wires into the emitter tube and out the small hole on the side.



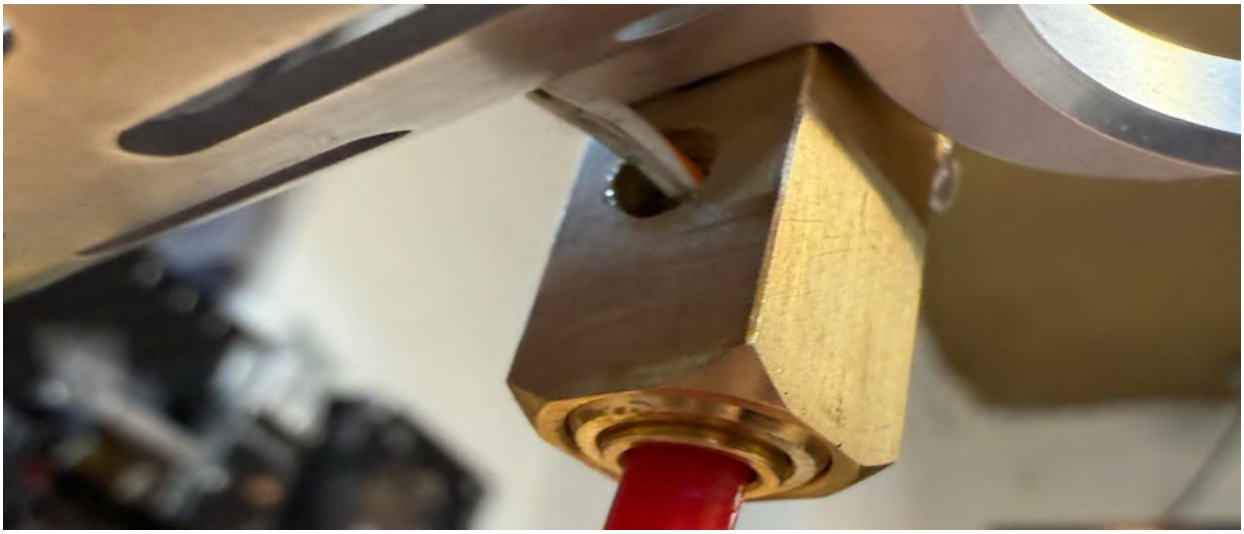
Carefully slide the assembly into the emitter tube. Make sure the wires are in the small cutout groove in the base of the mount, which protects the wires during installation.



