

Assembling the

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General advice

DNA and the micro USB charging board, should be handled with care, electrostatic discharge (ESD) might destroy them. Handle (solder and modify) the boards on a discharge protected area (EPA) workplace. International standards like IEC and ANSI might help you to set up an EPA compliant workplace.

You will need some skilled craftsmanship to build the mod, but I cannot warrant that it finally will work, even if you exactly follow the following description.

The Housing

The holes on the mod for holding the switches are typically a bit undersized (since metal printing is not really precise, and it's easier to enlarge holes, than to make them smaller). So it is needed to enlarge the holes a bit, in a way that the switches fit. You might use a round file, or a 4mm Dremel chain saw sharpening stone (453) for doing this.

Before cutting the M7x0.5 thread for the 510 connector, the hole of the 510 connector should be enlarged with a 6.5mm drill bit. To ensure the 510 connector is in right angle, aligning the Thesias housing on a drill press during drilling and cutting the thread will help.

The 2.5 mm thread for holding the fire button are blind holes, please consider this when selecting the screw tap for this threads. Please use good cutting oil when drilling and cutting the threads.

The DNA Board

Preparing the wires for the DNA board: for the battery and the 510 connections you may use a 1 mm silver coated copper wire with a 1.07 mm insulating hose, for the switches and the USB board connections a 0.5 mm insulated wire.

You might use the following wire lengths:

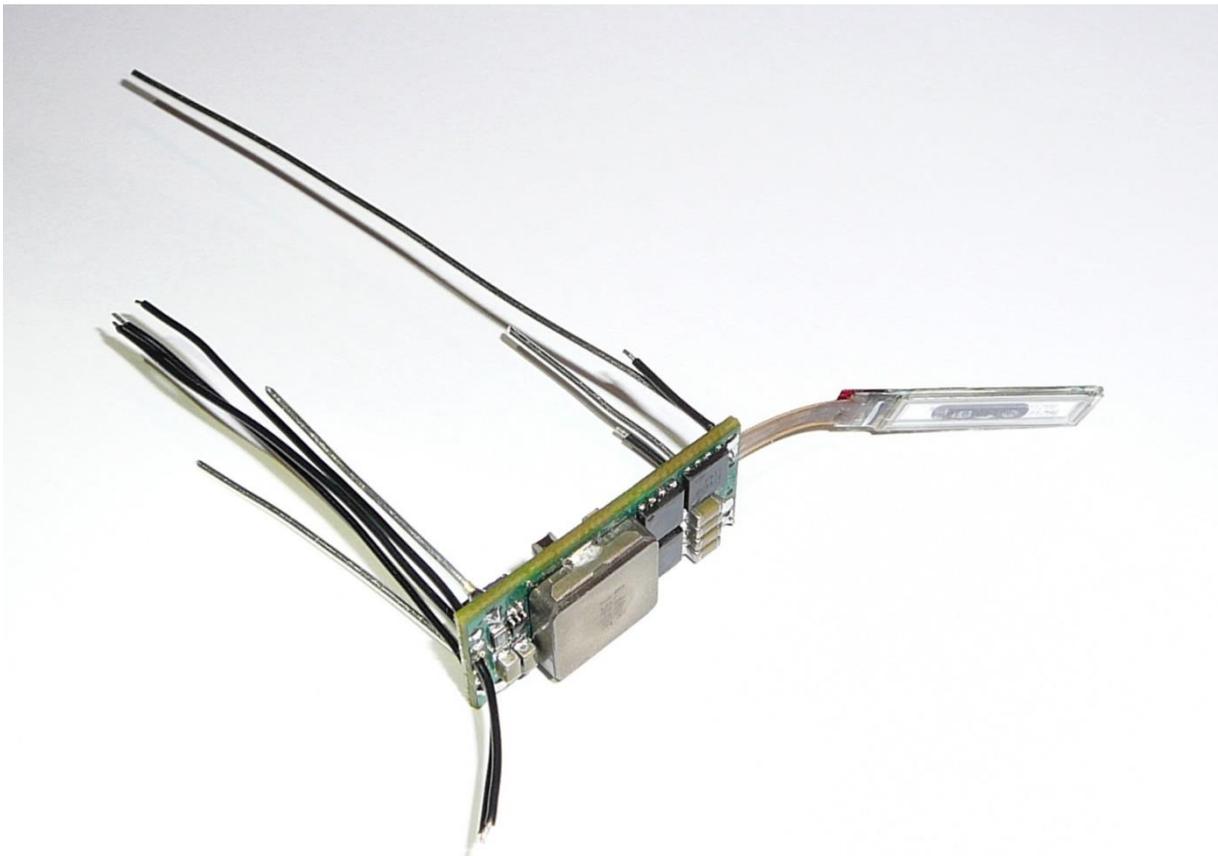
1 mm silver coated copper wire and 1.07 mm insulating hose:

+Bat pole	wire: 85 mm	insulator: 80 mm
-Bat pole	wire: 30 mm	insulator: 25 mm
+510 pole	wire: 30 mm	insulator: 26 mm
-510 pole	wire: 41 mm	insulator: 26 mm

