Saberz Project O1 Chassis Installation Guide

Version 2.3 – January 2024

Contents

1 Disclaimer and Important Starting Notes

Disclaimer

- Perform your chassis installs at your own risk. These instructions are intended to only outline and suggest the installation process we followed to perform successful installs on this chassis set.
- These instructions are NOT intended to replace the vendor documentation for any of the electrical components described in this document. It is especially important you read and become completely familiar with all vendor-provide instructions and documentation. Be sure to download and carefully read the ProffieBoard and NPXL documents from the vendor.
- Read and understand this document completely before moving forward with your install. All steps are very important. Failure to read this document completely (and not following the steps correctly) can result in damaging your chassis, hilt and/or electronic components!
- It is assumed you, as the installer, have experience with soldering, wiring and proper handling of electronics and follow all safety protocols.
- Exact instructions for soldering the wires to your ProffieBoard are not provided, only the wiring diagram we used for our installs.
- Never use a heat gun anywhere near this chassis as all 3D printed parts are sensitive to heat.
- Please use care when doing your install! We are not responsible for any damages done to your chassis (and/or hilt) by you or your installer during the install process.

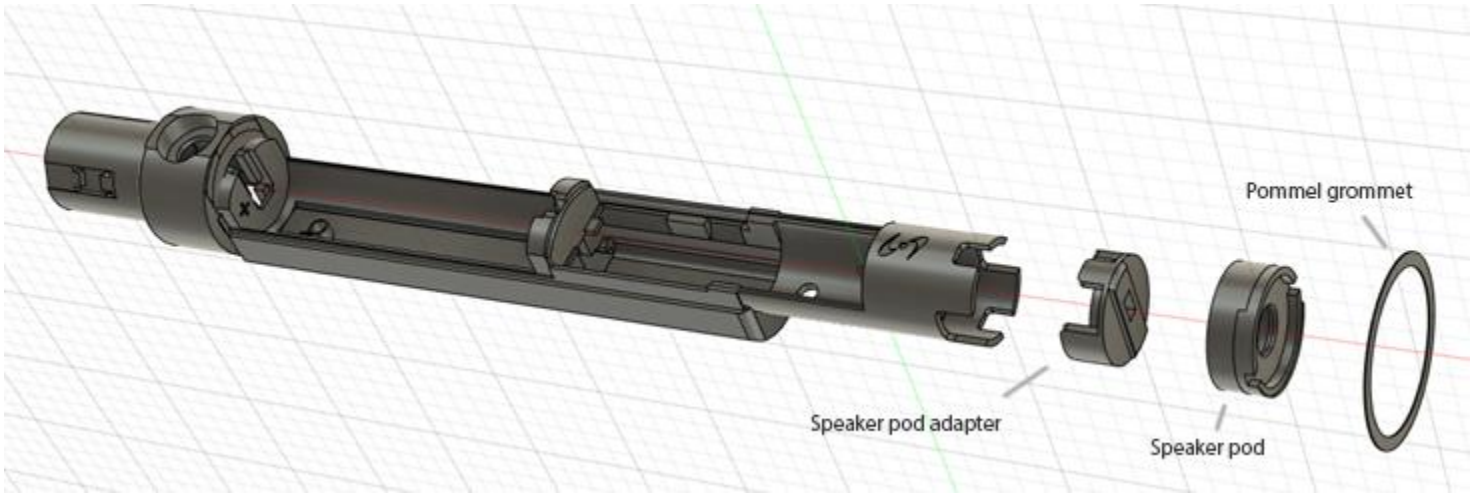
Important Starting notes

One of the biggest mistakes when installing a chassis is 1) using too much glue and 2) not providing extra length of wire for all components (speakers, tactile switches, NPXL PCB, the ProffieBoard etc..). This is critical for supporting future servicing of components which can go bad. Using just a small amount of gap filling type superglue (or hot glue in some areas) will provide full adhesion of the parts, and yet will allow the removal of the part when the bead of glue is broken with a razor. Over-gluing components will result in destruction of the chassis when said parts are attempted to be removed, such as when needing to be replaced (e.g. if a speaker or the ProffieBoard goes bad). Additionally, not providing extra wire for all components will result in insufficient wire length to be able to solder on a new part, such as a blown speaker or defective NPXL PCB. This chassis is designed with enough room inside to allow extra wire for all components.

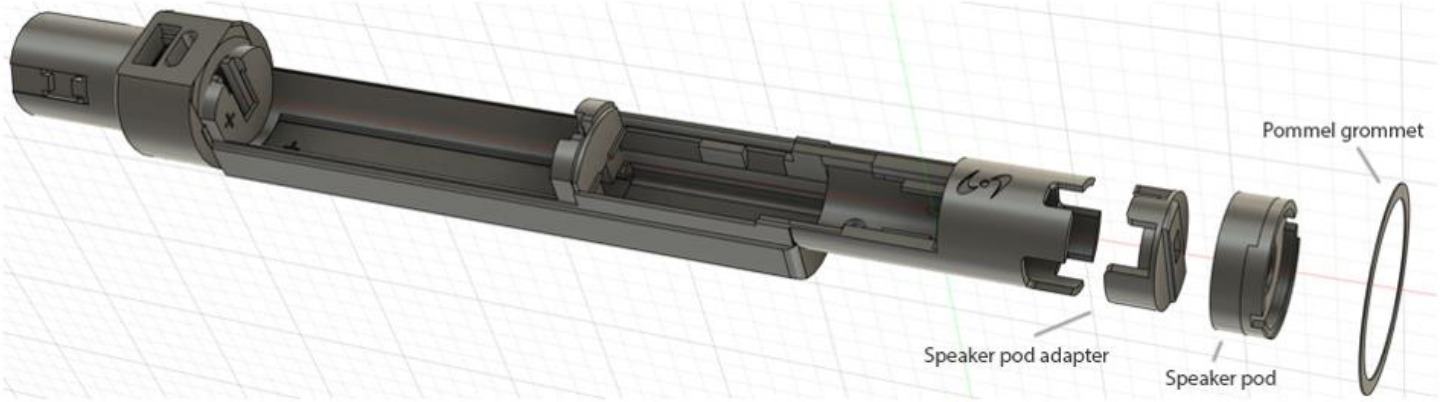
2 Chassis Models

Both Chassis versions are designed for a default 20mm speaker and supports 7/8 NPXL blades. However, a 28mm speaker pod kit is available as seen below.

Standard version – utilizes a 2.1mm Recharge Port



USB-C version – designed for USB-C data/charging



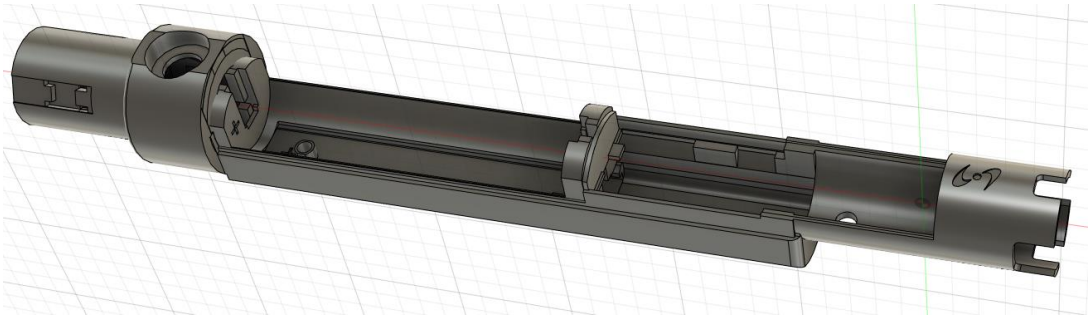
2.1 Supported Features

- ProffieBoard v2.2
- Built-in Keystone 18650 battery sled for fully removable battery
- Shtok V3 NPXL connectors
- Designed for a 20mm speaker
- A 28mm speaker pod upgrade kit is available

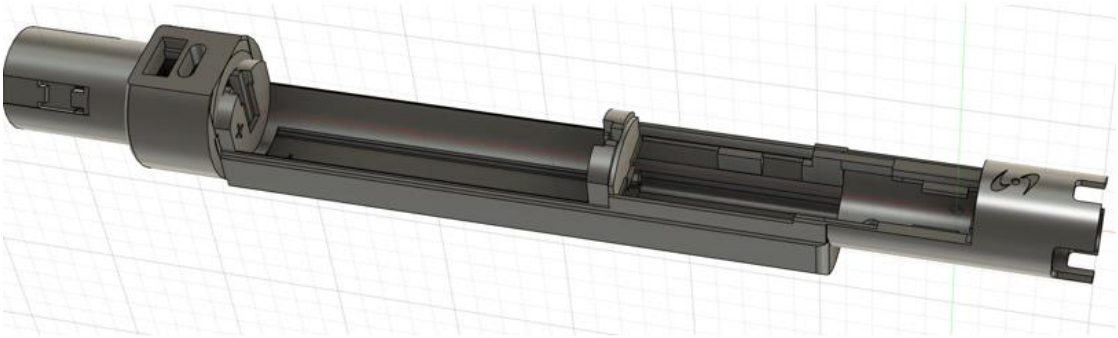
2.2 Included Chassis Parts

The chassis is offered 3D-printed in SLS material. What's included:

- 3D printed SLS custom chassis main body (RCP version):

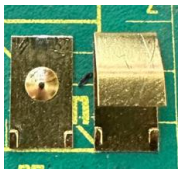


- 3D printed SLS custom chassis main body (USB-C version):



- 3D printed FDM PWR/AUX button shims (for use if needed):

- Also included is a set of metal (+) and (-) tabs for the built-in 18650 battery sled.