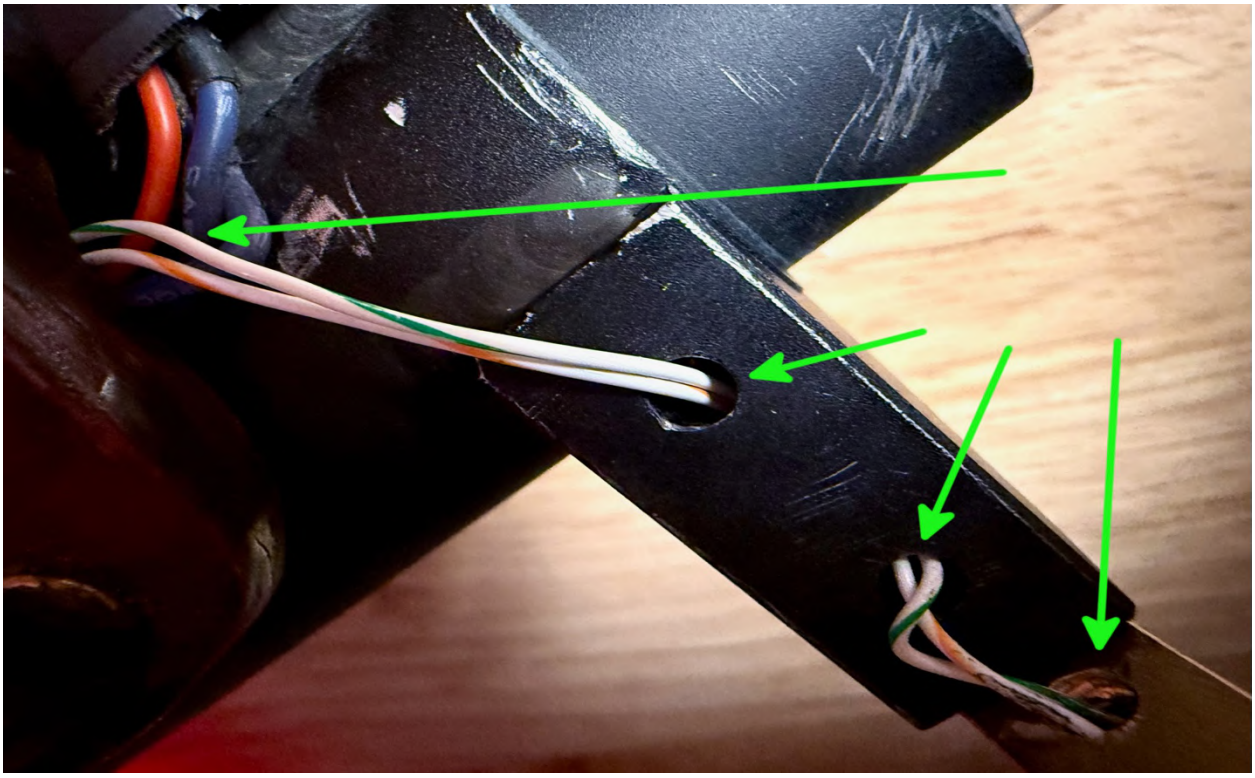
NOTE : The base press fits into the tube. To further secure the assembly, a small dab of hot glue may be necessary on the small hole where the wires feed out on the emitter tube to help prevent strain on them when using the barrel pop mechanism.



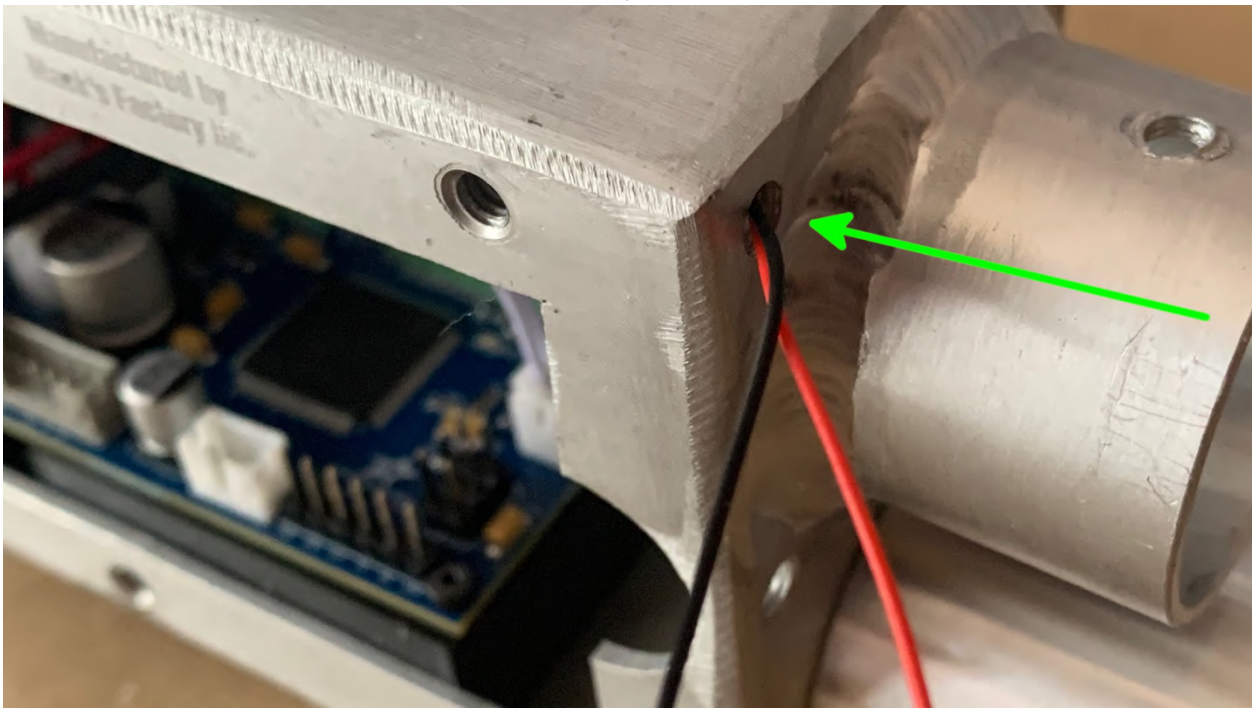
Drill a 3mm size hole into the sides of both banjos. Feed the LED wires through the side of the banjo next to the Neutrona Wand Emitter Tip and out of the bottom into the red tubing.



