Saberz Project Q Chassis Installation Guide

Version 2.4 – January 2024

Contents

# 1 Disclaimer and Important Starting Notes

Disclaimer

- This chassis kit is provided strictly as a DYI ("do it yourself") installation. This install is complicated, somewhat difficult and requires an expert-level installer.
- The installation of electrical components - It is assumed you, as the installer, have experience with soldering, wiring and proper handling of electronics and follow all safety protocols.
- Perform your chassis electronics installation 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, NPXL etc).. documents from the product vendors.
- 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!
- Exact instructions for soldering the wires to your ProffieBoard are not provided, only the wiring diagram we used for our installs is included.
- Never use a heat gun anywhere near this chassis set as all 3D printed parts are extremely sensitive to heat.
- Please use caution when doing your install! We are not responsible for any damage done to your chassis set (and/or hilt) by you or your installer during the installation 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 to support future servicing of electrical components which can go bad. Using just a small amount of gap filling type superglue (or hot glue) 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 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.

2 Chassis Components

The Saberz Project Q chassis set supports 24mm or 28mm* speakers:
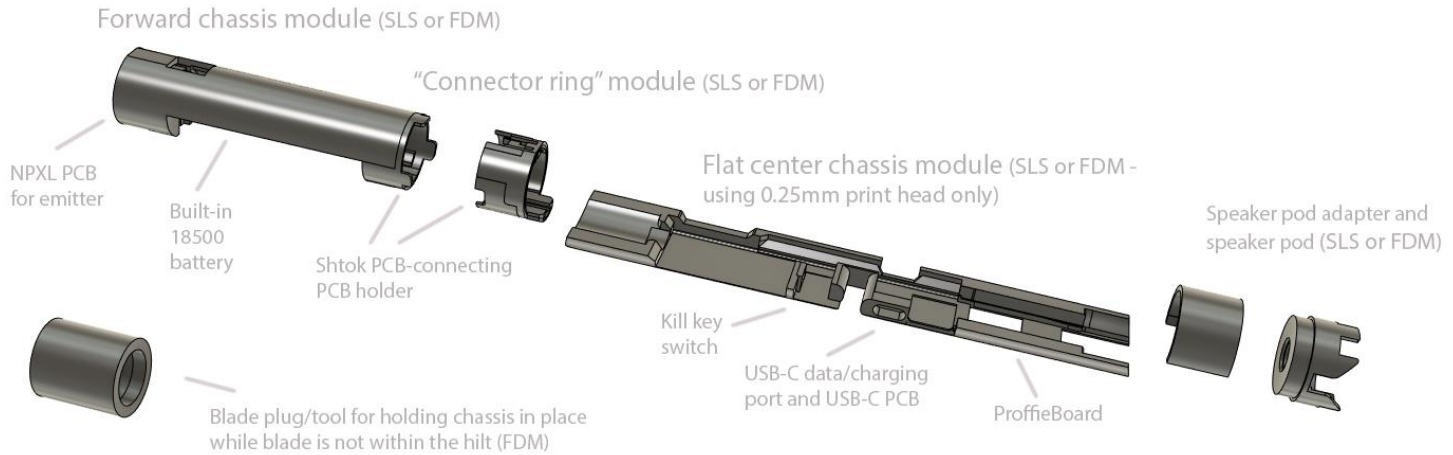

2.1 Supported Features

- ProffieBoard v2.2 - this document was written using (and teste) with version 2.2.
- Designed for 18500 batteries and built-in battery sled for fully removable battery.
- Remove the CoverTec wheel, pommel cap and the outer aluminum shroud to access the USB-C data/charging port.
- This chassis set is designed specifically for 24mm or 28mm* Elite Smuggler's Outpost (or TCSS 4W 28mm WOW) speakers.
- USB-C data/charging port.
- Shtok V3 NPXL connectors
- Supports 7/8 NPXL blades.

    * Note for using a 28mm speaker: This installation requires modifications to the 28mm speaker as seen in section 10 of this document.

2.2 Included Chassis Set Parts

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

- Emitter-side forward chassis module with built-in 18500 battery holder
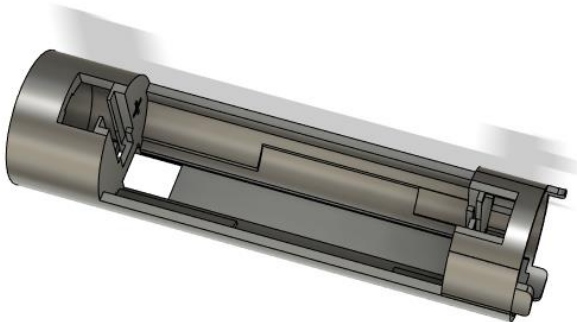
- Connector ring

- Center (flat) chassis
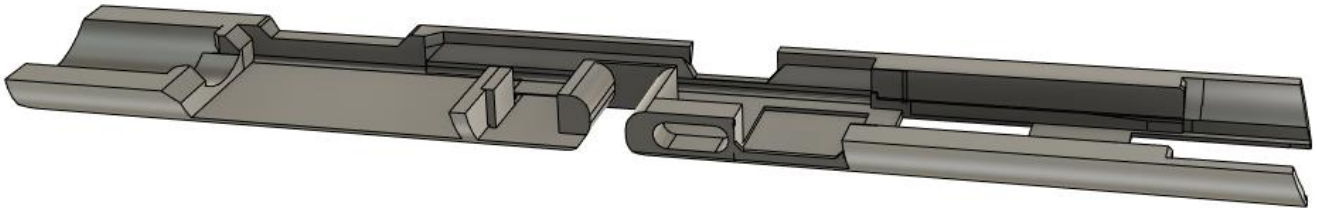
- Speaker pogo-pin holder
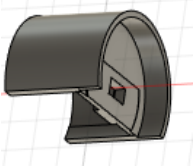
- Speaker PCB pod

- Blade plug/tool for holding chassis in place while blade is not within the hilt:

*Note: This blade plug is not designed to be a screen accurate art and is only offered as a tool to hold the emitter-side chassis in place within the aluminum hilt. When in place, this part applies the required pressure to secure the electrical connection between the Shtok chassis-connecting PCBs located on the emitter-side chassis and the corresponding chassis-connecting PCB on the center "ring" chassis.

- Metal (+) and (-) tabs for the built-in 18500 battery sled – These are included and will arrive pre-cut and ready for your install:
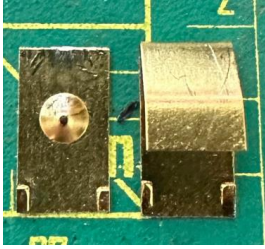
If you lose or damage your metal tabs they can be purchased from Digi-Key:

Negative
Positive

When purchasing replacement battery post tabs - the metal (+) and (-) battery posts will need to be trimmed at the exact length as follows:

- o 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 negative (-) tab in the location as seen below:
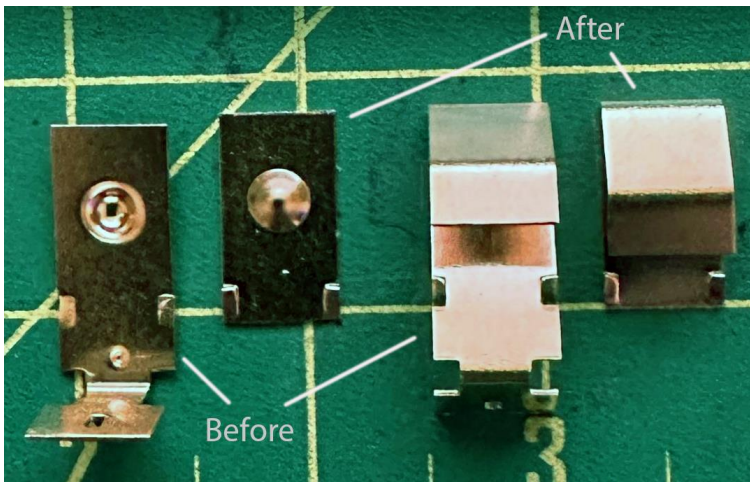
3   Required Parts

3.1   Suggested Parts List

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

- Saberz Project Q 3D-printed chassis set 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
- OR
    Short pin version (not tested)
- NPXL LED PCB Lens Cover
- Brass tactile switch This chassis set is designed for 1.7mm (0.4mm plunger height). This chassis set 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 (this chassis model was developed for the following specific speakers):
    - 24mm speakers:
        Smuggler's Outpost Elite 24mm 2w 4ohm Bass Speaker

    - 28mm speakers:
        TCSS 4W 28mm WOWSpeaker - this speaker produces excellent results within the sound resonance chamber of the Project M hilt.
        Alternate:
        Smuggler's Outpost Elite 28mm Elite 2W 4OHM Bass Speaker

    - Two-pin connector set required for the 28mm speaker pod - ShtokCustomWorx SPKR PCB 2-Pin Connector Set (this part can also be ordered directly from Dmitry as seen below):
        https://www.etsy.com/listing/1220528708/shtokcustomworx-spkr-pcb-2-pin-connector?ref=yr_purchases

Order the following from Dmitry Shtok:
- USB-C kit
- Chassis-connecting PCB kit
- Two-pin connector set required for the 28mm speaker pod (as seen above)

Important! - CoverTec wheel screw:
- Replace the existing M4x12 screw with an M4X8 size. This will prevent the CoverTec wheel screw from possibly making contact with the internal electronics.