Note: Shapeways customers will need to purchase a set of posts directly from Digi-Key:

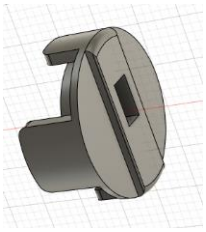
Negative:
https://www.digikey.com/en/products/detail/keystone-electronics/1016-1/5118842

Positive:
https://www.digikey.com/en/products/detail/keystone-electronics/1010-1/8347181?fbclid=IwAR3AN70vmGTvAjGl2wB8aEAph_kLqgSGXrzlNhwX1jrrpXoW1VDnXbr889c

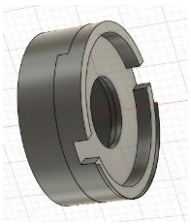
2.3 Optional Chassis Parts

The optional speaker pod parts will allow a 28mm speaker to be used:

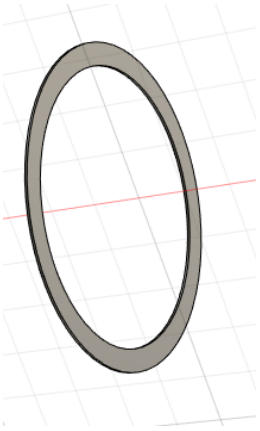
- Speaker upgrade kit parts:
  - Speaker pogo-pin adapter:



  - Speaker PCB pod:



  - Pommel gasket (FDM):



2.4 Intended Button Functions

- Large red button - PWR
- Gold button – AUX

3 Required Parts

3.1 Suggested Parts List

This chassis was designed for (and tested with) the following suggested parts:

- Saberz Project O1 3D-printed chassis kit, available at:
  - Saber-Fights Etsy store
- Proffieboard v2.2
- SanDisk or Patriot (suggested) SD card.
- SHTOKCUSTOMWORX NPXL V3 HILT SIDE PCB CONNECTOR – LONG PINS
- NPXL LED PCB Lens Cover
- Brass tactile switches– (2) This chassis is designed for 1.7mm (0.4mm plunger height) switches. Be sure to purchase extras in case any are defective or lost during the install process.
- Speakers - both chassis models were developed for the following specific speakers:
  - For the 20mm version of the chassis:
    https://www.thecustomsabershop.com/3w-20mm-Speaker-P837.aspx

  - Speakers for the optional 28mm speaker pod parts:
    28mm:
    TCSS 4W 28mm WOWSpeaker - this speaker produces excellent results within the sound resonance chamber of this hilt.
    Alternate:
    Smuggler's Outpost Elite 28mm Elite 2W 4OHM Bass Speaker

  - Two-pin connector set required for the 28mm speaker pod kit - ShtokCustomWorx SPKR PCB 2-Pin Connector Set:
    https://www.etsy.com/listing/1220528708/shtokcustomworx-spkr-pcb-2-pin-connector?ref=yr_purchases

The following RCP and charger will be needed for the standard RCP version:
1A 3.7V Li-ion smart charger with 2.1mm plug
- 2.1mm Recharge Port

For the USB-C version:
Order USB-C kits by contacting Dimitry Shtok:
https://www.facebook.com/shtokcustomworx

High Amp Kill Switch:
- From KR Sabers
- From Digi Key, SKU TS01CQE

Battery - Sony Li-Ion 18650 3.7V 15A 3120mAh PCB Protected Rechargeable Battery
- Alternative:
  https://www.illumn.com/18650-keeppower-3120mah-sony-us18650vtc6-protected-high-discharge-button-top-p1831r-r-series.html

- For the standard RCP version only - suggested Micro USB Cable Cord – required to fit into SD card connector on the ProffieBoard within this chassis:

A to Down Angle Micro B - Down Angled Micro USB Cable - 1x USB A (M), 1x USB Micro B (M) - Black (USBAUB2MD)

Glue – We have great success using gap-filling super glue (in very small amounts) for all areas of this install requiring glue. It provides a very strong hold, and at the same time allows the removal of parts where needed (example given, if a speaker blows or if a NPXL PCB goes bad and needs to be replaced). This is the exact product we use:
https://www.amazon.com/gp/product/B0000DD1QQ/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1

Hot glue works very well in certain areas, and is especially useful in gluing in parts which tend to push back out due to wire contention. It can also be completely removed if used in small amounts. We use a precision hot glue gun for the following:

- Securing speakers (within chassis and in speaker pods).
- Strengthening soldered wire connections on such parts as USB-C, micro-SD plugs and tactile switches. This completely prevents the soldered joints from breaking when the wires naturally move around during the install.
- Securing USB-C charging PCBs into the chassis.
  Securing any other parts in difficult to glue areas.

3.2 Wire and Component List

- WYCTIN 60-40 Tin Lead Rosin Core Solder Wire for Electrical Soldering
- 22 AWG wire (recommended):
- Red – NPXL power (+)
- Black – NPXL and Battery power (-)
- 28 AWG wire (recommended):
- Red – Board power (+)
- 28 AWG wire (recommended):
- Red – power (+)
- Black – power (-) and switches GND
- Green – Speaker (-)
- White – PWR (+) tactile switch / Speaker (+)
- Yellow – AUX (+) tactile switch
- Violet – DATA

For the USB-C version it is suggested to use 32 AWG for the data harness wires.
These wires are available from:
KR Sabers (recommended), or alternatively from Navships on eBay here. Purchase lengths in the following colors:

- Black
- Green
- Yellow
- Red

Soldering note – set the soldering iron temperature to recommended settings per electronics vendor documentation.

Additionally, after soldering each PCB is it suggested to use an appropriate PCB cleaner to remove residual flux before installing these parts into your chassis. We use WD-40 **Specialist electrical contact cleaner** spray with great success. NOTE: Be sure to allow this product to completely dry before inserting a battery into the chassis!

4 Preparation Steps

4.1 Chassis Preparations

No sanding or modifications is usually required for the SLS chassis parts, however be sure to see the below notes on test fitting all parts before starting an install. This chassis may not be available in FDM due to the intricate geometry of the built-in 18650 battery holder.

4.2 Before Starting

IN ADVANCE - TEST FIT ALL PARTS INTO THE CHASSIS - Even with the highest quality 3-D printed parts, (such as the SLS versions offered for this chassis set), there is always a slight possibility of undetectable tolerance variations in the finished product. Due to this we highly recommend test fitting all components before you start the installation process.

Check fitment of all electronic components as follows:

- Emitter opening – Test-fit an assembled NPXL PCB in this area before starting the install. Remember NPXL PCBs usually have raised edges which need to be sanded off before use.
- The ProffieBoard holder area –Be sure to sand any raised edges along the ProffieBoards and then ensure they press-fit into place.
- Built in battery post slots – (see preparation steps for these in section 8.1).
- Test-fit the speaker into the speaker holder areas at the emitter end of the chassis.

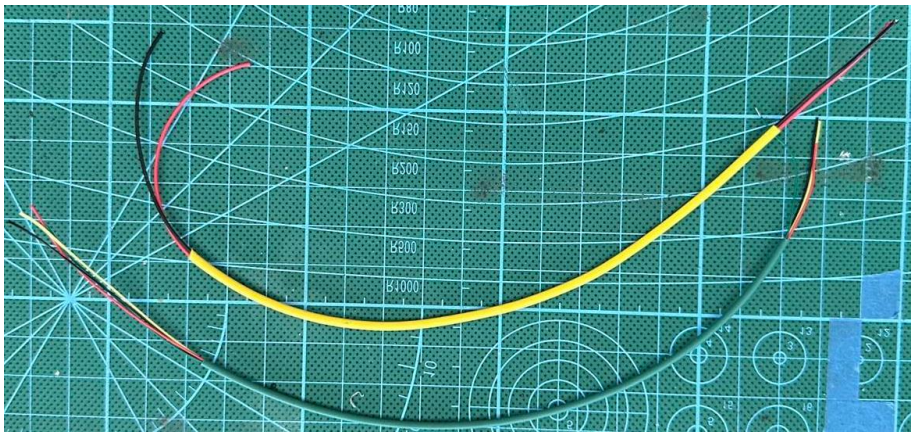
5 USB-C Version - Kill Key Switch and USB-C Port Harnesses

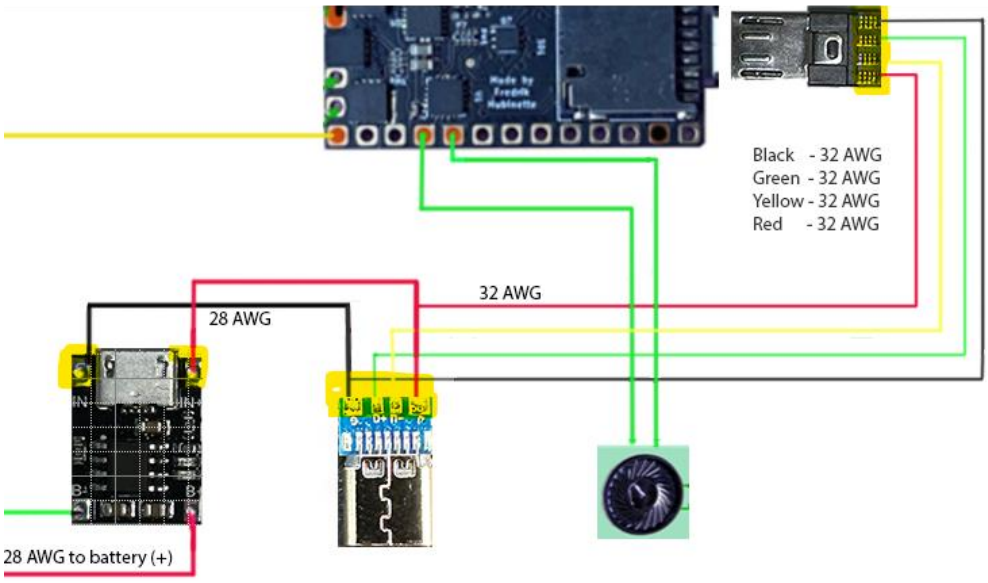
Follow these steps if you purchased the USB-C version of this chassis. Disregard this section if you chose the RCP version.