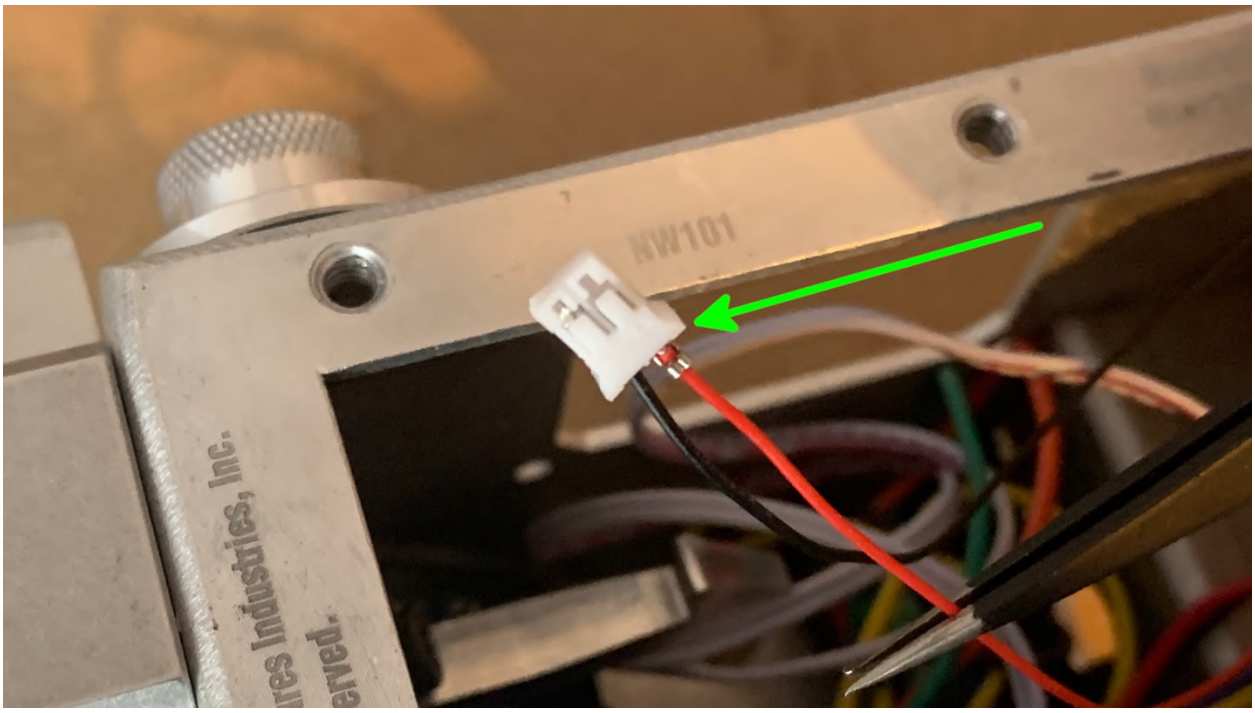
Continue to run the wires to the second banjo on the end of the Neutrona Wand barrel and through the bottom of the second banjo and out of the hole on the side. Then continue feeding the wires through the side of the Neutrona Wand barrel and out on the bottom and across to the other side with the wires from the barrel switch and barrel hatlight LED.