Battery – KEEPPOWER 18500 3.7V 1500MAH HIGH DRAIN PCB PROTECTED REMOVABLE LITHIUM ION BATTERY

Glue – We have great success using a precision hot glue gun (in very small amounts) in all areas of this install which require 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).

Hot glue works very especially well for securing parts which tend to push back out due to wire contention. It can also be completely removed if used in small amounts. We use hot glue 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 data harness you will need 32 AWG wires which are available from:
KR Sabers (recommended), or alternatively from Navships on eBay.

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 is completed for 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

Some slight sanding of chassis parts areas may be required (FDM parts only). Be sure to review the below notes on test fitting all parts before starting the installation.

4.2 Before Starting

<mark>IN ADVANCE - TEST FIT ALL PARTS INTO THE CHASSIS SET</mark> - Even with the highest quality 3-D printed parts, 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 USB-C charging PCB holder area – Be sure to sand any raised edges along the USB-C board and then ensure it fits into place.
-   Test fitment of the USB-C plug into the corresponding hole in the flat chassis as outlined in section 5.4.
-   Built in battery post slots – (see preparation steps for these in section 7).
-   Test-fit the speaker into the speaker holder areas at the emitter end of the chassis.

4.3 Prepare the ProffieBoard

-   Sand off any tabs left over from manufacturing of the ProffieBoard.
-   Become familiar with how the ProffieBoard will be situated into the flat center chassis.

4.4 Prepare the NPXL PCB (Version V3 setup)

-   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 (with the clear PCB lens in place) 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 similar tool. 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:
    o Leave the on-board 330-ohm resistor in place on R2.
    o Bridge the J pad.
    o Remove the resistor on the R1 pad.
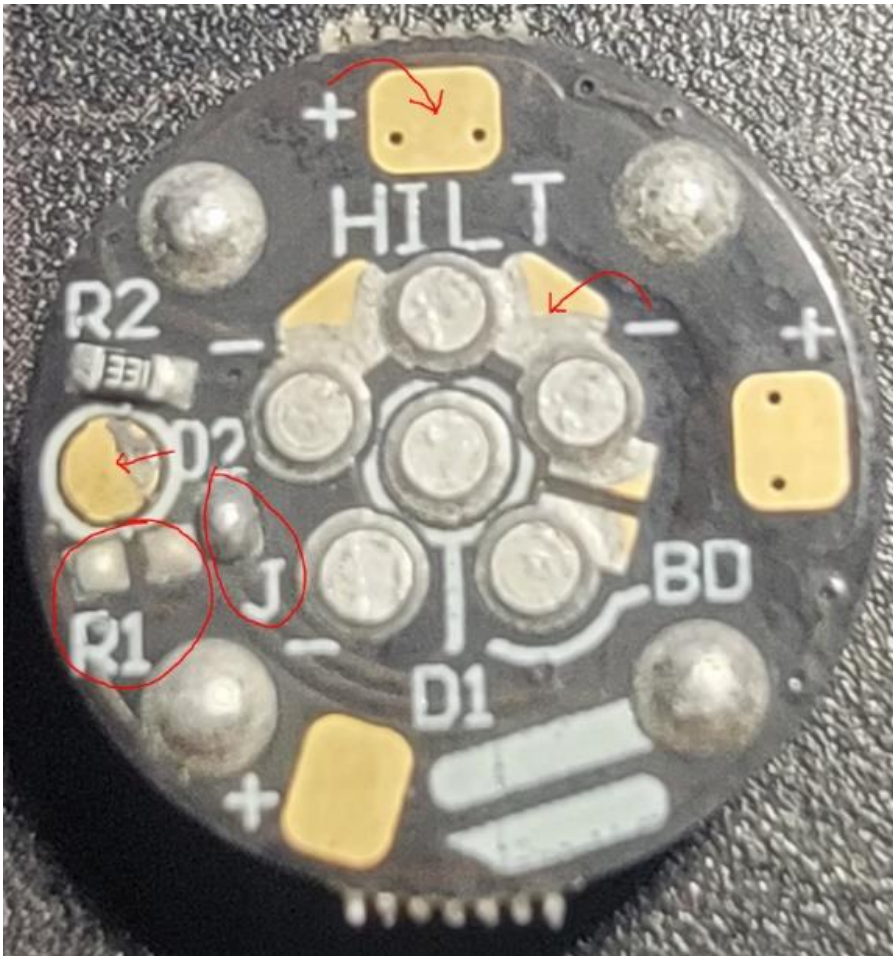
5 Pre-Wiring Steps

## 5.1 Pre-Wiring the ProffieBoard

The ProffieBoard can be pre-wired with black and green 28AWG wires underneath board, and all remaining wires above.

1- Cut an extra-long length (approx. 150mm) of the following wires:
   a. Black 22 AWG
   b. Red 22 AWG
   c. Green 22 AWG
   d. White 28 AWG (tactile PWR)
   e. White and green 28 AWG (speakers)
   f. Violet 28 AWG (data)
   g. Green 28 AWG (negative to USB-C PCB)
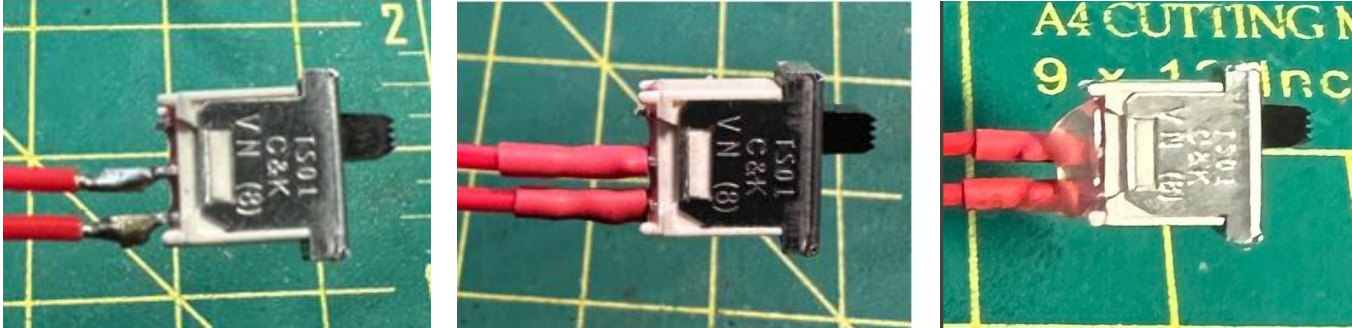
5.2 Pre-Wiring the Kill Key Switch

The Kill Key switch is wired between the ProffieBoard and the Battery (+).
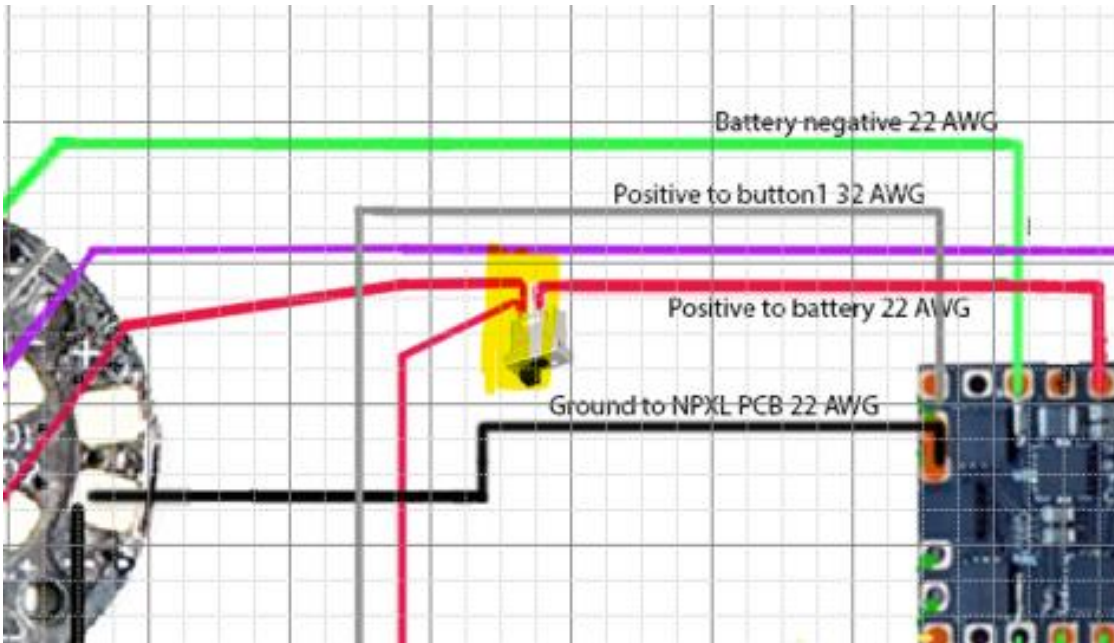
There are three connector pins on the kill key switch:

- 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- The remaining (right OR left) pin will be soldered in a later step to the wire which goes to the battery (+) as well as the positive red 28 AWG wire from the USB-C charging PCB.
3- Cut off the remaining unused pin if desired.