5.1 USB-C Wiring

Important note: The USB-C port needs to be installed before the kill key switch.

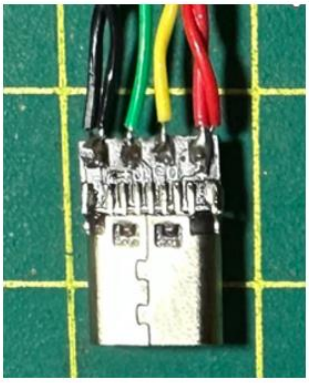
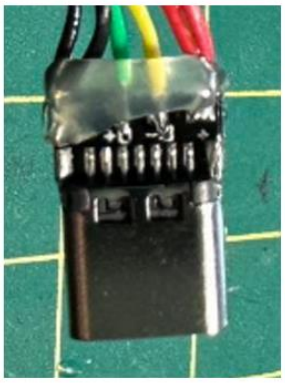
1- We start off with extra-long (250mm) lengths of the following wires within thin heat-shrink tubes (which are detailed in the below wiring diagram):
   a. Black, green, yellow and red 32 AWG wires (which go from the MicroSD plug to the USB-C plug).
   b. Red and black 28 AWG wires (which go from the USB-C plug to the square USB-C charging PCB).





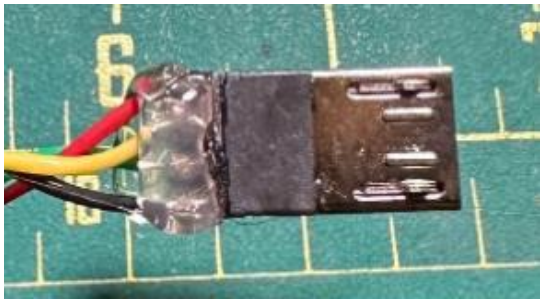
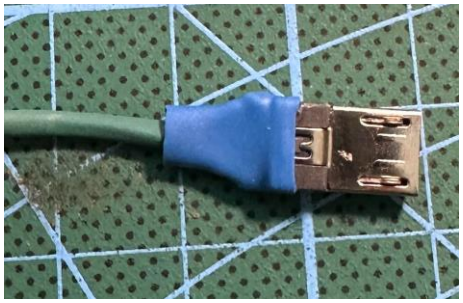
* The full suggested wiring diagram can be seen in section 12 of this document.

2- Solder the wires to the proper pads of the USB-C port as seen in the above wiring diagram, taking note of the combined red and black wires).
3- Before applying the final heat shrink tubing (as seen in red in the third image below), apply a (thin) bead of hot glue to the pads of the newly soldered connections to protect them from breaking when the wires are bent.

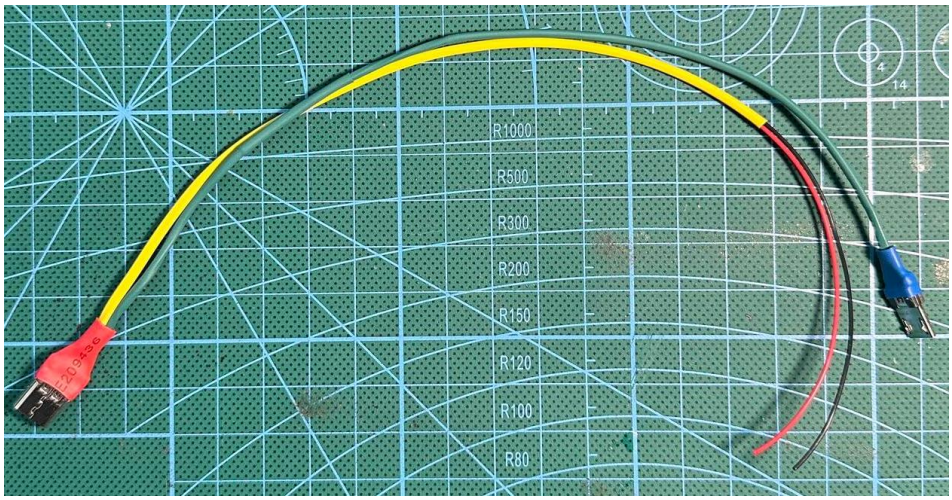




5.2 Micro SD Port Wiring

Next, solder the other end of the 32 AWG (black, green, yellow and red) data wire harness (from the USB-C plug) to the appropriate pads on the Micro SD plug. Just as with the USB-C plug, apply a thin bead of hot glue to the pads of the newly soldered connections to protect them from breaking when the wires are bent. Apply heat shrink tubing thereafter.

This is how the USB-C / Micro SD harness should look when completed:

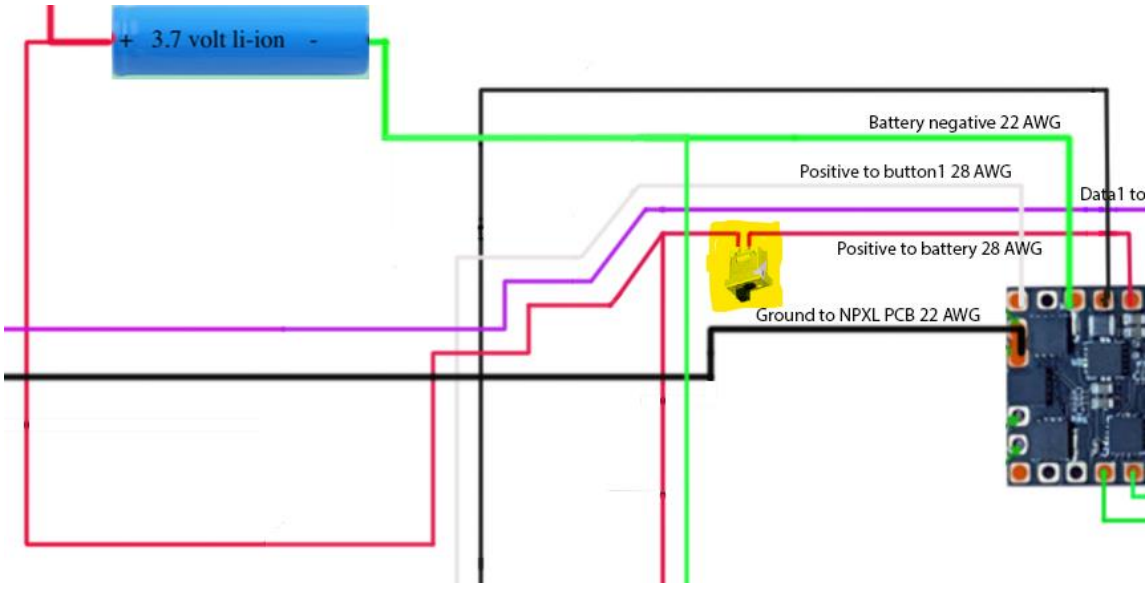


In a later step, the above harnesses will be routed through the wire channel within the chassis to the ProffieBoard area of the chassis. The red and black 28 AWG wires will be soldered to the USB-C charging PCB as seen in the main wiring diagram in section 12 of this document. From there the USB-C charging PCB will be situated into the below section of the chassis.

4- Important! Test fitment before attempting to insert the wired USB-C plug into the chassis:
   a. It is recommended to do this using a "test" USB-C plug held by pliers (using a test plug which will not be used in an actual chassis as it may become damaged by the pliers). This is needed as the initial insertion of the USB-C plug can be tight due to 3D printing tolerances. After a slight bit of gentle pressure, the test plug will manage to go in nicely and will scrape some material out in the process, in essence "preparing" the slot for the actual wired plug. Noting In some cases a light amount of scraping with an exacto blade may be required.
   b. Once the above step is completed the actual USB-C plug will fit snugly.
   c. In most cases the USB-C plug will not be required to be glued into place as it's designed to be press-fit. If glue is required, do not do so until after ALL the components of the entire chassis are installed and tested.

5.3 Kill Key Switch

The kill key switch is wired between the ProffieBoard and the Battery (+). The full wiring diagram can be seen in section 12 of this document.



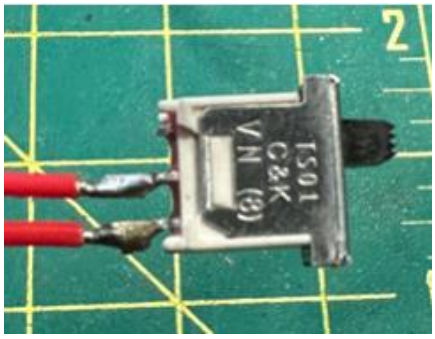
* The full suggested wiring diagram can be seen in section 12 of this document.