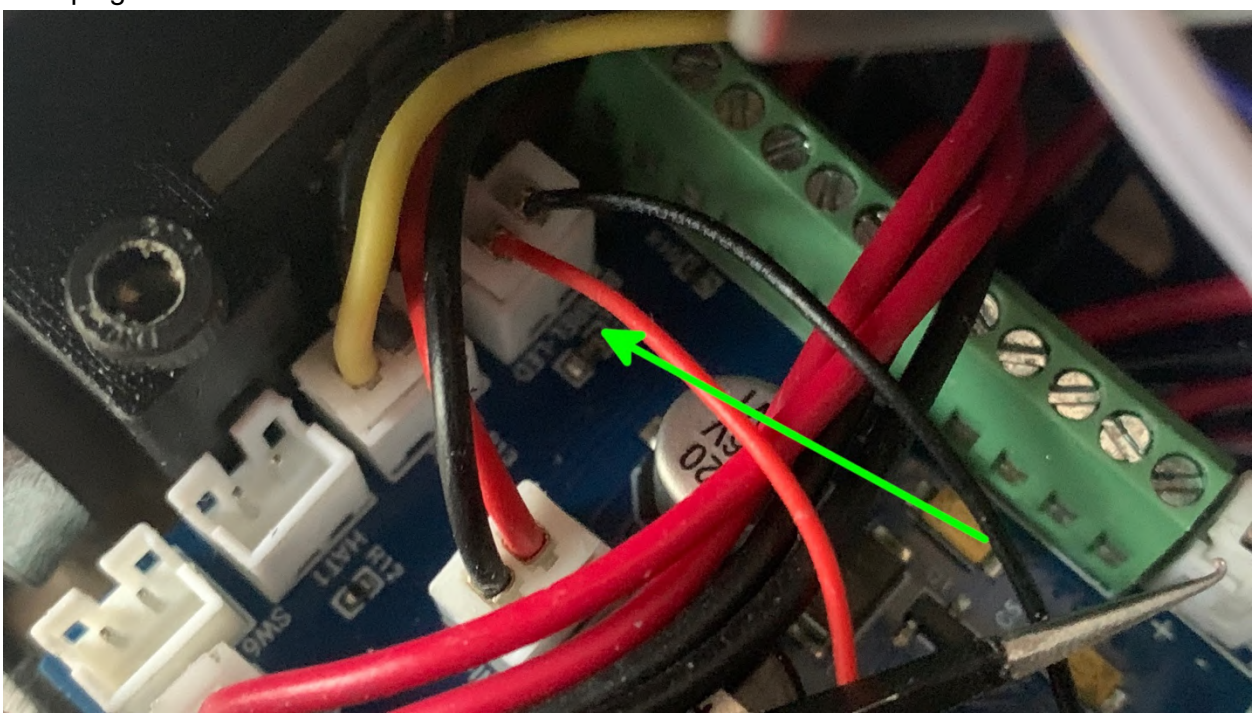
Run the LED wires into the Neutrona Wand body.



Connect the included JST-PH housing to the LED wires. The position of the wires into the connector is important. Note the orientation of the connector.