0.5 mm insulated wire:

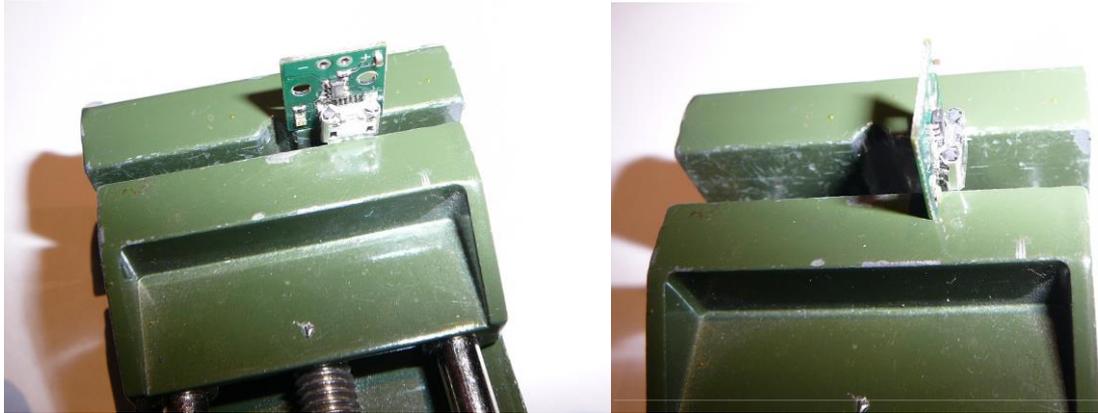
3x up down button	55 mm
2x USB charger board	16 mm
2x fire button	20 mm

When soldering the wires to the board, take care not to stick them too far into the holes. Especially the wires for the fire button, which is soldered on the opposite side, should be just flush on the soldering side. A powerful soldering station will help soldering the battery and 510 connections on the DNA.

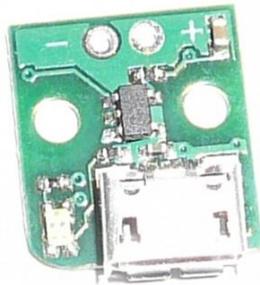


The micro USB charging Board

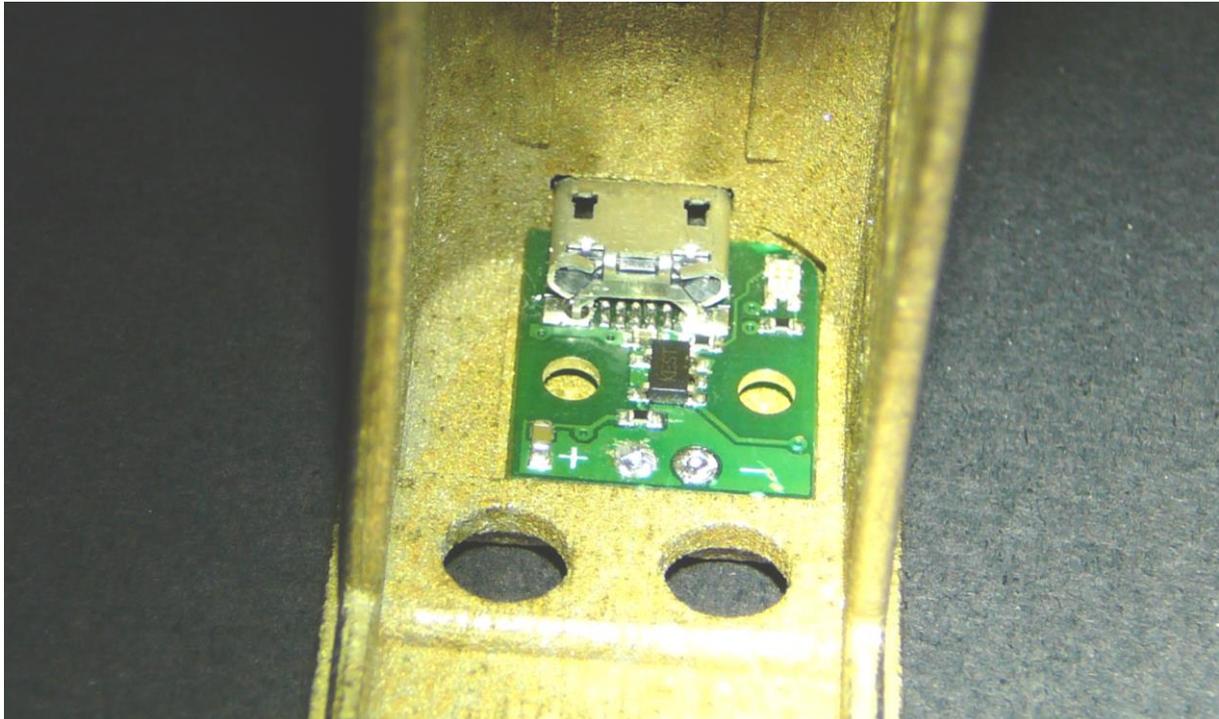
Some modifications are needed on the micro USB charging board. First the crimps on the micro USB connector are flattened a bit.