It is suggested to protect the exposed hot leads with small lengths of shrink tubing. An optional small bead of hot glue over the connections will help prevent the welds from being damaged later when the kill key switch is installed into the chassis.

4- The kill key switch will be glued into the flat (center) chassis in a later step.

5.3 Pre-Wiring the USB-C Connector

1- Start with three sets of wires as seen below to be used as seen in the wiring diagram:
   a. A pair each of 32 AWG (yellow/black) and 32 AWG (green/red) wires - to be soldered to the USB-C port and later connected to the MicroSD plug as seen in the wiring diagram.
   b. A pair of 28 AWG black and red wires - to go from the USB-C port to the USB-C charger PCB (third wire pair below):
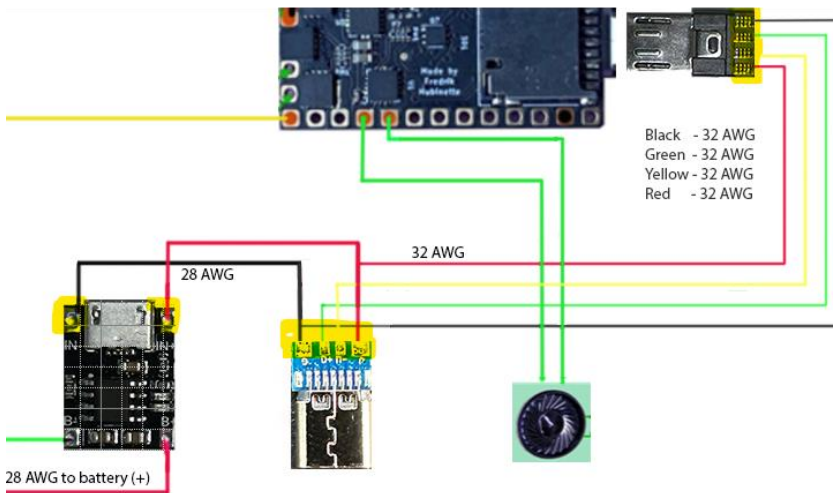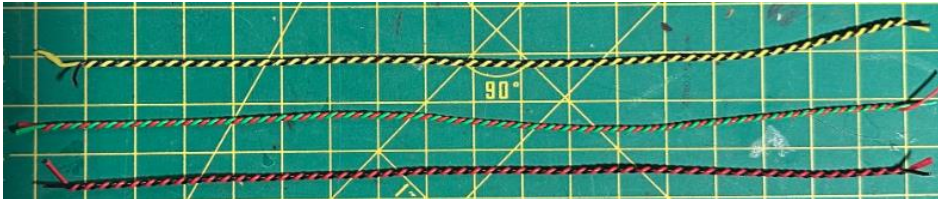
* The full suggested wiring diagram can be seen in section 12 of this document.

2- Solder the wires to the proper pads of the USB-C port as seen below, taking note of the combined red and black wires).

3- Before applying heat shrink tubing, 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.
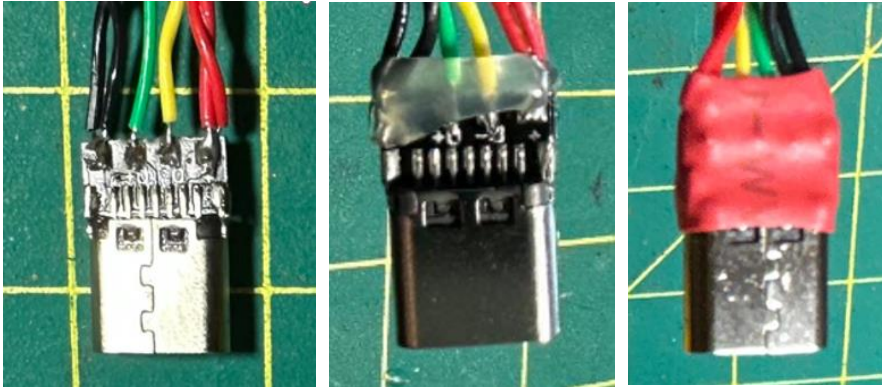

4- Important! Test fitment before attempting to insert the wired USB-C port into the chassis. It is recommended to do this using a "test" USB-C plug held by pliers (using a test plug which will not be used in an actual chassis as it may become damaged by the pliers). This is needed as the initial insertion 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.
5- Once the above step is completed the actual USB-C plug can be inserted, (in a later step).
6- 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.

5.4 Micro SD Port Wiring

The other end of the (black, green, yellow and red) 32 AWG data wires (from the USB-C plug) are to be soldered to the appropriate pads on the Micro SD connector as seen in the wiring diagram and in the below image. Just as with the USB-C connector, 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. Lastly cover the pad area with a heat shrink tube as seen below. The hot glue will re-melt inside the heat shrink tube and become evenly distributed which results in excellent prot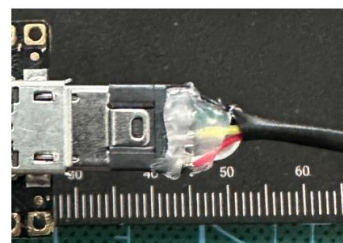ection of the soldered connections on the pads. *Please note the ProffieBoard seen in the below images is used only to hold the SD connector while soldering:*
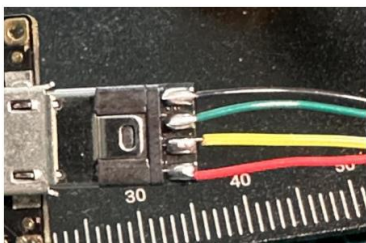
Step 1 – Solder the wires to the pads
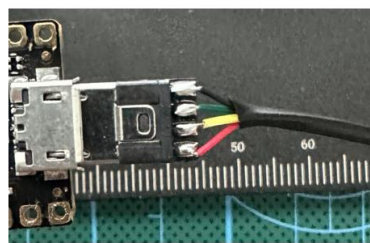
Step 2 – Apply a long length of thin heat-shrink tubing over the wires
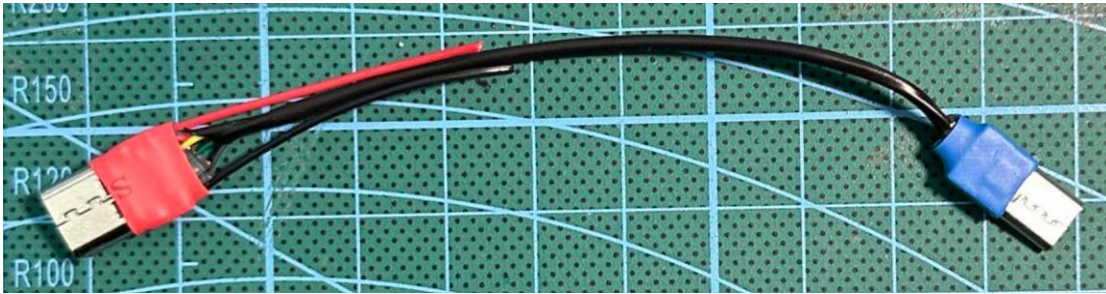
Step 3 – Apply the hot glue to the pads

Step 4 – Use a short length of larger heat-shrink tubing over the pad areas

The final USB-C / Micro SD connector harness:

In a later step, the above harness will be routed (underneath) the ProffieBoard area of the chassis. From there the USB-C charging PCB will be situated into the below section of the chassis. Use a small bead of hot glue to secure the solder points from breaking during the install:

6 Wiring the Forward Emitter-Side Chassis

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

Be sure to study the wiring diagram at the bottom of this document to become completely familiar with the battery sled wire locations. The 18500 battery sled is built into the chassis. The positive and negative posts reside within the chassis.