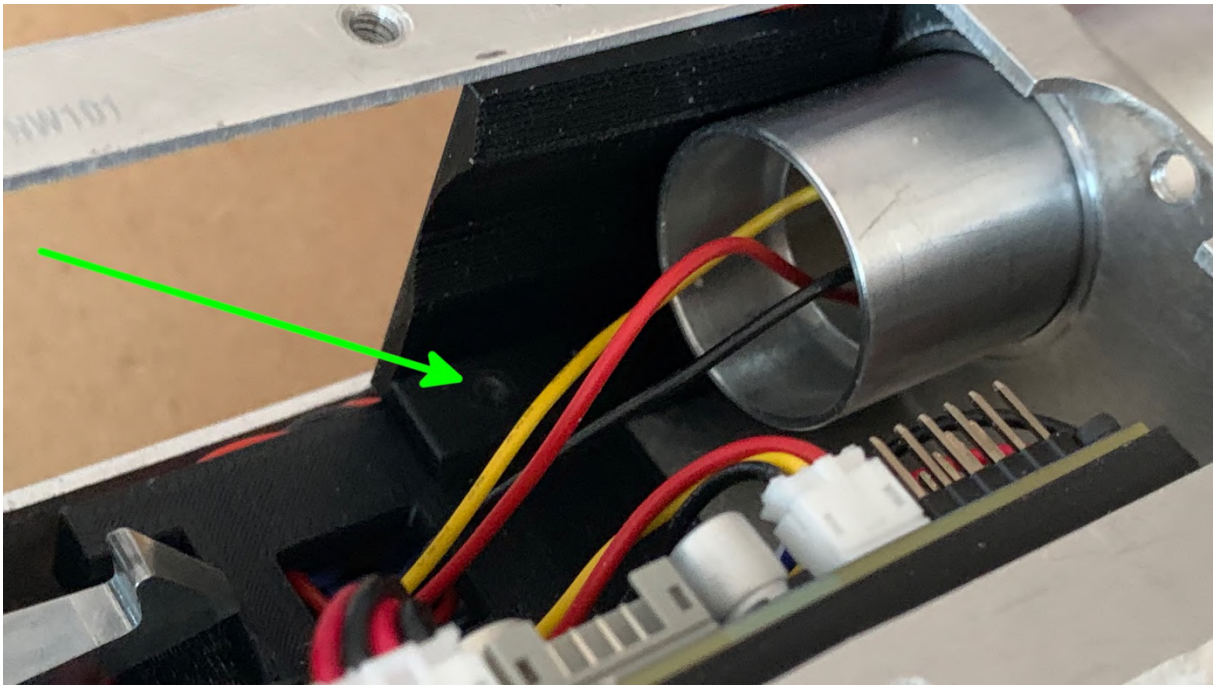


Now plug in the LED to the BARREL-LED connector on the GPStar Neutrona Wand board.