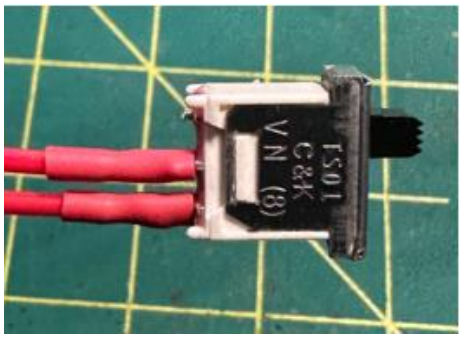
There are three connector pins on the kill key switch:

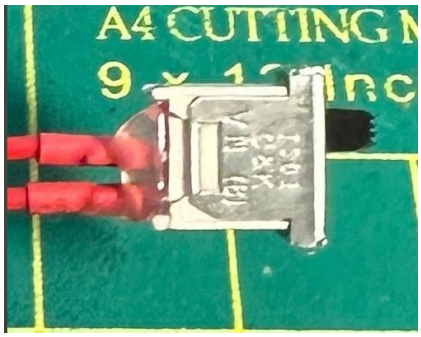
- The middle pin is the main connection point to (+).
- (Only) one of the remaining (left or right) pins can be used for the other (+) lead.
- Whichever pin is selected (left or right) determines which side of the switch activates power.

1- Solder the middle pin to the wire connection which goes to the (+) pad on the ProffieBoard.
2- Solder the remaining (right OR left) pin to the wire which goes to the battery (+).
3- Cut off the remaining unused pin if desired.

It is suggested to protect the exposed hot leads with small lengths of shrink tubing. It is suggested to use a small bead of hot glue over the connections to help prevent the welds from being damaged later when these wires will be bent various times during the insertion of the kill key switch into the chassis.







4- Carefully insert the kill key switch into the designated slot on the chassis.
5- In most cases the kill key switch will not be required to be glued into place as it's designed to be press-fit. If glue is required, do not do so until after ALL the components of the entire chassis are installed and tested.

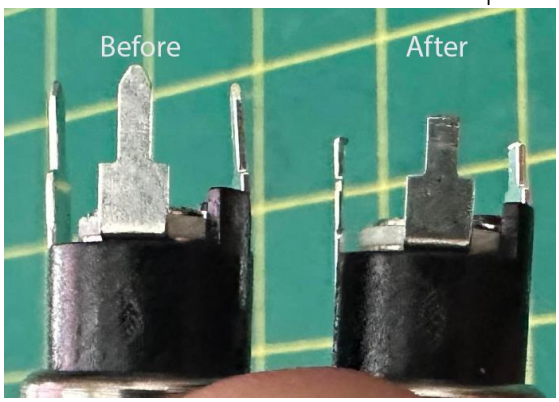
6 RCP Version - Recharge Port Installation

Follow these steps if you purchased the RCP version of this chassis.

Note: Be sure to install the RCP BEFORE installing the PWR/AUX tactile switches as seen below.

6.1 Preparation

- Trim the tabs on the RCP a little to save space within the chassis:



- Test-fit the RCP in each of the two chassis in the set.

6.2 Wiring and Installation

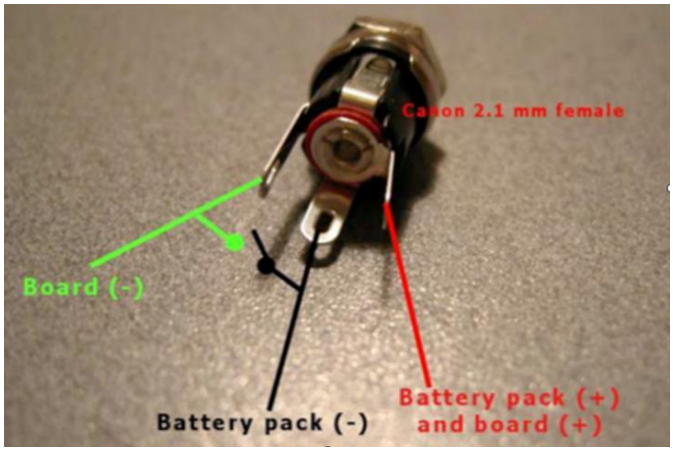
1- Solder the leads followed with heat shrink tubing as seen below:

Wire the RCP as seen follows:

- Two RED 28 AWG wires to the (+) tab (braided together).
  One will later be connected to the (+) on the battery sled (which will be directly next to the ProffieBoard area of the chassis) and the other will be later connected to the BATT (+) pad on the ProffieBoard.

Wire one each of the following:

- BLACK 22 AWG wire (short wire) will later connect to the (-) on the battery sled.
- GREEN 22 AWG wire (long wire) will later connect to the BATT (-) on the ProffieBoard.



2- Implement heat shrink tubing once completed.
Note: The direction of the wire bend seen below is important as this provides better wire management later on during the install:

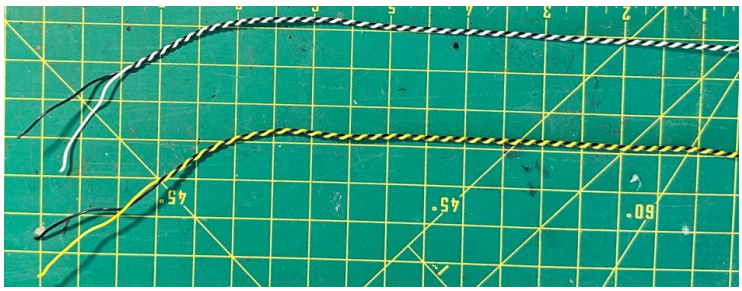
- Route the wires through the wire channel (see red arrows in below image) and then press the RCP itself into the dedicated opening in the chassis until it is fully seated. Thread the washer and nut onto the RCP.
- Use hobby tweezers to carefully tighten down the nut onto the threads of the RCP until snug. It does not need to be overly tightened.

7 Power and Auxiliary Tactile Buttons

Note: Be sure to install the PWR/AUX tactile switches AFTER installing the RCP as seen in the previous section.

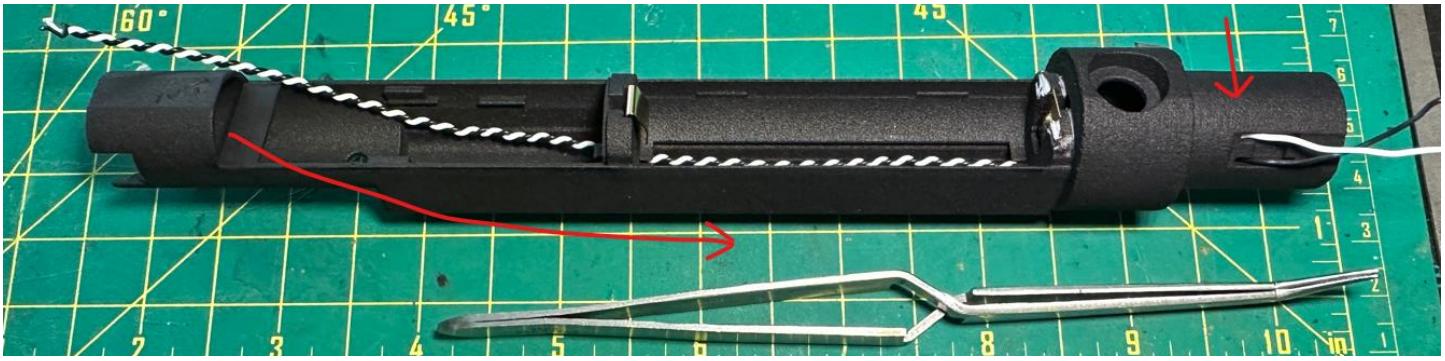
7.1 Wire Preparations

- Braid the 28 AWG (white and black) PWR and AUX (yellow and black) wires which will be soldered to the tactile switches in the next section. Straiten the last 60mm of each wire from the braid as they will need to be pushed through holes in chassis during a later step:



- Do the same as above for a length of 28 AWG white and green speaker wire long enough to go from the ProffieBoard to the speaker-end of the chassis (and always, include enough extra slack to replace the speaker in the future if it goes bad).