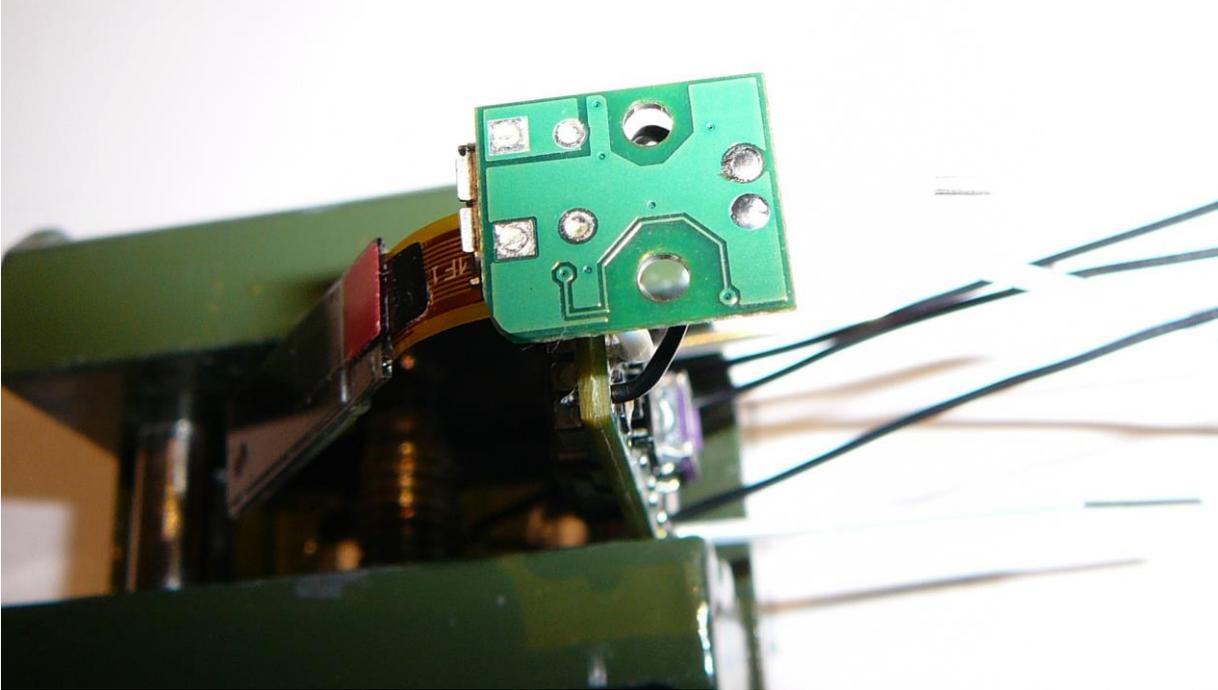
Then the edge of the charging board where the LED is located is rounded with a file.



So that finally the charging board fits well to his place on the mod.



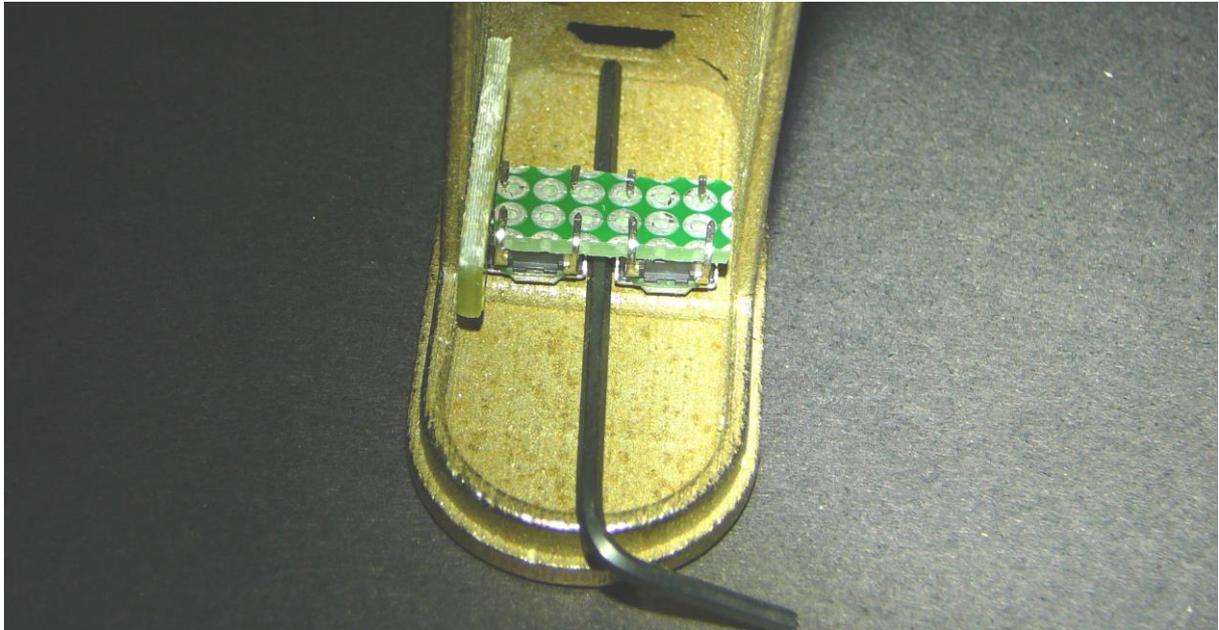
When soldering the connections from the charging board to the DNA, care should be taken, that the soldering points are not much embossed on the bottom side of the charging board, but just flush.