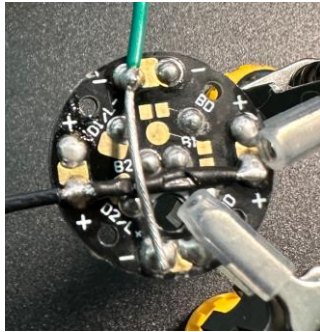## 6.1 Wiring the Shtok Chassis-Connecting PCB

1- Cut required lengths of the following wire (includes a bit of extra slack):
   a. Red 22 AWG – 120mm
   b. Black 22 AWG – 120mm
   c. Green 22 AWG – 30mm
   d. Violet 28 (or 32) AWG – 120mm
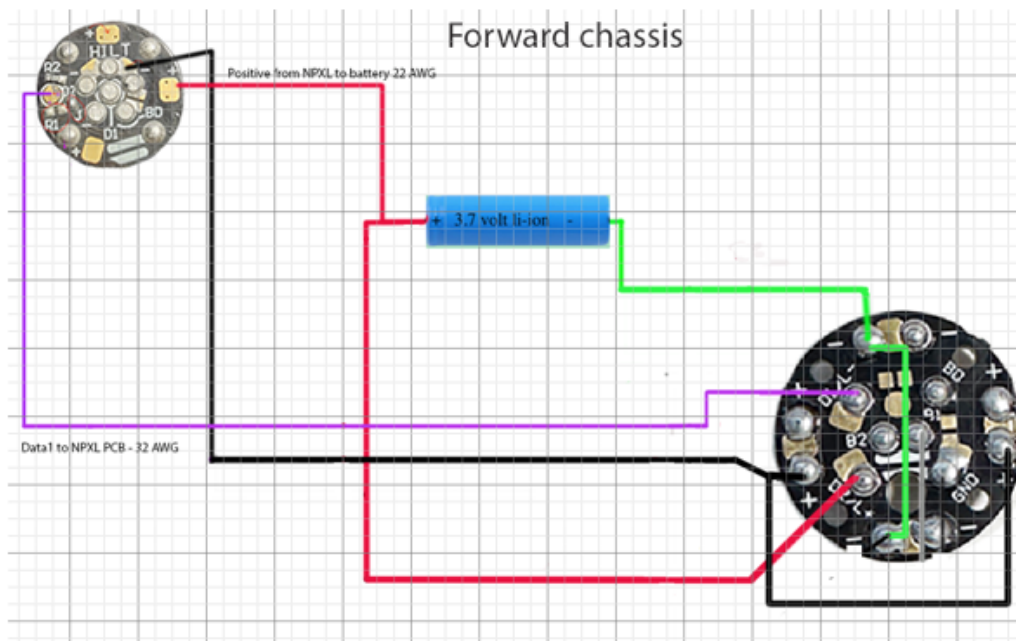

2- Be sure to provide an extra amount of wire slack past the NPXL PCB location on the other end of the chassis.
3- Solder the wires along with the two (-) jumpers to the specific pads of the Shtok PCB as seen in the wiring diagram:
   a. Strip approximately 18.5mm of the black 22AWG wire (in order to reach both pads as seen in the image below). For this PCB, the pads marked (+) will actually be used for the (-) black wire.
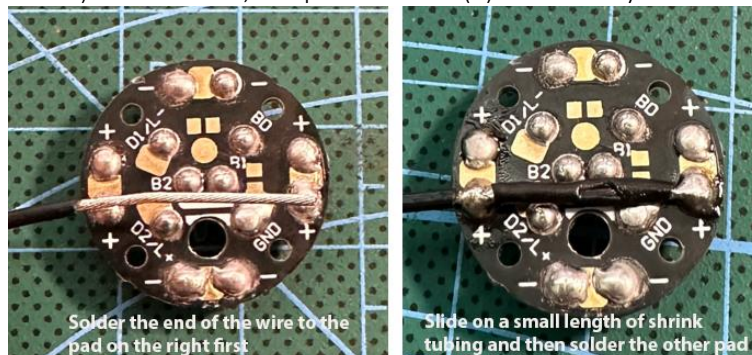
b.   Repeat the above steps for the green 22AWG wire and solder to both pads as seen in the above wiring diagram:

c.   Example of completed wiring:
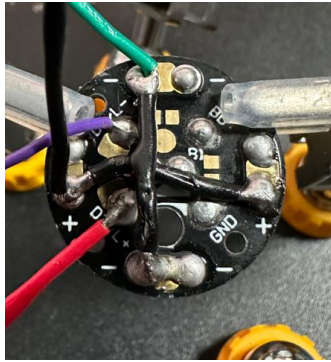
4-   Cut an 11mm length of 3mm brass rod and round one edge using a Dremel tool or sandpaper. This rod will be used to line up the two pins on the chassis-connecting PCBs later.

5-   Glue the rod into the hole on the chassis-connecting PCB which has the pogo-pins, with a short length of the rod on the opposite side of the PCB to anchor to the glue.

The brass rod goes here in the PCB on the end of the emitter-chassis

The rod connects here into the corresponding PCB on the connector ring chassis module

6-   Solder the green 22 AWG wire to the (-) metal battery post, with just enough room for it to slide into the designated spot in the chassis.

7- Run the 3 remaining (red, black and violet) wires through the wire channel and over to the NPXL end of the chassis, and then press the negative battery post into place in the compartment at the Shtok PCB side of the chassis.

8- Set the orientation of the chassis-connecting PCB so that the brass rod will line up correctly to the same location as the corresponding chassis-connecting PCB on the ring chassis (where the tactile switch is located) and press into place.

9- Use a small amount of hot glue to secure the chassis-connecting PCB into place on the chassis.

10- Secure the PCB further by adding a little more hot glue through the square opening behind the (-) battery post. This will also further reinforce the brass rod on the PCB.

NOTE: The gaps seen where the tabs on the emitter-chassis lines up with the emitter-end ring module are intentional. This gap provides enough room for the chassis to rotate to accommodate any slight differences in how the brass connecting rod lines up with the Shtok chassis-connecting PCBs between the two chassis modules.
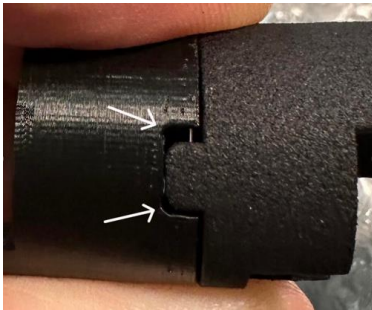

6.2 Wiring the Shtok NPXL PCB

1- Solder the end of the red 22 AWG wire to the (+) battery post, with just enough room for it to reach the designated spot on the Shtok PCB on the other end of the cylinder-shaped forward chassis.

2- Solder a smaller length of red 22 AWG wire to go from the battery post to the NPCL PCB.

3- Slide the (+) battery post into place.

4- 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.

5- Solder the red 22 AWG (+), black 22 AWG (-), and violet 28 AWG wires to the designated pads on the NPXL PCB (as seen in the wiring diagram at the bottom of this document).

6- 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.

7- Carefully attach the plastic lens to the NPXL PCB.

8- Carefully push the NPXL into place into the emitter. Note: Do not use any glue for the emitter as it is designed to be press-fit and removable later in the event the NPXL PCB needs to be replaced.