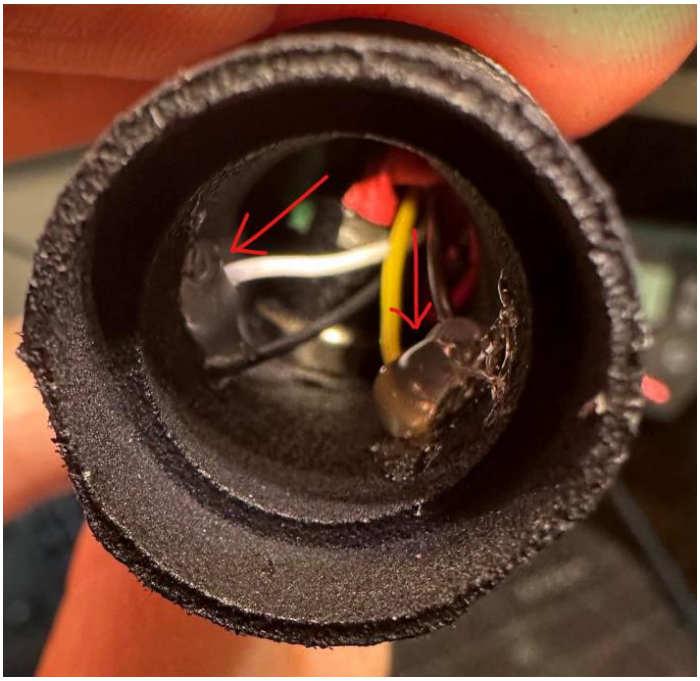
Orient the straitened ends toward emitter side, then run the braided 28 AWG (white and black) PWR wires through the wire channel and over to the ProffieBoard area as seen below. Then push the strait ends of the white and black wires through the holes for the PWR tactile switch depression:



Do the same for the braided 28 AWG (yellow and black) AUX wires. Solder the tactile switches for the PWR and AUX switches as follows:

Solder the 28 AWG **BLACK** and WHITE wire onto the prongs on the PWR switch, and then the 28 AWG **BLACK** and YELLOW wire onto the AUX switch.

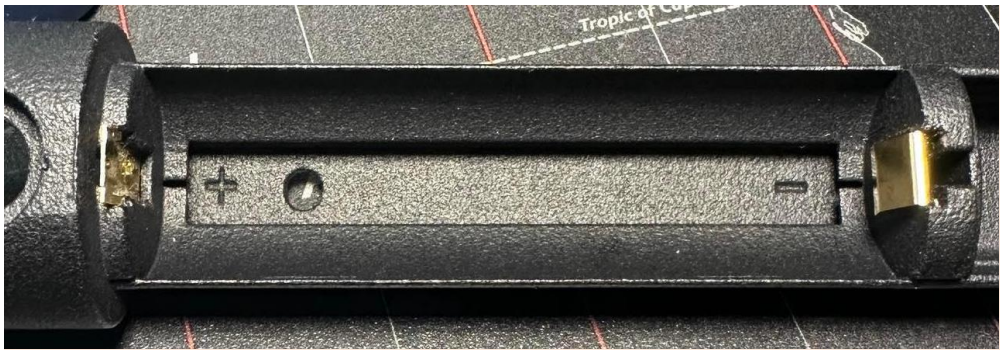
- After soldering is complete, secure the tactile switches into the depression using a *very* small dab of e6000 glue and carefully press the switches into the holder. Allow the glue to fully dry.
- Once the glue has cured, come back and secure the wire connections on the inner side of the chassis with a *very small* dab of hot glue. This prevents the welds from weakening during manipulation of the wires during the remainder of the install process. **Warning:** Using too much glue here will cause fitment issues for the NPXL wires which need to route through this area next!



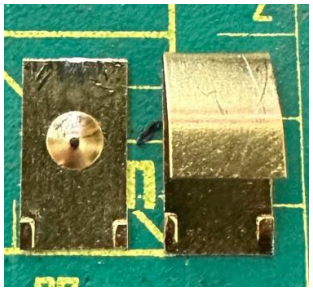
8 Battery Sled Positive and Negative Post Installation

8.1 Preparations

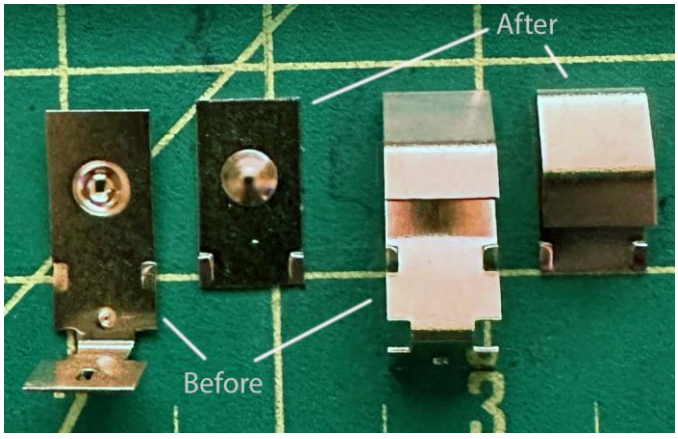
Be sure to study the wiring diagram at the bottom of this document to become completely familiar with the battery sled wire locations. The 18650 battery sled is built into the chassis and the positive and negative sides are stamped into the sides and bottom of the battery sled for your convenience as seen below.



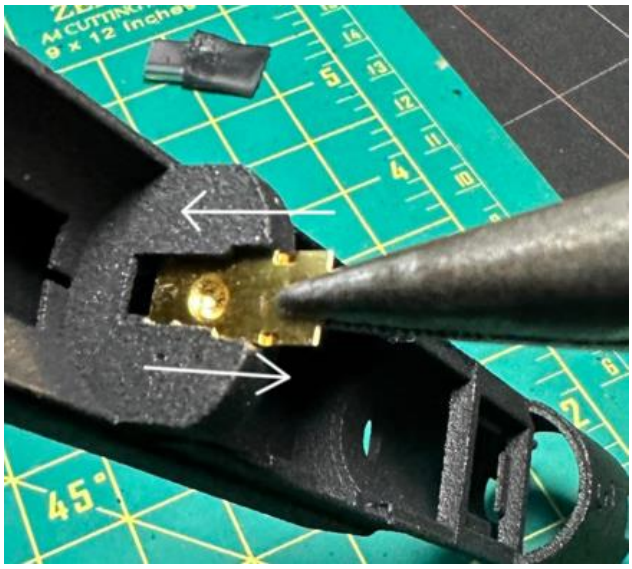
- The metal (+) and (-) battery posts included with this kit will arrive pre-cut and ready for your install:



- Shapeways customers (who purchased their metal posts from Digi-Key) will need to cut off the metal tabs on the bottom of the metal (+) and (-) battery posts at the exact length as follows:
    - Using tin snips, trim the provided (+) and (-) metal battery tabs as seen below for proper fitment into the chassis set. Be sure to cut the tabs in the locations seen below (and in the above image):

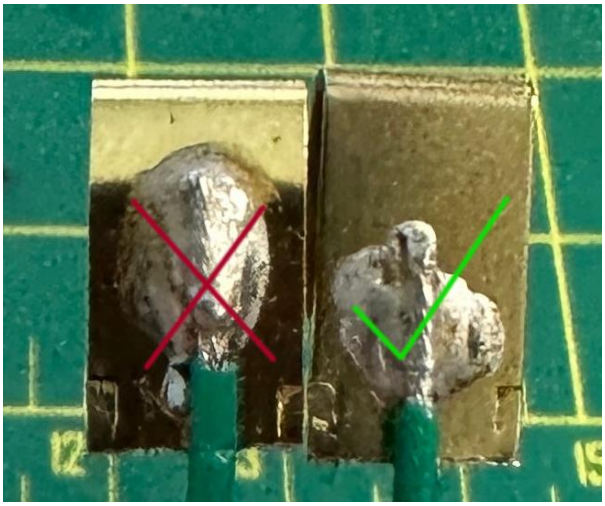


1- Prepare both the (+) and (-) battery tab slots by carefully pressing in one of the metal tabs (with pliers). Use an in and out motion until the tab can be inserted completely (but still snugly). This process actually "shaves" off any excess SLS material layers to allow the final (wired) metal tabs to be inserted completely in the next section. Be sure to insert the TOP of the metal tab as seen in the image below (the top is the opposite end of the tab you will be inserting later).
Note: Be extra careful not to overdo this process or the (+) on your battery may not make solid connection to the metal (+) battery tab in the built-in 18650 battery sled.



8.2 Battery Post Installation

1- Tin the backs of the (+) and (-) metal battery tabs and then solder the connections as seen in the wiring diagram. Do NOT over-solder these connections or the tabs will not fit into the slots within the battery sled! Example:



2- Carefully press the wired metal tabs into the corresponding slots in the built-in 18650 battery holder until they stop. Be sure to properly route the wires during this step.

9 Shtok NPXL PCBs (Version V3 setup)

Disclaimer: As with all components, be sure to reference, study and understand the owner's manual from the PCB vendor.

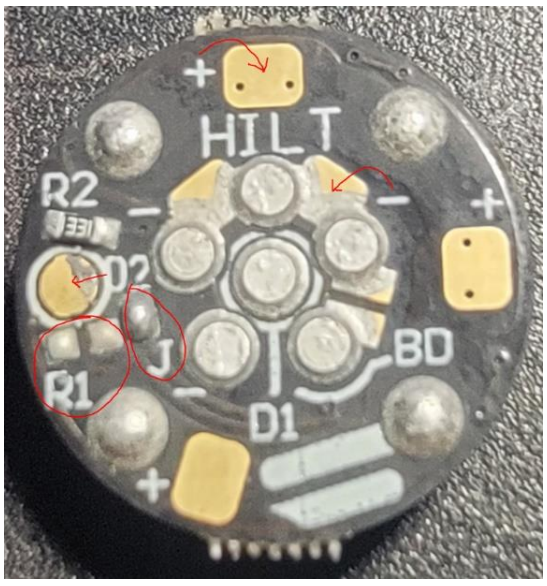
9.1 Prepare the NPXL PCBs

- Carefully sand the outer edges of the NPXL PCB unit to verify fitment into the emitter side of the chassis.
- If you did not purchase assembled NPXL PCBs, you will need to solder the pins onto the PCBs.
- Test-fit the NPXL PCB again (this time with the clear PCB lens on) into the emitter end of the chassis. The PCB should stop solidly at the thin raised inner ring which keeps the PCB at the correct placement. - Carefully push the PCB back out (using wood dowel or eraser side of a pencil). Be sure to remove the plastic lens from the PCBs before the next steps of soldering on the wires.