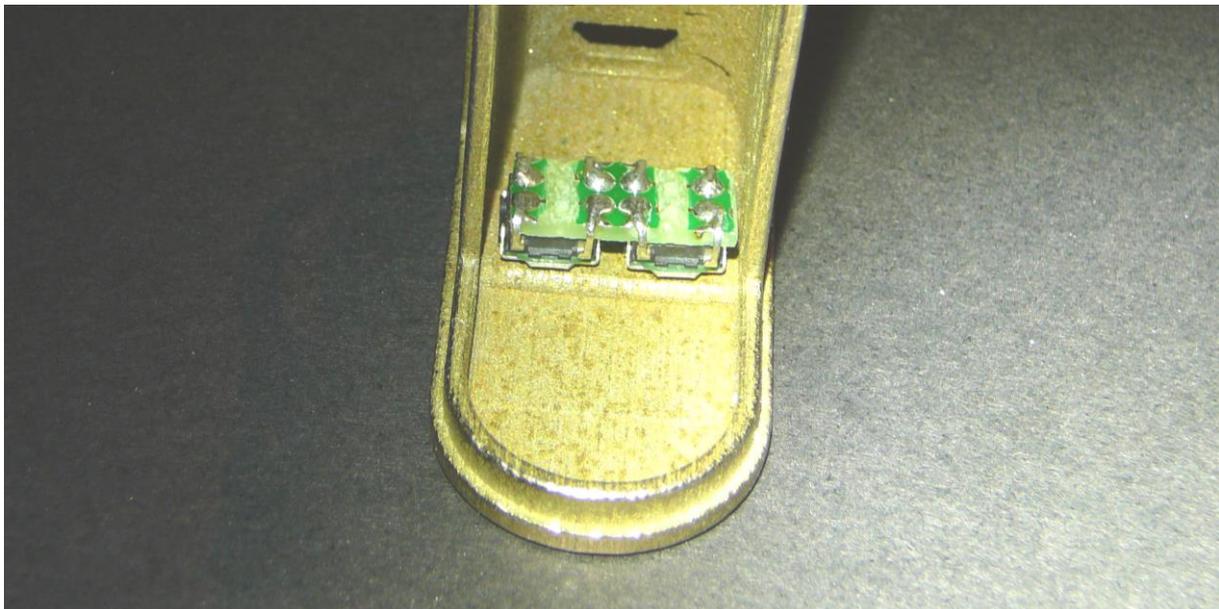
The up/down Switch Board

For mounting the up and down switch, around 7 x 16mm of a 1.2mm prototyping board might be useful. The pins are wrapped around the board on the sides.

To ensure, the switches have the right position on the board, it is easiest to place them on the board, to stick them into the provided holes on the mod and then solder them to the board inside the mod. At the left side of the board, there should be enough place for the minus pole battery holder plastic part, that will also hold the up down switch board. At the right side, the board should not touch the mod.



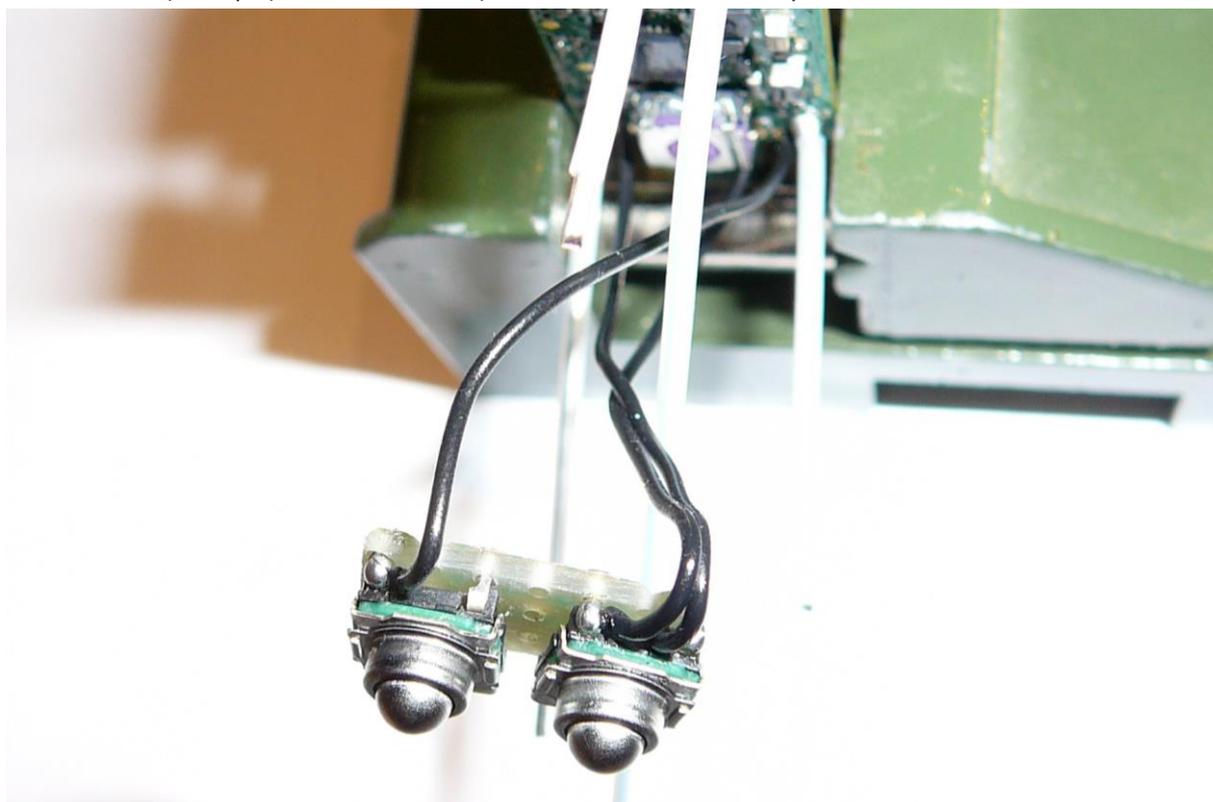
The soldering points should not be too much embossed. Please check that the minus pole battery holder plastic part fits well in its place and holds the up down switch board well down.