7 Wiring the Emitter-End Ring Module

1- Cut long 180mm lengths of the following wire (which route over into the flat chassis and will terminate outside the hilt to be later soldered to the flat chassis harness wires.:
   a. Red 22 AWG
   b. Black 22 AWG
   c. Green 22 AWG
   d. Violet 28 (or 32) AWG
2- Solder the wires (including the two [-] jumpers) to the specific pads of the Shtok PCB as seen in the wiring diagram:
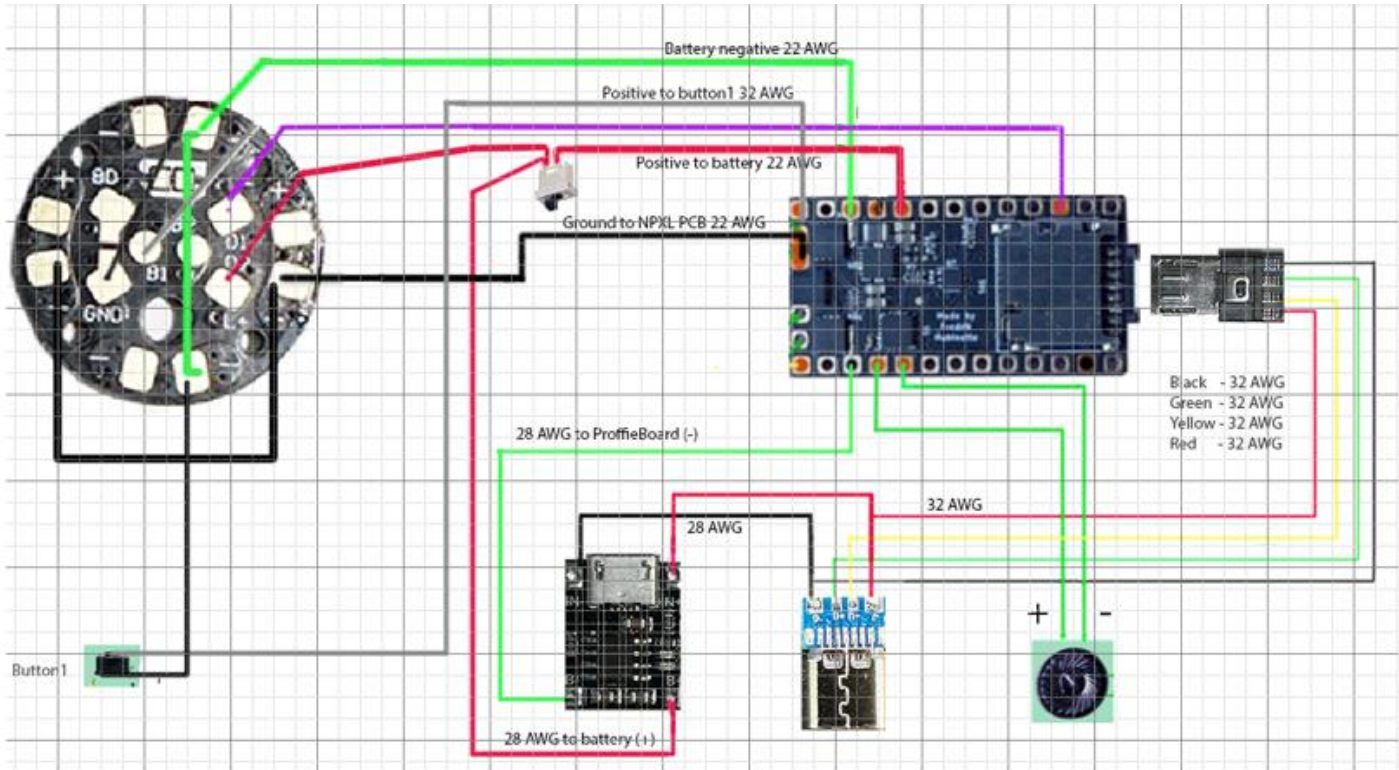

It is suggested to solder on the red 22 AWG and violet 28 AWG wires first, followed by the black and green AWG 22 wires (and jumpers):
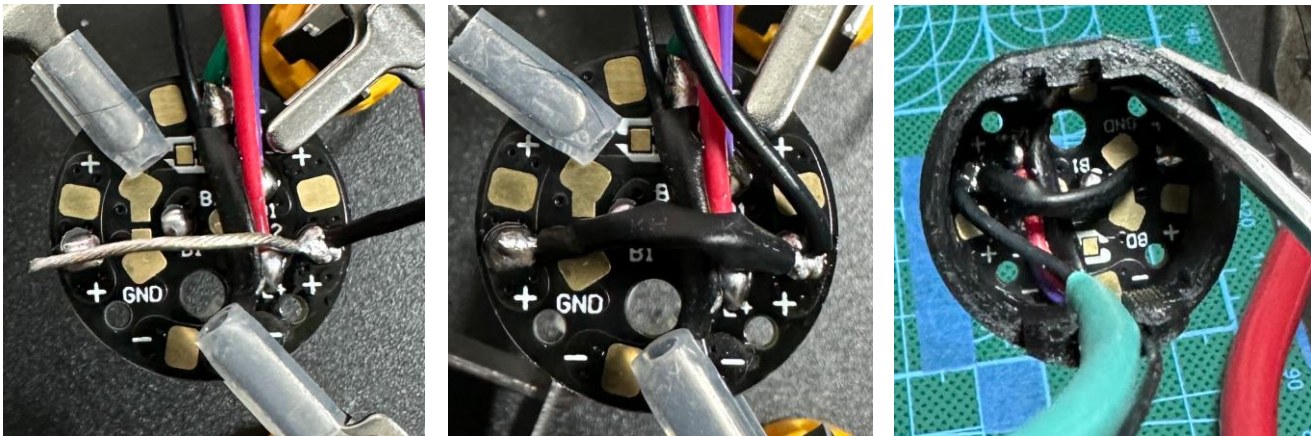
3- Cut the following lengths of wire for the tactile switch:
   a. White 28 AWG – 180mm
   b. Black 28 AWG – 80mm
4- Solder the short (-) 28 AWG black wire directly to the black jumper on the Shtok PCB as seen in the below diagram:
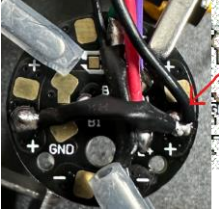
5- Run the white (+) 28 AWG wire (along with the other wires) in the wire harness within the shrink tubing (seen below in yellow shrink tubing). This wire will go directly from the tactile switch out through the wire harness to be connected to the adjacent white wire coming from the flat center chassis in a later step.
6- Use a small amount of hot glue to secure the Shtok PCG-connecting PCB into the emitter-end ring module, and then use a drop of hot glue to hold the wire harness into the channel on the ring module:
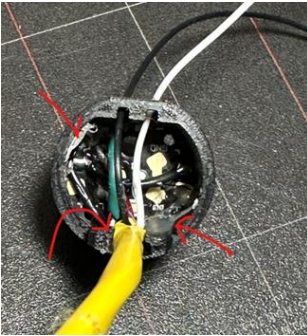
7- To install the tactile switch:
   a. Run the white and black wires through the designated holes in the ring module. Solder them to their respective tabs on the tactile switch, and then glue the switch in place. We use E6000 cement for this part:
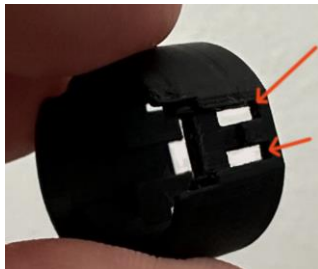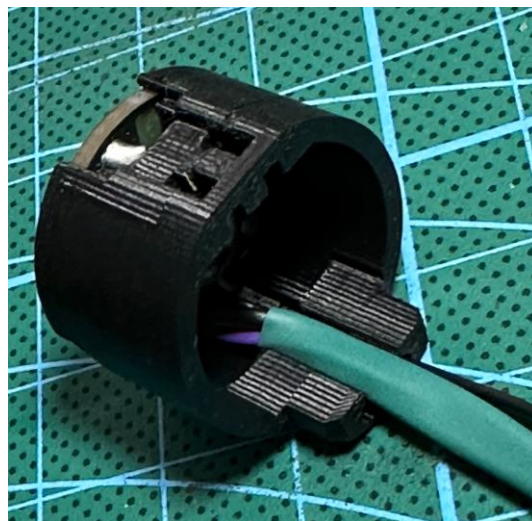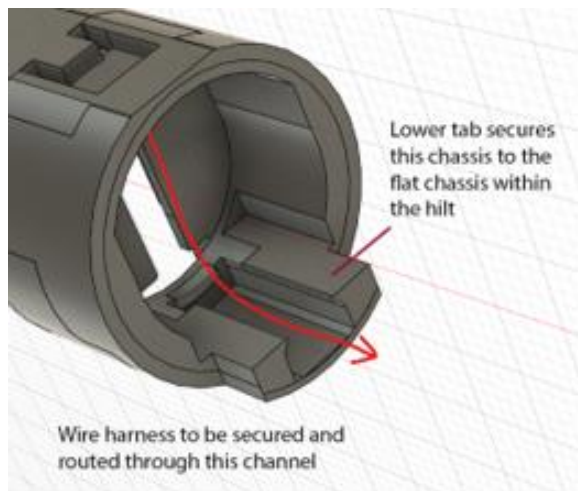
8 USB-C, Kill Key Switch, and ProffieBoard Installation

1- It is very important to glue the USB-C PCB in place first, while doing so be sure to push it to the left a little to allow wire room from the ProffieBoard.
2- After the USB-C PCB is glued into place, insert the USB-C port into the slot to the left of the USB-C PCB.
3- Run the wire USB-C data wire harness out to the right end of the flat chassis. (The microSD port will be plugged into the ProffieBoard in a later step).
4- Glue in the kill key switch.
5- Run the USB-C data harness under the ProffieBoard as seen below, (noting the below image is just for reference - we wire the black and green 22AWG wires underneath ProffieBoard for better wire management):