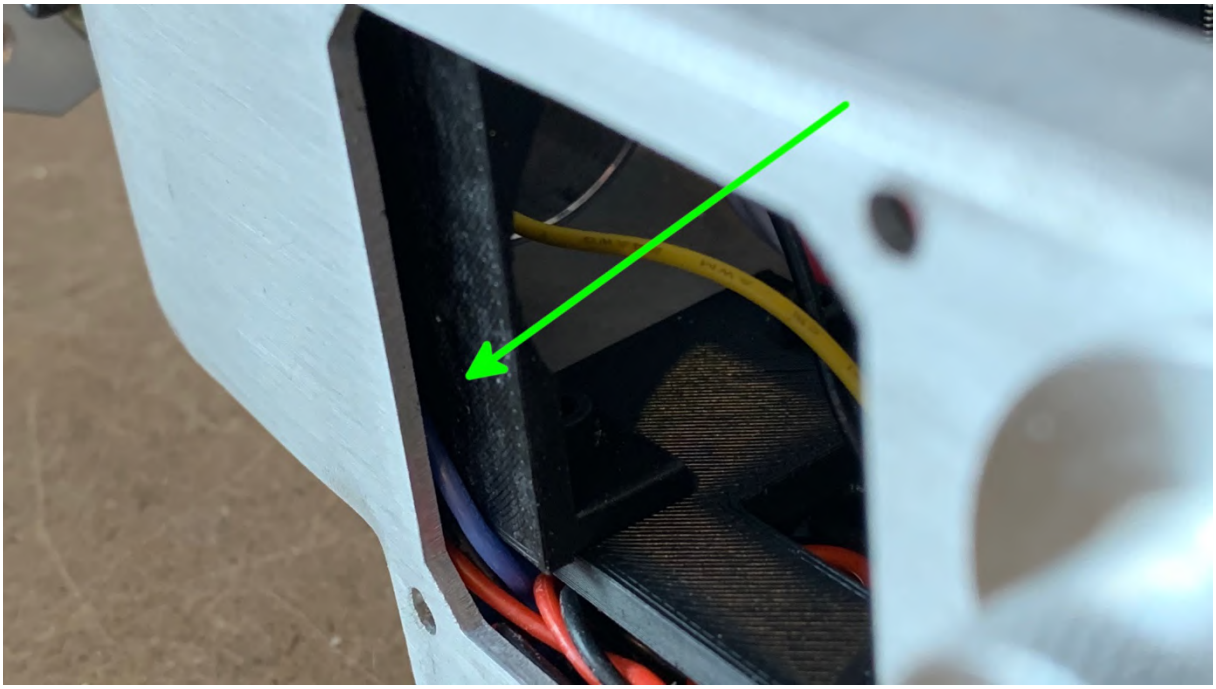


Take the side wire cover and install it onto the wire cover.

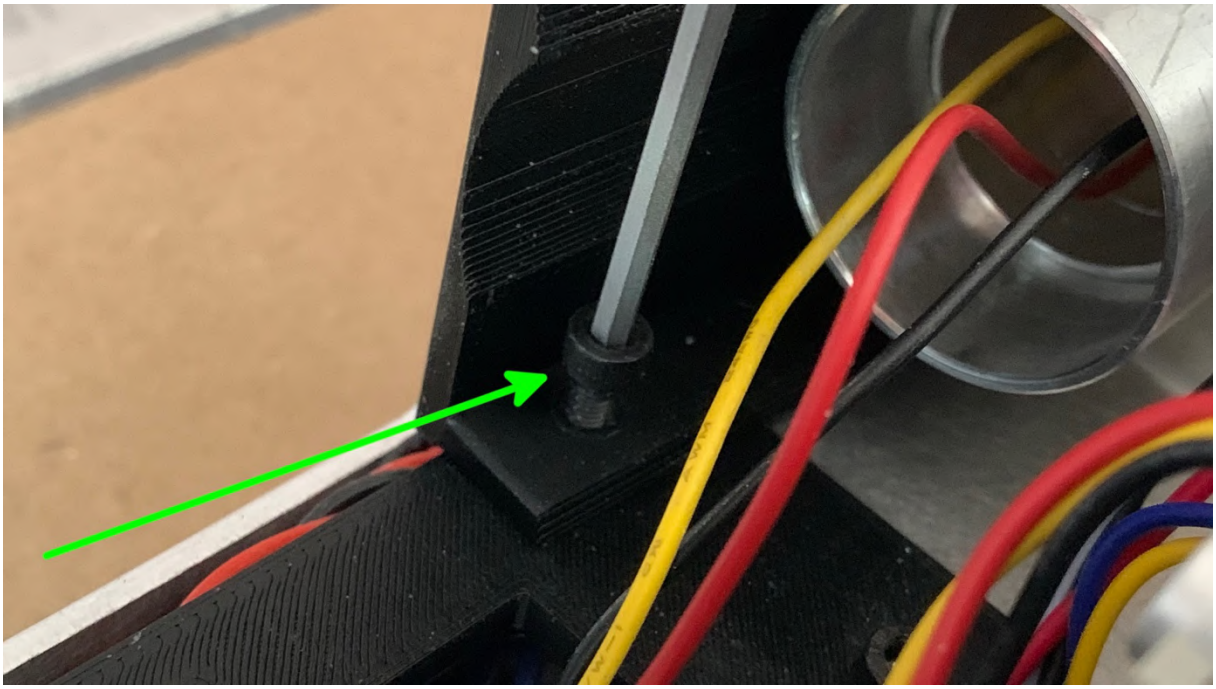
Line up the hole of the side cover over on top of the hole on the wire cover.