Down- (Pin 2 on the DNA) and Up- (Pin 5 on the DNA) are connected on the DNA board, so only three wires are needed, but the down- and up- pins of the switches have to be connected (the two middle pins of the switches on the shown board are interconnected, since the pads on this board are all interconnected by default).



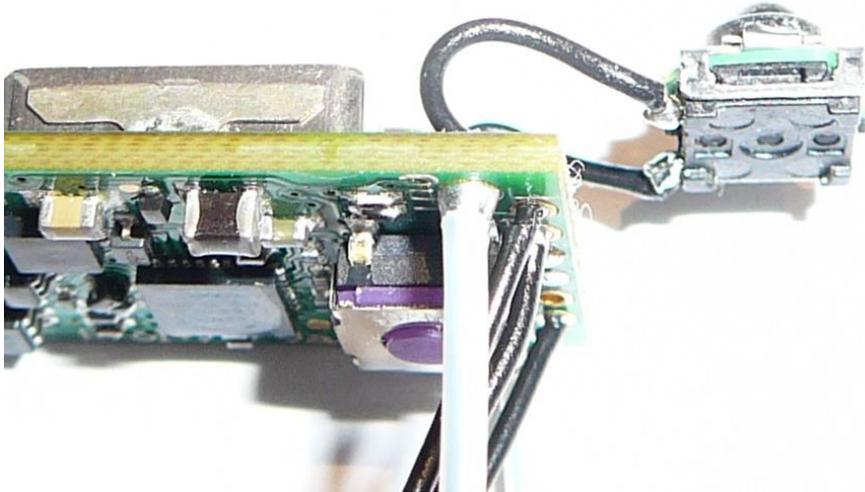
Now you might solder the up down switch wires. Soldering them directly to the switches on the upper side of the board will make the assembling easier. Up+ (Pin 6 on the DNA) might be soldered on the outer pin of the left switch when looked from behind, down+ (Pin 1 on the DNA) on the outer pin of the right switch (so the wires are crossed when the board is mounted on its place). Down- (Pin 2 on the DNA) or Up- (Pin 5 on the DNA) is connected to an inner pin of one switch.