Soldering warning from the PCB vendor (links below):
WARNING! DON'T OVERHEAT THE PCB WHEN SOLDERING!

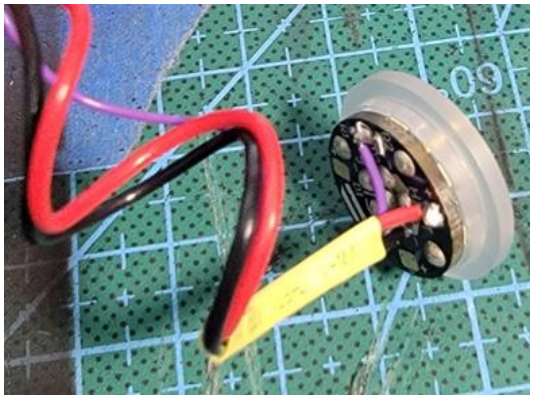
- When soldering pins to the Pixel blade connector, make sure to not overheat the PCB, as this will damage pixels.
- Use the following SHTOK V3 configuration:
    - Leave the on-board 330-ohm resistor in place on R2.
    - Bridge the J pad.
    - Remove the resistor on the R1 pad.

Finished examples:



- Solder the required wires to the proper pads on the bottom of the NPXL PCB (as seen in the wiring diagram at the bottom of this document).
- Clean off the PCB with an appropriate PCB cleaner to remove residual flux before proceeding. We use WD-40 Specialist electrical contact cleaner spray and lightly brush around the soldered pads with a light bristle toothbrush.
- Carefully attach the plastic lens cover to the PCB.

- Form the NPXL PCB wires into a “spring” (by tightly wrapping the wires around a paint brush handle) as seen below. This will allow slack in the wires and ease of removal if you ever need to replace the NPXL PCB:



- Carefully push the NPXL into place into the emitter for a final test fit, and (optionally) use a paint brush handle to push the emitter back out.
  Note: Be careful not to damage the weld points on the NPXL PCB when pushing it back out! Also, it is suggested the emitter should not be put back into place until after the ProffieBoard wiring is completed at the end of the installation process.

10 Speakers (20mm version)

10.1 Preparations

Use the (previously prepared) braided length of 28 AWG GREEN and WHITE which should be long enough to go from the speaker-end of the chassis past the ProffieBoard area.

- White for positive (+).
- Green for negative (-).

Use a razor to remove any tabs or imperfections which could interfere with a nice flat fit of the speaker against the chassis.

10.2 Speaker Wiring and Installation

- Solder the green wire to the post with the red mark (+) and white wire to the (-) post.
- Route the braided speaker wire pair over to the ProffieBoard area.
- Secure the speaker into the end of the chassis with a small bead of gap-filling super glue, e6000 glue, (or hot glue).

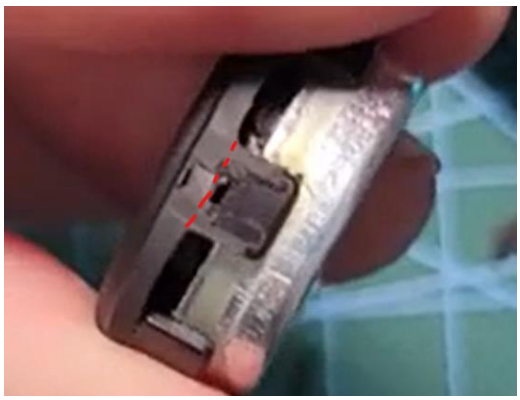
11 Speaker Pod (28mm version)

This section is only applicable for those using the 28mm speaker pod parts upgrade.

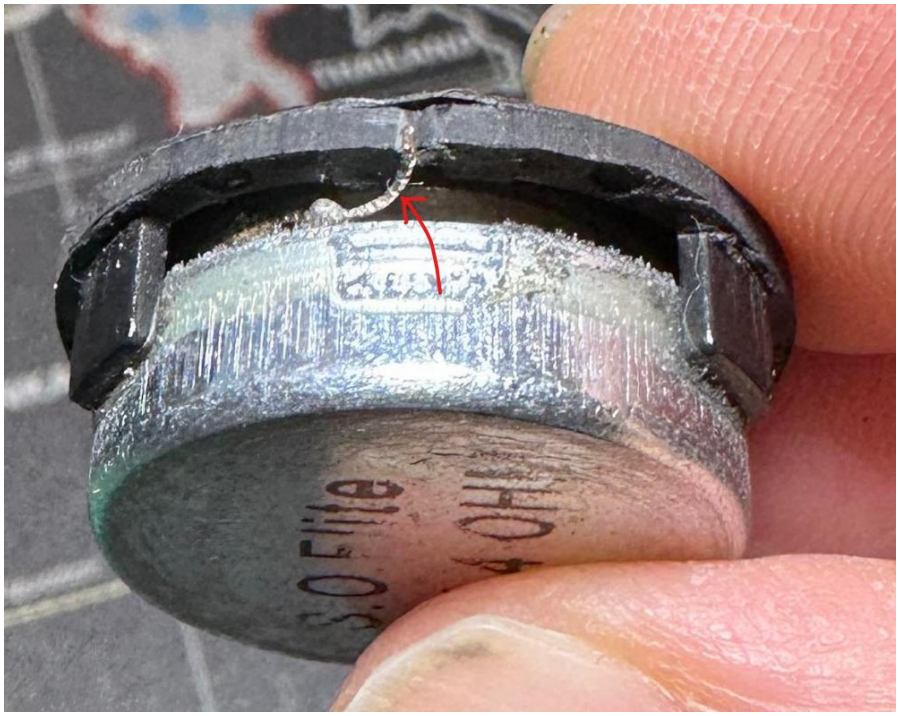
28mm speakers – Using 28mm speakers will require the following modifications to fit within the Project O1 hilt:

1- Using a belt sander, shave the plastic outer diameter of the of the speaker down to approximately 24.9mm. Once done clear off any melted plastic "flash" with an exacto blade. WARNING: Be especially careful not to sand too close to the diaphragm of the speaker, doing so will cause permanent damage to the speaker.

2- Remove metal (+) and (-) posts (at this point they might have already fallen off during the sanding of the outer diameter of the speaker). From there cut off the plastic tabs in which held these posts. A hobby saw works well for this task. Be sure to leave the remaining 4 posts untouched.



This is how it should look when completed, noting the wire lead (seen with the red arrow below). There will be one of these leads on each side of the speaker, which will be used to solder the (+) and (-) speaker wires to:

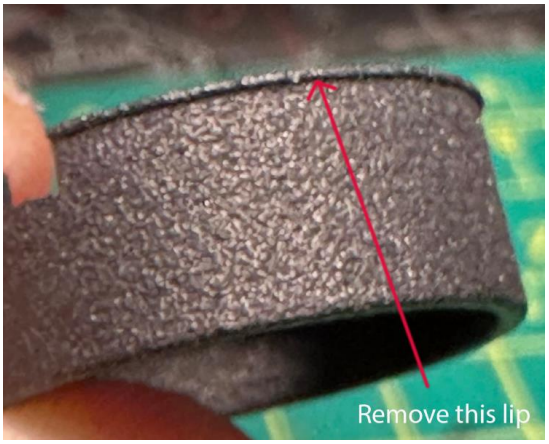


3- Using a dremmel cutting wheel, carefully cut out a notch along the both sides where the (+) and (-) speaker wires come out down as seen below (be sure not to cut through the metal housing). This required to allow a channel for the speaker wires to reside when the pod is inserted into the hilt.

11.1 Speaker Pod Wiring and Installation

Note: For a perfect press fit of the speaker PCB, you may have to lightly sand the outer edge of the PCB (NOT the SLS speaker pod). Be sure to test fit this part into the pod and then sand the PCB as needed for proper fitment before starting.

1- There might be a thin line of flash on one side of the SLS speaker pod as seen in the below images. If so, this flash will need to be removed (the below images show this lip from two different angles). If not removed, this lip will impede fitment of the speaker pod into the hilt.

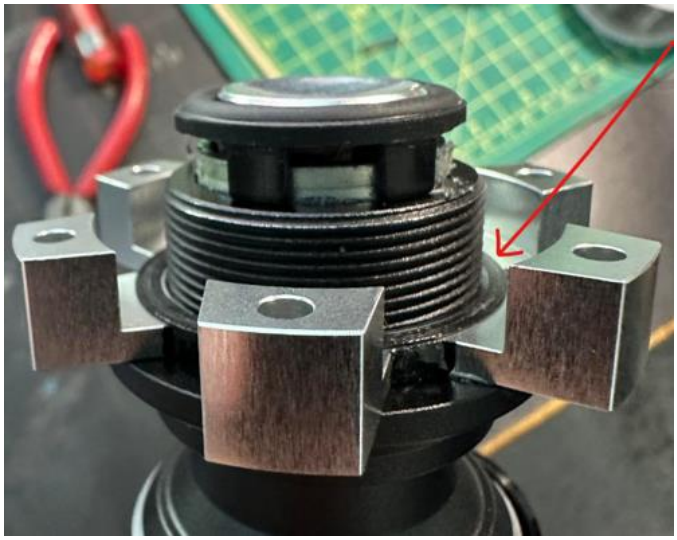


2- Wire the speaker wires from the ProffieBoard to the pogo-pin PCB and then press the pogo PCB into the chassis-side PCB holder. We wire the (+) white wire to the pin which resides in the center. Secure in place with a drop of hot glue.