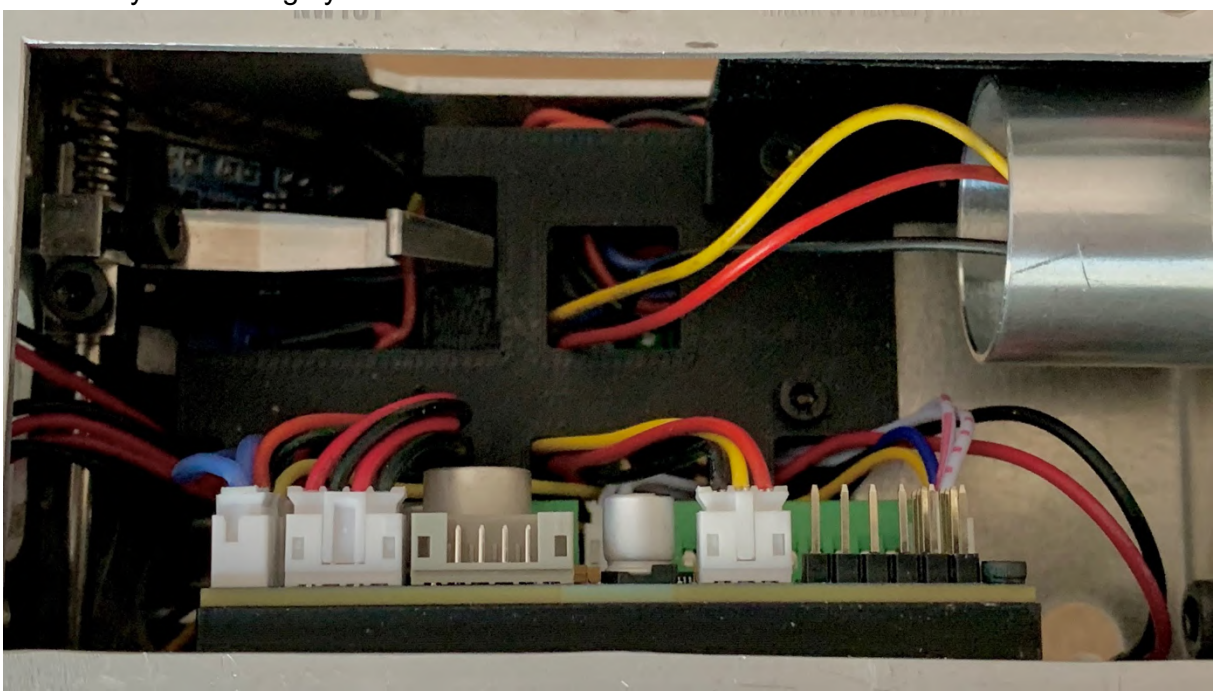
Tuck the barrel wing switch wires, barrel hat light led wires and any other additional wiring behind the side wire cover.



Tighten the side wire cover to the wire cover with the included m3x4 screw.



Tuck away and manage your wires under the wire covers one last time.



Congratulations, you have finished installing the GPStar electronics into your Mack's Factory Neutrona Wand. Now proceed with finishing assembling your Mack's Factory Neutrona Wand.