6- Glue the ProffieBoard in place. Hot glue is recommended for several reasons, 1) It will hold the ProffieBoard in place regardless of the opposing force caused by the wires and 2) it is removable later when used in light amounts.
7- If you have not already done so, upload your fonts to the SD card and insert it into the ProffieBoard.
8- Plug the microSD port into the port on the end of the ProffieBoard.
9- Route all wires to the left of the kill key switch and out the side of the chassis as seen in the above image.
10- Now that all wiring is complete in the flat chassis, use a small amount of hot glue to secure the USB-C port in place.
11- Insert the flat chassis into the hilt, with the main wire harness routed out to the side of the hilt.
12- Now you can insert the emitter-end ring module through the emitter-end of the hilt (pulling it's wire harness through first) until it sits in place on the designated groove of the flat chassis. (You should now see the tactile switch through the button hole of the hilt). Run the wire harness of the ring module out the side of the hilt (just as was done for the flat chassis wire harness). The below image shows an (uninstalled) chassis to clearly indicate part location (as well as wire harness path):
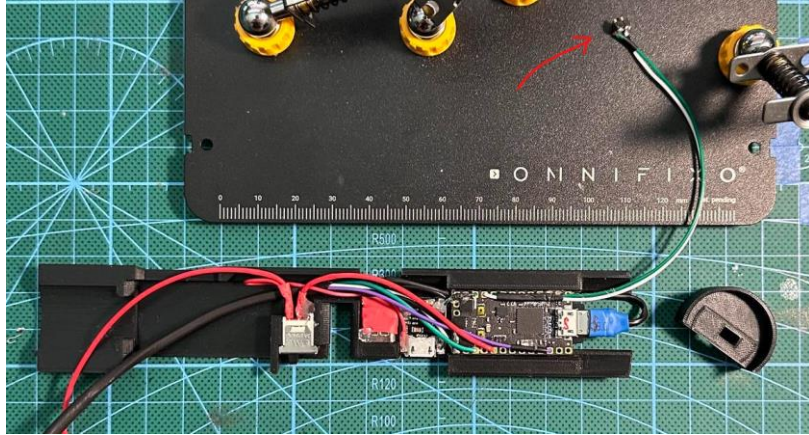
Lower tab secures this chassis to the flat chassis within the hilt

Wire harness to be secured and routed through this channel

Short video demonstration of this step:
https://www.youtube.com/shorts/HTX_nIhp2yI

9 Speaker Pogo Pin Holder Wiring and Installation

1- Solder the white and green 28 AWG wires from the ProffieBoard to the pogo-pin connector:

In a later step, (while the flat chassis is being inserted into the hilt) the wired pogo pin connector will first be routed out of the speaker end of the hilt.

10 Installing the Completed Sub-Assemblies

Once the electronic installation is completed for all three components you can start the process of installing them into the hilt. Note: Do not glue any of these components into the hilt, they are designed to be press-fit only!
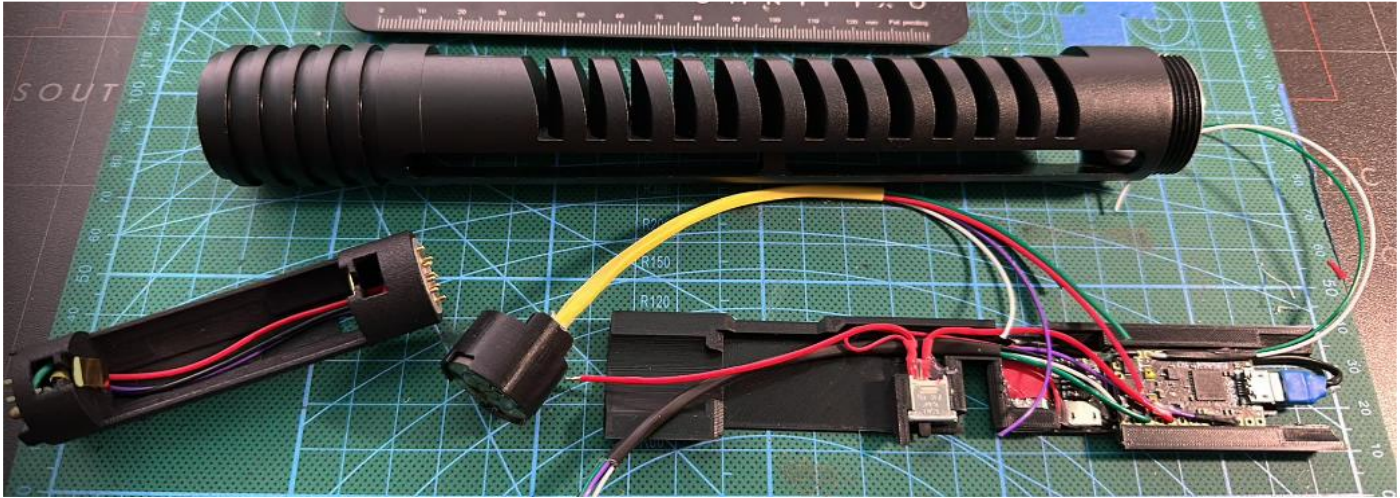
10.1 Installing the Flat Chassis

1- First, start the slow and careful process of sliding in the flat chassis into the hilt. Be sure to route the pogo-pin connector out through the speaker side first:
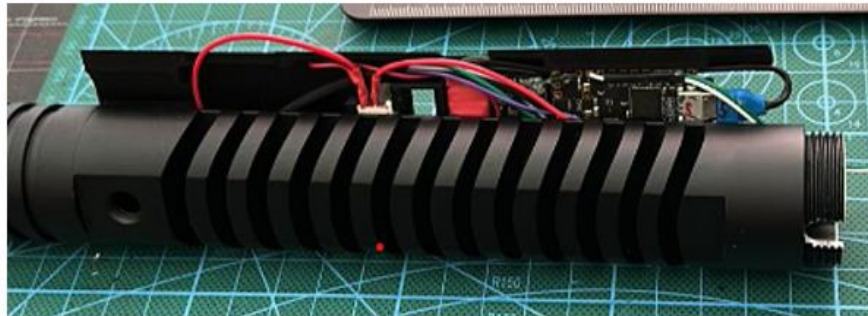

2- Carefully and methodically work the flat chassis into the hilt, paying extra attention to the SD connector wire at the speaker-end of the chassis. Take your time as to not damage any of the wires:

10.2 Installing the Center Ring Chassis

1- Next, insert the center "ring" chassis by first routing the wire harness in first through the emitter-end of the chassis. Verify the tactile switch is lined up with the designated opening on the hilt before inserting the ring chassis. Be sure the aluminum emitter-end extension of the hilt is removed for this step.

2- Line up the wire harnesses (one from the ProffieBoard and the other from the center-ring chassis) and bend them in the direction seen below:
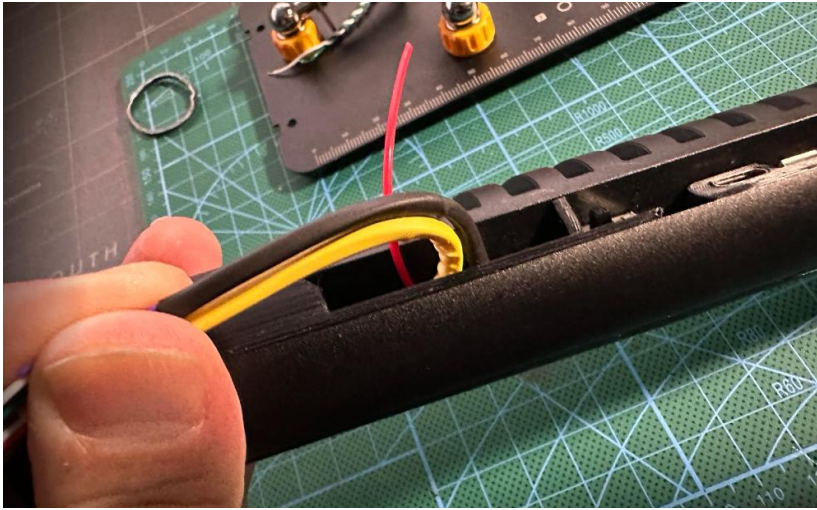

3- Next cut the harnesses at the exact point where they will easily slide into the chassis when in this position. Note – in the below image it can be seen the tactile switch is not yet lined up with the button opening. This is not an issue as it will line up in a later step.