3- Wire the speaker leads to the circular speaker-pod PCB again with (+) going to the center pad. Insert the PCB in place within the speaker pod, then carefully secure the speaker (centered) onto to the pod using hot glue.

11.2 Required Pommel Cap gasket

The pommel-cap gasket is needed to provide proper closure fitment of the pommel cap against the hilt and should be placed in the area seen below:



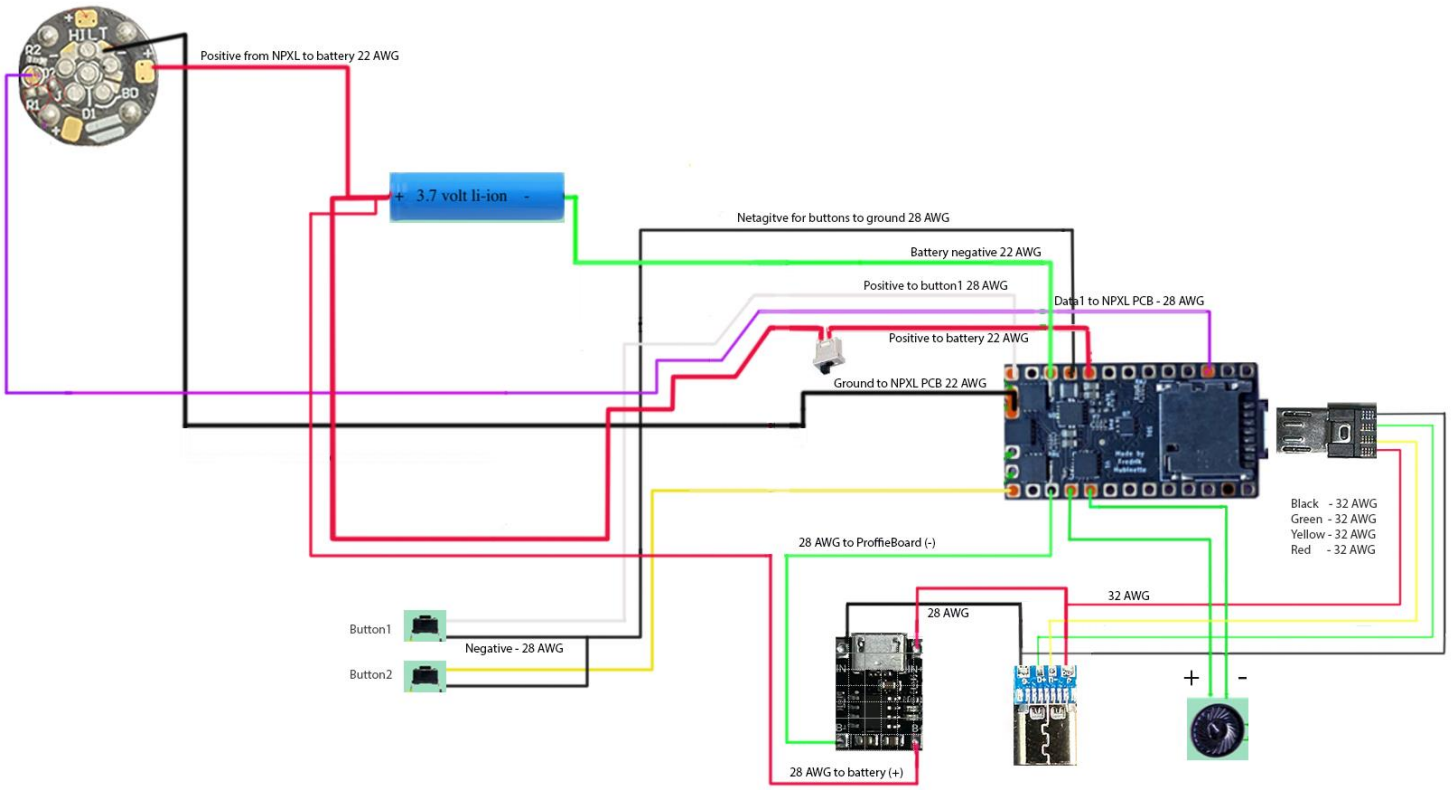
12 ProffieBoard Install and Wiring

12.1 Suggested Wiring Diagram

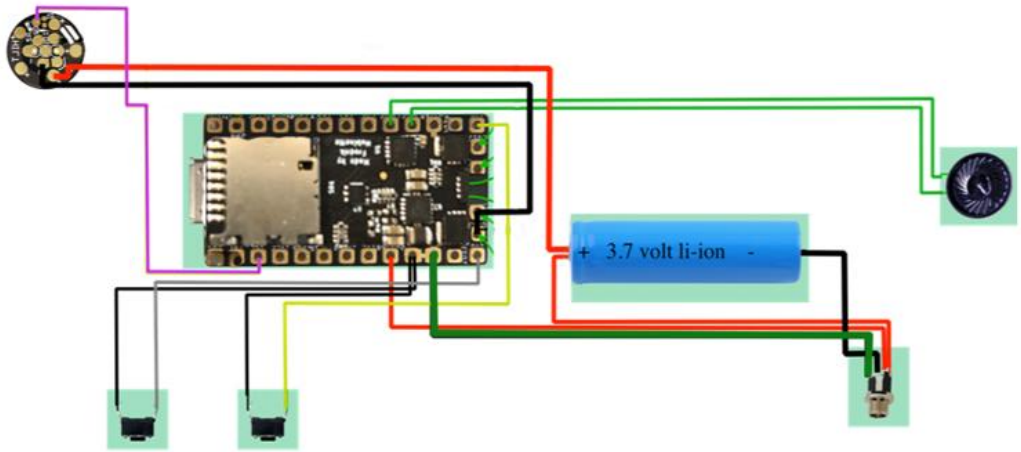
Important note: Wire gauges in this diagram are suggested based on common installation specifications. Please refer to the wire size chart to determine the proper gauge required for each component specific to your installation.

Zoom in by expanding this document for better detail within the wiring diagrams below.

USB-C version

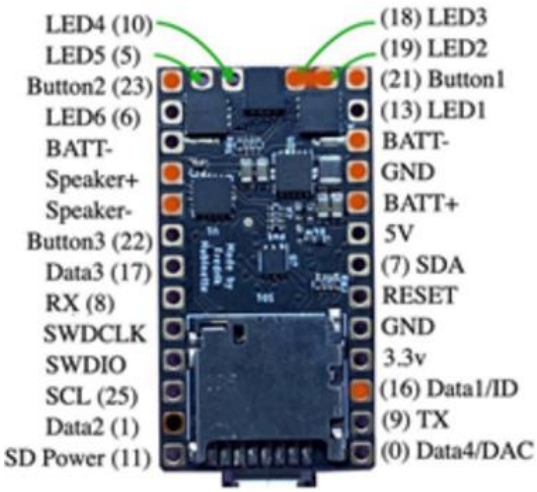


RCP Version



12.2 ProffieBoard Pads

Connect the wires to the under-side as seen below. Remember to bridge LED 2 and 3 as seen in the above diagram.



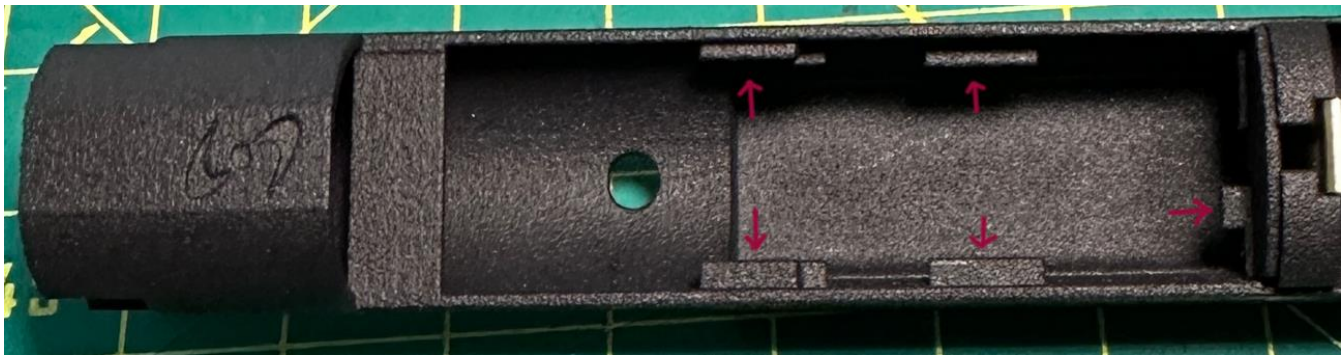
Note: As always, be sure to be completely read and be completely familiar with the vendor's documentation.

12.3 ProffieBoard Install

Once you have completed soldering all the connections to the ProffieBoard (for each of the two chassis in this set), you will need to firmly press the 4 corners of the proffie to seat fully into place.