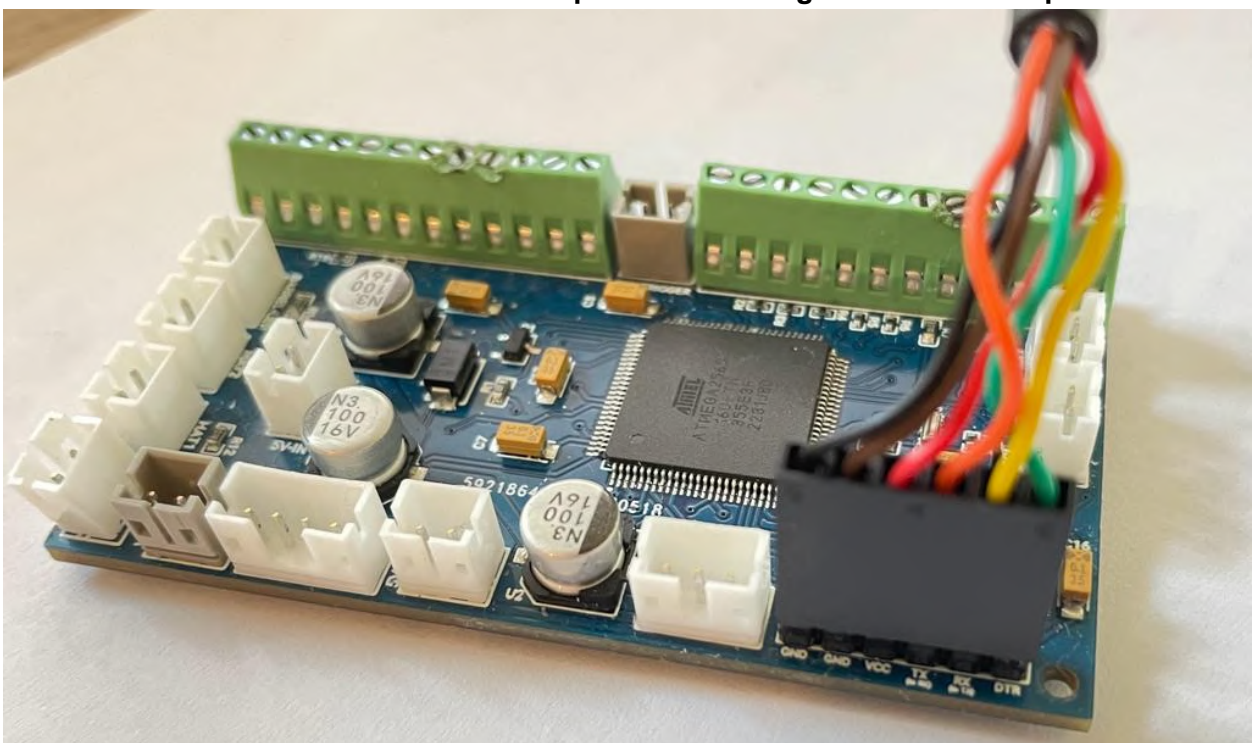
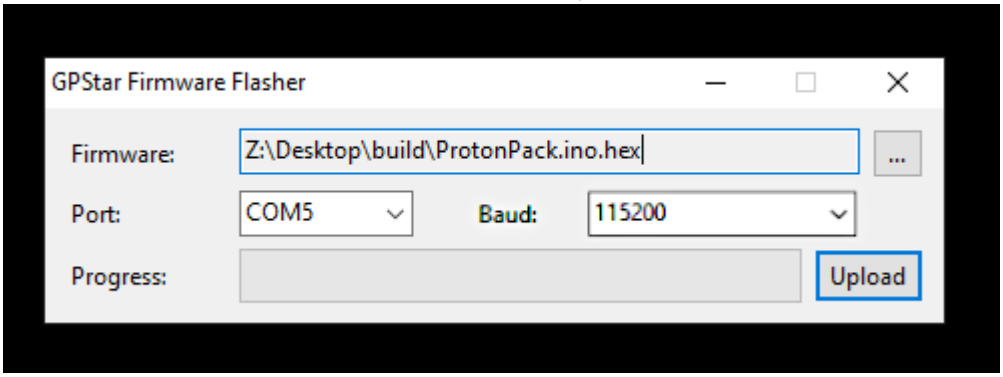
Post-installation Guides

For an operation manual please visit:
https://github.com/gpstar81/haslab-proton-pack/blob/main/OPERATION.md

Updating Firmware

Download the Firmware flasher (Windows or Mac) and firmware from:
https://gpstartechnologies.com/pages/support-downloads

Using the included programming cable, connect it to your computer and the GPStar Neutrona Wand board. Ensure the **black wire lines up with GND** and **green wire lines up with DTR**



Open the firmware flasher software then select the firmware from the firmware selection box. Then select the PORT for the connection to your GPStar Board and click UPLOAD.