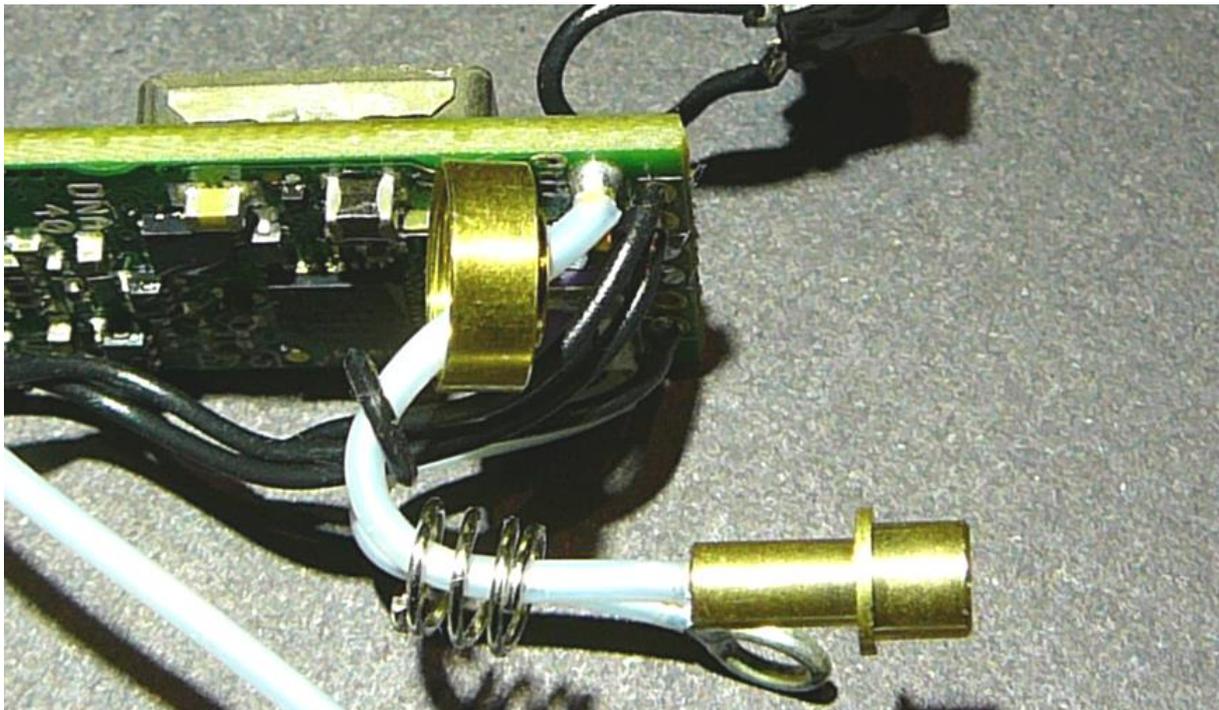
(Please note, for the mod shown here, I did not wrap the pins of the switch around the board at both sides, but stick them through the holes at one side, but wrapping them around at both sides, as described above, is the easier way, and the switches get less twisted.)

Fire Button and 510 Connector

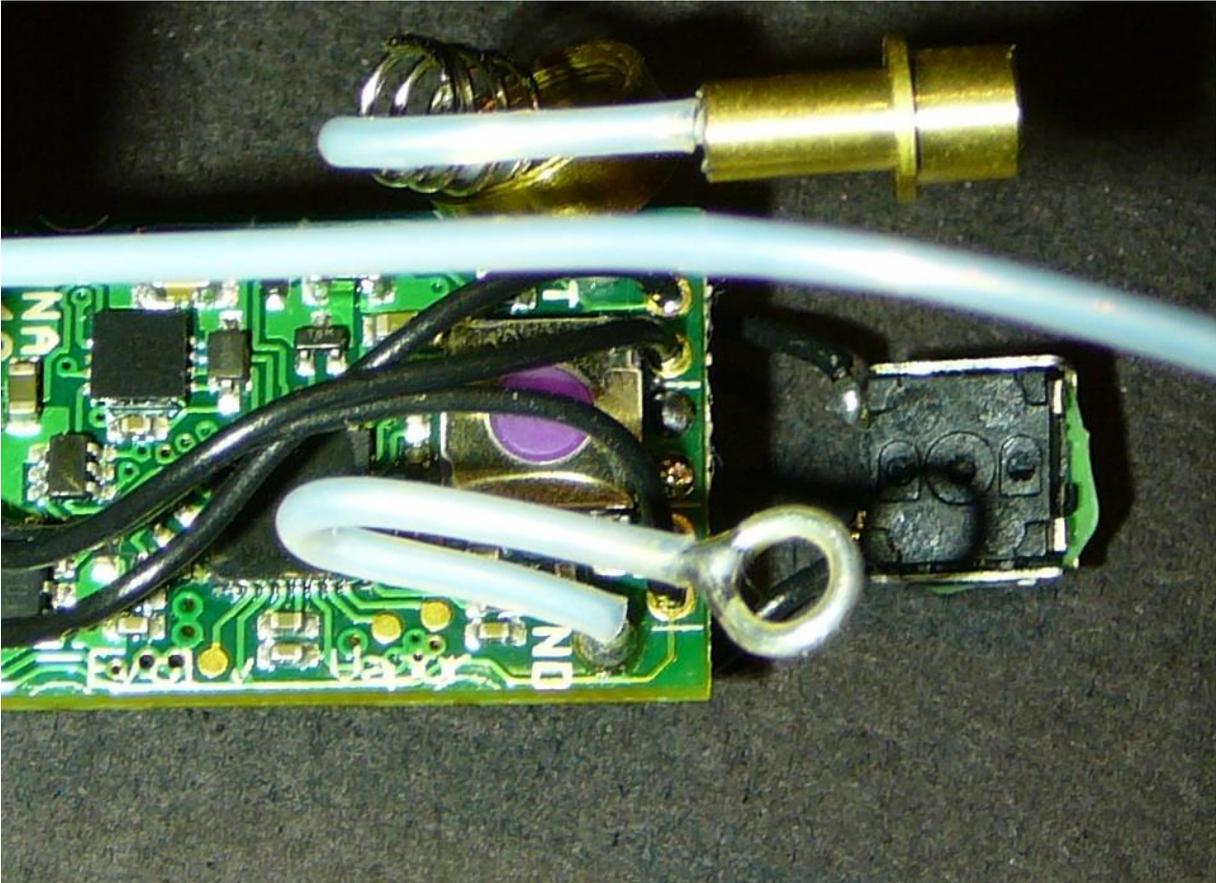
The fire button pins are cut away at one side, shortened at the other, and the fire button wires are soldered.