Steps:

- Make sure you have NOT yet inserted the battery into the chassis!
- Be sure none of the wires are interfering with the support tabs (in which the ProffieBoard will reside on). Push these wires under or otherwise out of the way of these tabs:



- Firmly but carefully press the ProffieBoard into the proffie holder until it snaps into place, (you may have to use a little pressure to get it to seat all the way, be careful not to damage the chassis during this process).
- Visually inspect the board to ensure all corners have seated correctly. If it does not seat properly it could indicate there could be a wire resting on one of the support tabs (or you did not sand the ribbed areas along the sides of the ProffieBoard smooth).
- Before proceeding further we always recommend cleaning the ProffieBoard one last time to ensure all traces of any oils (from the handling process in the previous steps) are removed. This can be (very carefully) done by applying a

small amount of "WD-40 Specialist electrical contact cleaner" to a toothbrush and then gently brushing the top of the ProffieBoard. Do NOT spray this product onto the ProffieBoard while it is installed in the chassis as it can discolor some 3D printed materials. Be SURE to wait a proper amount of time to allow all of the cleaner completely dry BEFORE proceeding to the next steps. We recommend an hour just to be safe. DO NOT use standard "WD-40"!! Only use "WD-40 Specialist electrical contact cleaner".

- Now that the board is properly seated (and clean) it is safe to insert the SD card (containing your fonts) followed by the battery. Note: Do NOT apply any glue just yet, it is best to test the board first and then come back later to glue the ProffieBoard into place after testing.
- Upload your configs to the ProffieBoard. (Follow the vendor user-guide for the correct programming method including uploading your font folders to the SD cards).
- After successfully uploading the configuration, test the functions by CAREFULLY turning on the chassis.

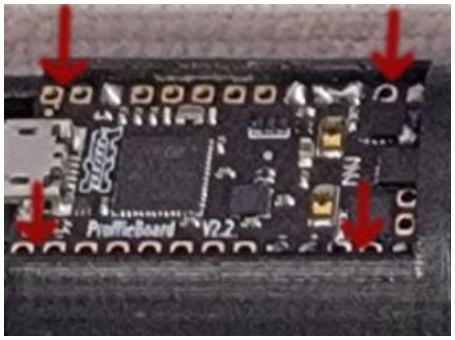
IMPORTANT NOTES:

- Be SURE not to touch the ProffieBoard or any wires while testing!
- NEVER attempt to test a NPXL blade with the chassis outside of the hilt, doing so will short out and destroy the ProffieBoard when the pins misalign!!

- Verify the following:
    - LEDs on the emitter light up.
    - PWR/AUX button functions work as expected.

Once the above testing is completed, perform the following steps for the final task of gluing the ProffieBoard into the chassis:

- Insert the kill key and remove the battery.
- Using a very thin rod or brush, apply a very light amount of gap-filling super glue (at the 4 corners of the board, where the rim of the chassis meets the board). It is suggested not to glue the entire area board and just add a dab in these four sections:



- The gap-filling super glue (in combination with the tight press-fit design of this component) fully secures the board within the chassis AND allows the benefit of removing the board from the chassis later if needed (without damaging the chassis).

Important battery suggestions:

Before inserting batteries inspect parts to ensure they are secured properly in place and if not apply additional gap-filling CA glue where needed:

- Do not over-glue these parts, use a minimal (just enough) amount to secure the parts in place, which provides the ability for you to remove them later if needed.
- A reminder it is not always necessary to glue in the NPXL PCB (as long as it press-fits into place).

13 Power and Auxiliary Buttons

13.1 Adjusting and Securing the Buttons

The screw seen under the PWR and AUX buttons acts as a “plunger” and will need to be adjusted by turning the screw (a specific number of turns) to set the screw plunger at the optimal distance above the tactile switches on the chassis.

Once you have found the best position for optimal button presses it is important to secure the plunger screw in place as otherwise it will loosen over time which causes the plunger screw to no longer properly depress the tactile switches on the chassis in the hilt. We recommend using the (removable grade) of Loctite 222 purple as it is not permanent and will securely keep your plunger screw from loosening up over time and usage. Do NOT to glue the buttons to your hilt!

13.2 Power and Auxiliary Button Shims

Power and auxiliary button shims are included with this chassis kit. They may or may not be needed (for optimal crisp button presses) depending on the manufacturing tolerances of each Project O1 hilt. They look nice either way:

14 Important – Chassis Insertion and Removal Instructions

It is especially important to follow these instructions, otherwise you could damage the chassis:

The below instructions can also be seen in the following YouTube video:

https://www.youtube.com/watch?v=X7rOy6Z_62E

Video link from Saberz.com will be available soon.

IMPORTANT! This chassis has delicate areas (due to its required geometry to fit within the small inner diameter of the hilt). Be extremely careful when pulling out the battery as you can otherwise damage the chassis!

Remember to always be careful handling the chassis when it is outside of the hilt. The pogo pins are especially delicate, and you could short out the ProffieBoard by touching it with your fingers when the kill key is not inserted.

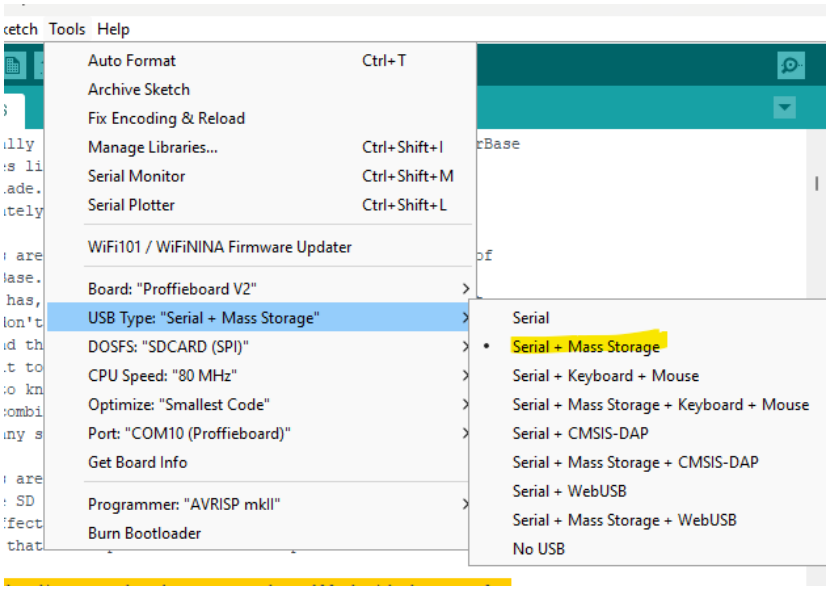
Also remember never to touch your ProffieBoard as the oils from your fingers could short out the board next time you power it on!

15 Post-Install

15.1 USB-C ProffieBoard Mass Storage Device Settings

For Windows to see an SD card being used in a USB-C ProffieBoard setup do the following:

1- Connect the ProffieBoard to the PC with the USB-C cable.
2- Open Arduino.
3- Go to Tools > USC Type "Serial + Mass Storage", then select Serial + Mass Storage
4- Perform an upload of the configs to the ProffieBoard.
5- Thereafter you should be able to browse to the SD card files and folders and upload font data, wav files etc…



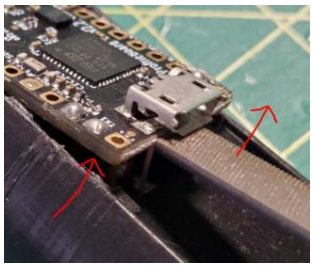
15.2 Important Reminders

- Allow all PCBs to be dry and free of PCB cleaner before installing your SD card and batteries.
- Always use the kill key (or kill key switch) before inserting or removing batteries.
- Always remove the batteries before performing any repairs to your electronic parts.
- Always be mindful and aware the NPXL PCB pins are very delicate, handle the chassis with great care when out of the hilt!
- It NOT RECOMMENDED to power on a chassis outside of the hilt. Handling the chassis while powered on outside of the hilt with the ProffieBoard (and other electronics) exposed can cause shorts which will destroy the unit.
  Be extremely careful when inserting batteries back into the chassis. Always be sure the positive (+) and negative (-) on the battery match to the correct posts in the battery sled.
- NPXL Blades – The 7/8 blade itself should not require any sanding to fit into the hilt however the blade-side NPXL PCB holder will need a light sanding to fit, as seen in the below YouTube video:
  https://www.youtube.com/watch?v=OAIbxdja2_M

15.3 Example ProffieBoard Removal Process

In the event of ProffieBoard hardware failure (or the like), the following steps outline how to remove the ProffieBoard from the chassis:

1- Insert the kill key and then remove the battery and SD card.
2- Carefully run an Exacto blade along the areas where superglue was previously applied to the board. Do this several times, until the glue seal is broken:

3- Carefully (but firmly push) the ProffieBoard upwards as seen above (if the board does not budge run the blade along the glued areas again):

Important! There is always risk of damaging a board (or the chassis) when removing them from a chassis, especially if the installer over-glues these parts in place. We have not had any damage to any of our ProffieBoards which were removed using this procedure. If you take your time and are extremely careful you should be able to avoid any damages.
We use a flat file for this purpose. It may take some pressure to pop the board out of the holder.

NOTE - be sure NOT to damage the SD card slot! The file should be applied just on the edge of the board, and not resting against or touching the actual SD card slot.

We hope you truly enjoy this chassis as much as we do.

As always. please feel completely free to contact us if you have any questions on the content of this document or anything regarding the install process of these parts for your saber. We are always happy to help!