10.3 Wiring Together the Sub-Assemblies

1- Screw the aluminum emitter extension hilt piece back on, and then insert both the forward chassis (without the battery) and the blade-plug tool. This will hold the center ring chassis in the proper place while soldering the two wire harnesses together as seen in the next steps:
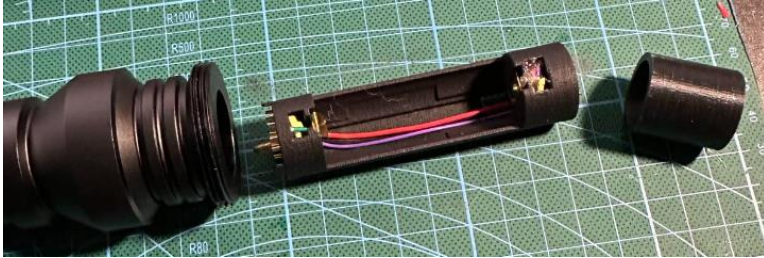
2- Solder together all the like wires, using heat shrink tubing thereafter to insulate the connections:
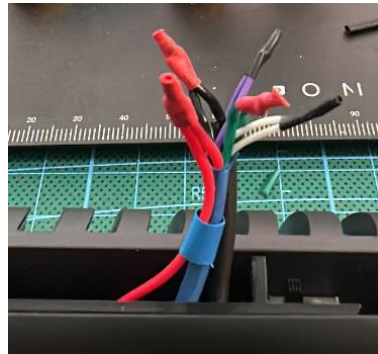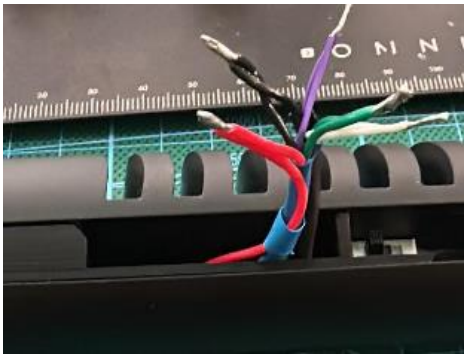
3- Protect the finished ends with a larger heat shrink tube and push the newly connected harness into the hilt:

10.4 Installing the Pogo-Pin Connector

1- Secure the pogo-pin connector in place into the speaker pogo-pin holder with hot glue. We recommend the white (+) wire is oriented towards the center (to match the corresponding [+] pad on the connecting round speaker PCB):
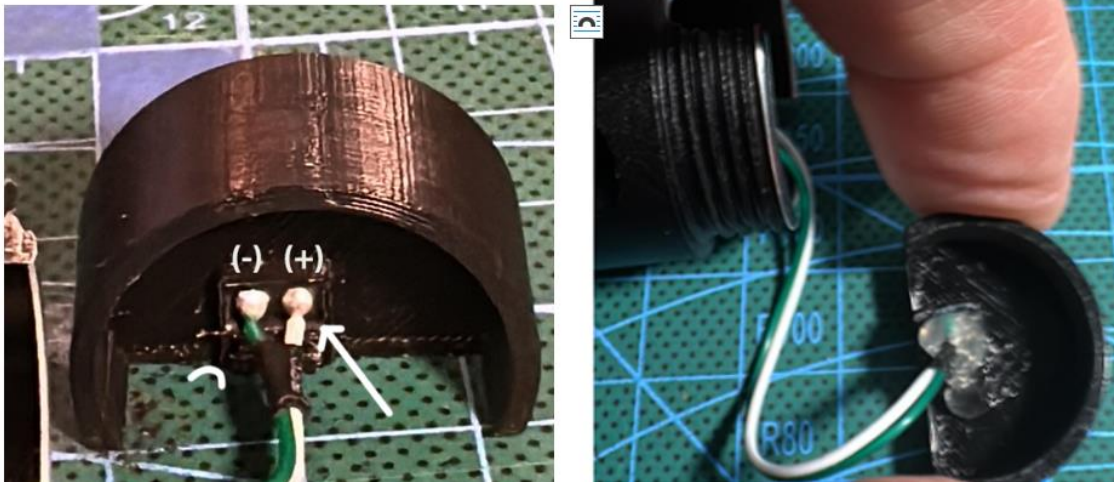

2- Insert the speaker pogo pin holder module into the speaker end of the hilt, with the orientation of the open area allowing clear line of sight to the SD card on the ProffieBoard. No glue is required as this module will stay in place.

11 Speaker Pod (28mm)

11.1 Required Speaker Modifications

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

1- Carefully Remove metal (+) and (-) posts from their respective plastic tabs being very careful not to damage the delicate parts of the speaker.
2- From there cut off the plastic tabs which held the metal posts. A hobby saw works well for this task. Be sure to leave the remaining 4 posts untouched.
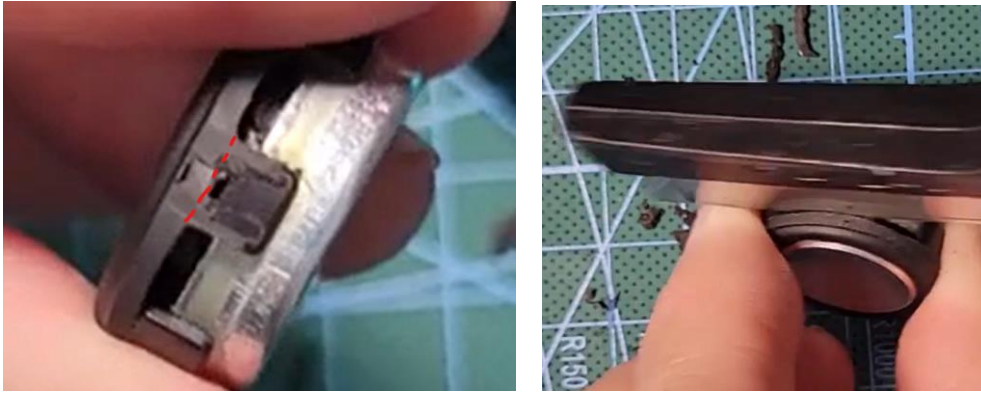

3- This is how it should look when completed, noting the wire lead (seen with the red arrow below). There will be a lead on each side of the speaker, which will be used to solder the (+) and (-) speaker wires to:
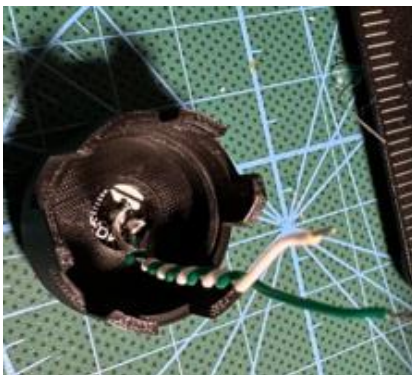
11.2 Speaker Pod Wiring and Installation

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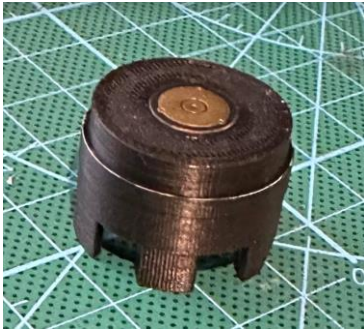

1- Solder a 50mm long white (+) and green (-) 28AWG wires to the pads of the speaker PCB. We use the center pad for white wire to coincide with the white (+) wire on the matching pad of the pogo pin connector:

2- Strip and tin the other ends of the speaker wires in preparation for soldering them to the respective wires on the speaker.
3- Route the wires through the PCB hole and press fit the PCB into the pod, then apply glue to secure the PCB in place from the inside. We have excellent results using hot glue or this:

4-   Solder the (+) and (-) wires to the respective leads (from the speaker), along with shrink tubing thereafter to prevent the wires from shorting out against the metal speaker housing:
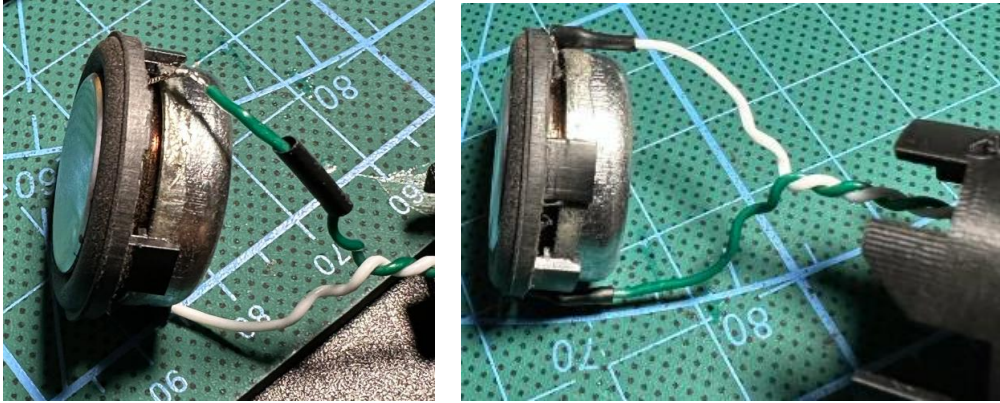
5-   Apply a (very) small amount of hot glue to just initially hold the wires in place as follows:

6-   Set the speaker in place into the pod, then hot glue into place through the sides where the (+) and (-) wires are exposed. Be sure not to over glue as that will impede fitment of the pod into the hilt:

12 Speaker Pod (24mm)

No modifications are required to the 24 mm speakers.