Do not forget to put the 510 connector parts in the right order in place, before soldering the 510 center pin.

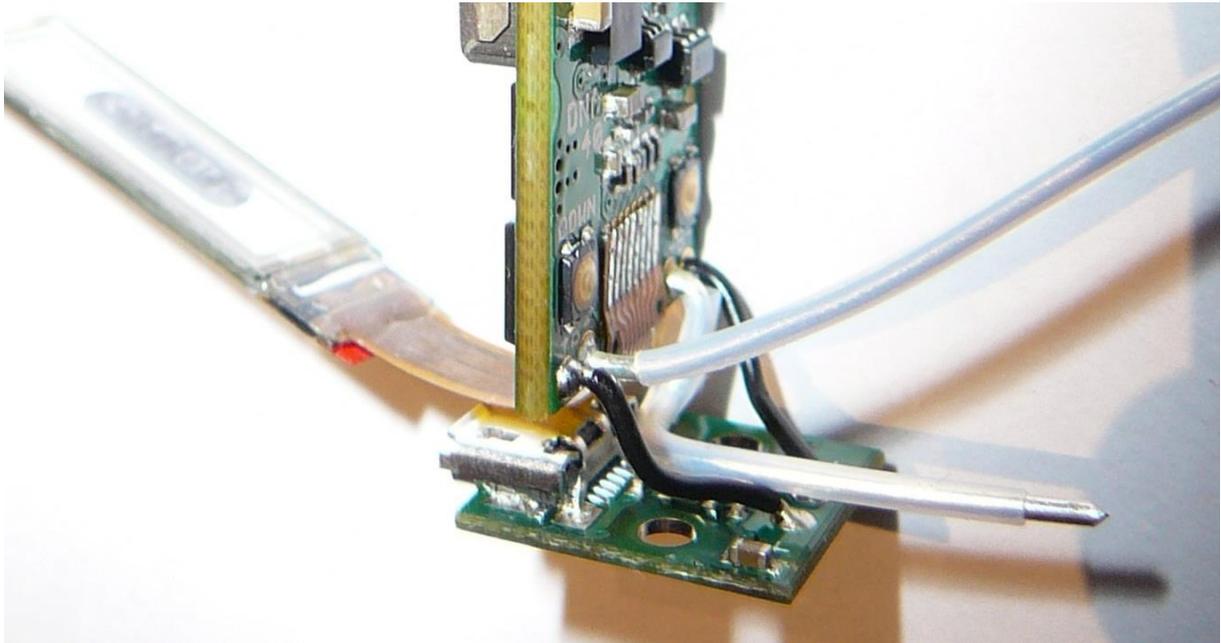


Loop the ground wire (e.g. around a 2.6 mm drill bit), solder the loop, and assure that a 2.5mm screw fits easily.

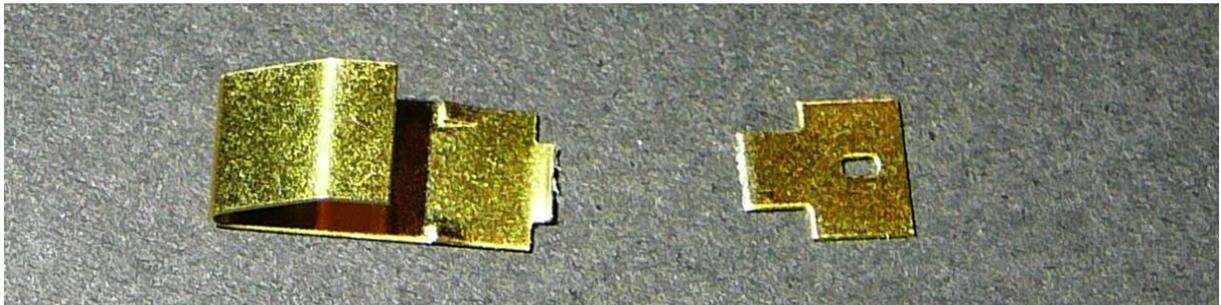


The minus Pole Battery Connector

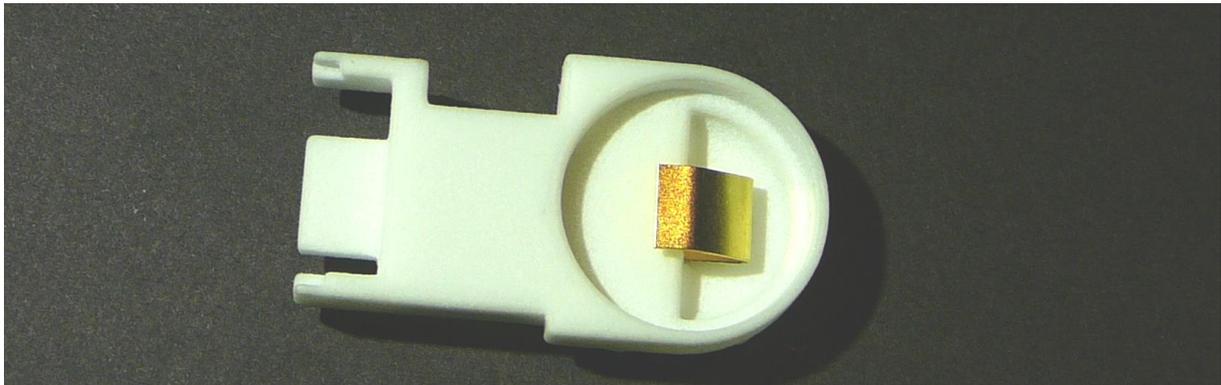
Bend the minus battery wire as shown.