> Note: For a perfect press fit of the speaker PCB, you may have to lightly sand the outer edge of the PCB (NOT the speaker pod). Be sure to test fit this part into the pod and then sand the PCB as needed for proper fitment before starting.
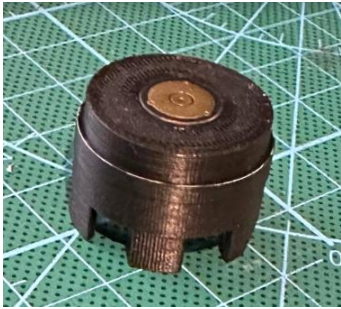
1- Solder a 50mm long white (+) and green (-) 28AWG wires to the pads of the speaker PCB. We use the center pad for white wire to coincide with the white (+) wire on the matching pad of the pogo pin connector:

2- Strip and tin the other ends of the speaker wires in preparation for soldering them to the respective wires on the speaker.
3- Route the wires through the PCB hole and press fit the PCB in place:

4- Solder the (+) and (-) wires to the respective pads on the 24mm speaker.
5- Set the speaker into the pod, then hot glue in place through the sides where the (+) and (-) wires are seen.

13 Wiring Diagram

13.1 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.

To accommodate the large size of diagram, it has been split into two images below. Zoom in by expanding this document for better detail within the wiring diagrams below.
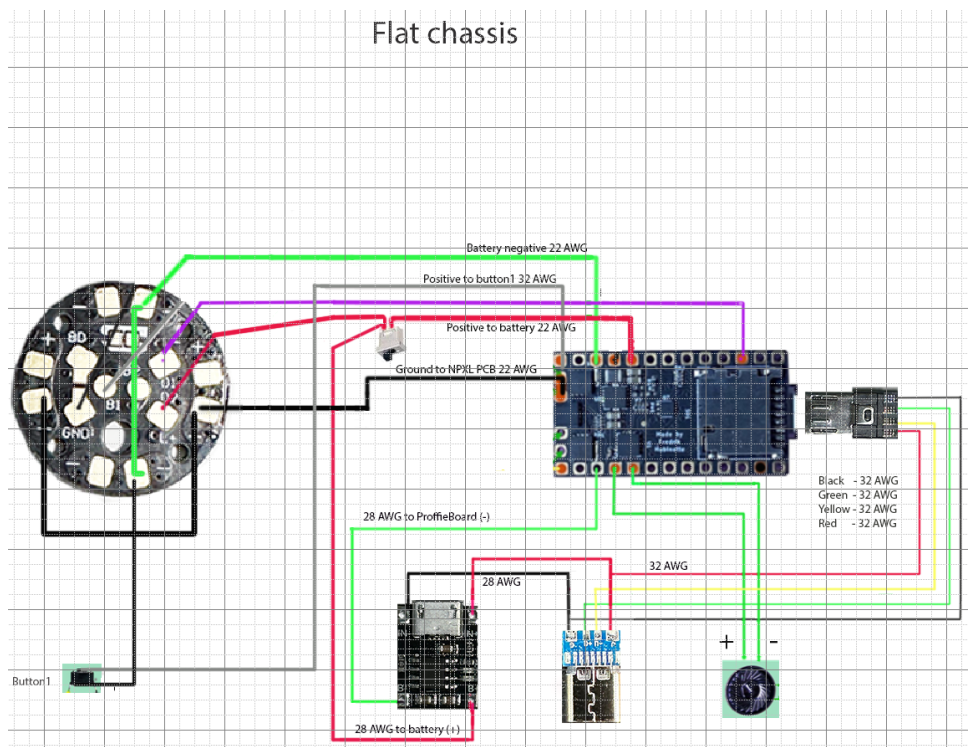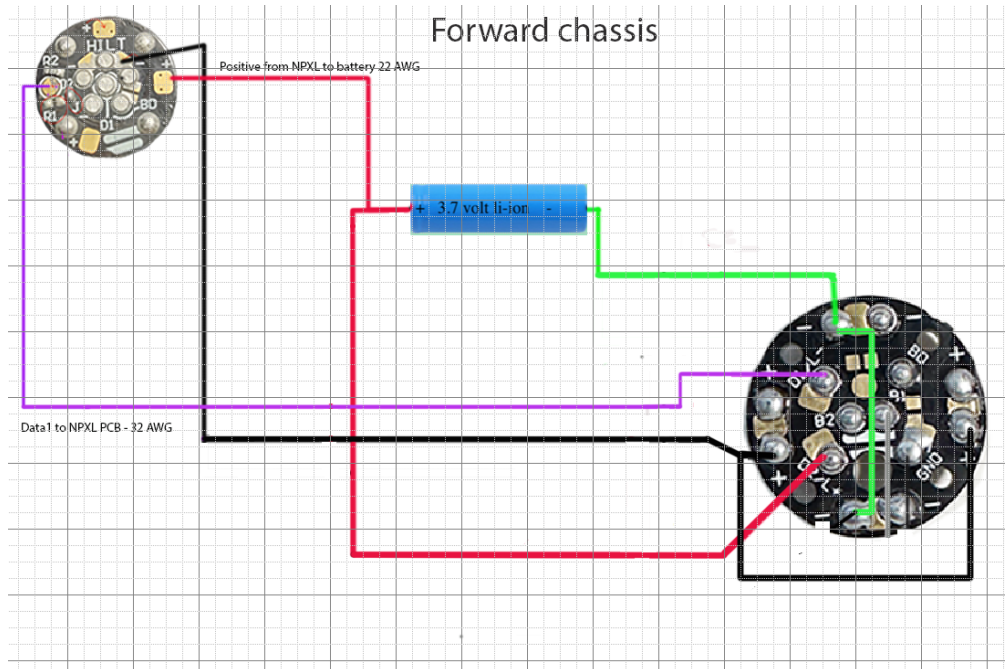
13.2 ProffieBoard 2.2 Pads

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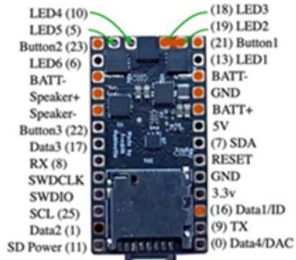

Note: As always, be sure to be completely read and be fully familiar with component vendor's documentation.

14 Post-Install

14.1 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…
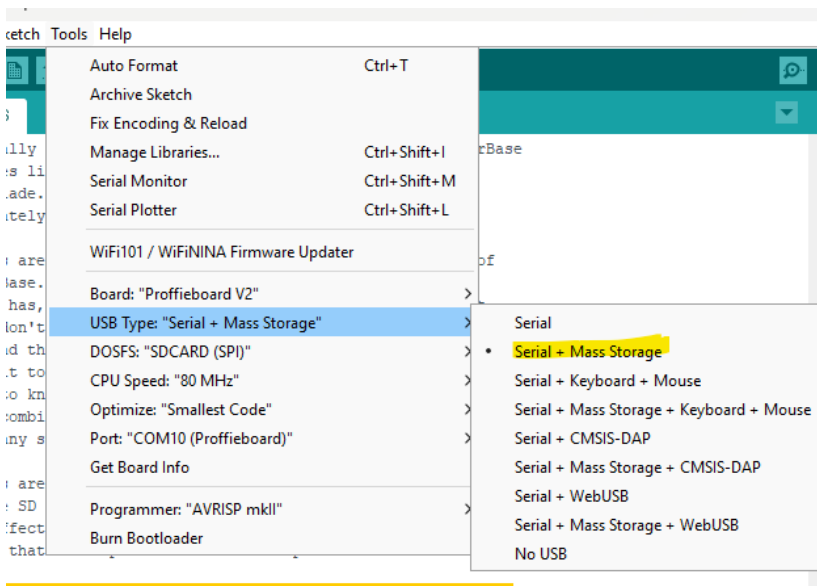
14.2 Important Reminders and Warnings

Due to the unusual and tight geometry of the Quai-Gon hilt additional and extra precautions must always be followed when handling and using this chassis set:

- **DO NOT use the metal blade plug to hold the emitter-end chassis in place. Doing so will short out and destroy your electronics!**
- **DO NOT** turn on your saber without the emitter-end cylindrical chassis firmly in place! Doing so could damage your ProffieBoard and other electronics! Be sure to have a NON-METAL blade plug or NPXL blade in place)!
- 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!
- BE EXTREMELY CAREFUL NOT TO INSERT THE EMITTER-END CHASIS BACKWARDS INTO THE HILT! Doing so will short out your electronics! Be absolutely sure to always insert the end with the Shtok 10-pole PCB inward into the hilt.

15 Adjusting and Securing the Power/Auxiliary Buttons

The screw seen under the PWR button 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. Otherwise it will loosen over time which causes the plunger screw to no longer properly depress the tactile switch on the chassis within 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. Note: Do NOT glue the actual button to your hilt!

16 Emitter-Side Chassis Insertion and Removal Instructions

These instructions can be seen within the following YouTube video:
https://www.youtube.com/watch?v=YwisSISQWtg

Important!

- Be sure to always insert the emitter-end chassis into the hilt facing the correct orientation (with the NPXL PCB outward.
- Remember to always be careful handling the emitter-end chassis when it is outside of the hilt.

17 Additional

We hope you truly enjoy this chassis set 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 installation process of these parts for your saber. We are always happy to help!