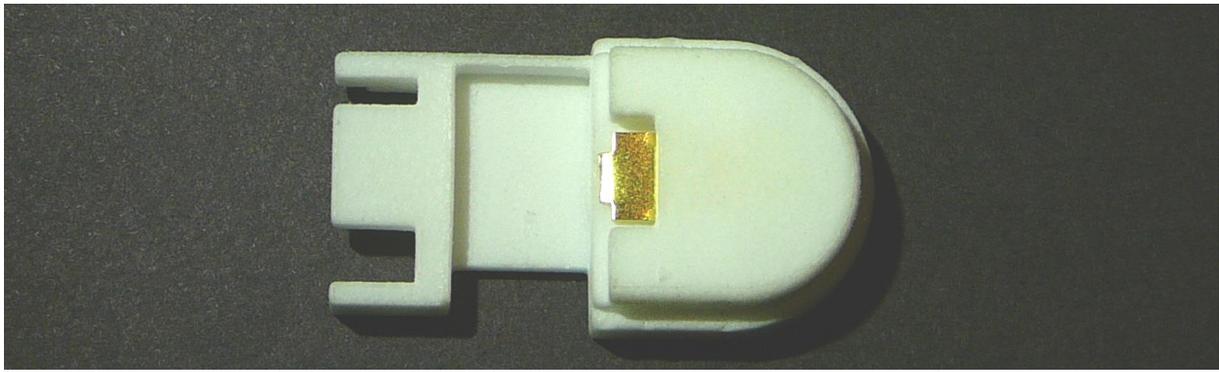


Destroy a battery contact of a Keystone #1042 Battery holder. It is useful for mounting, if the end is bent a bit up as shown.

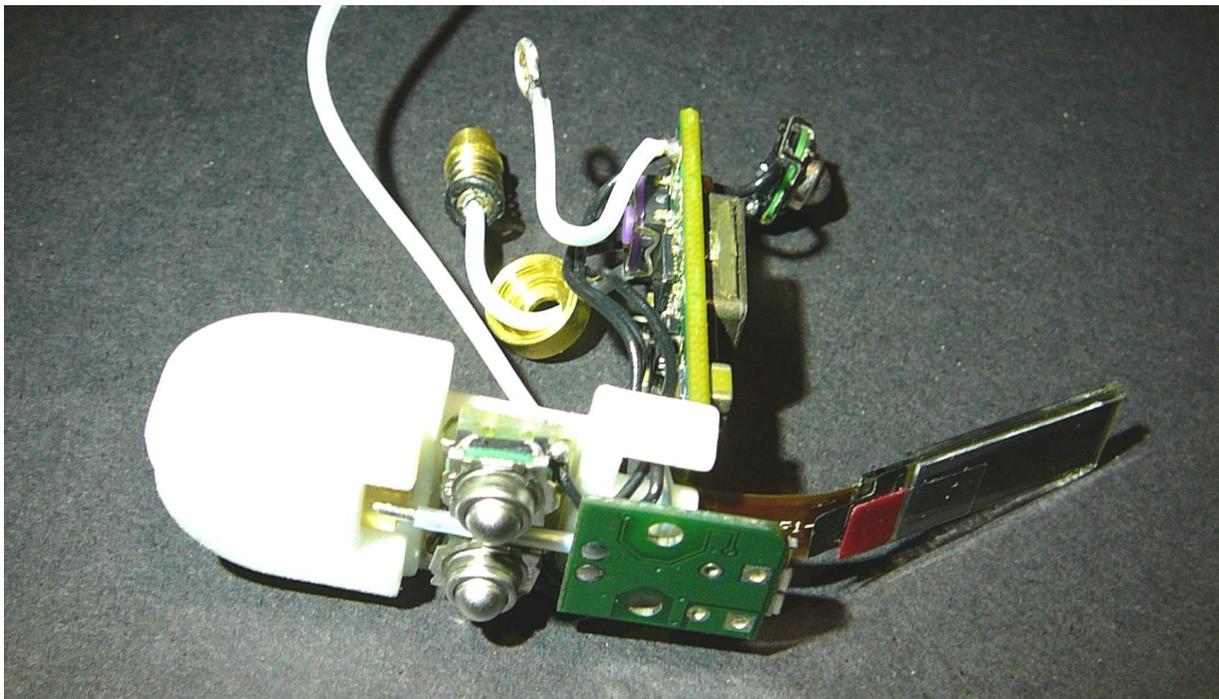


It might also be useful to free the slit holding the battery contact from superfluous 3D powder before pressing the contact in its place.

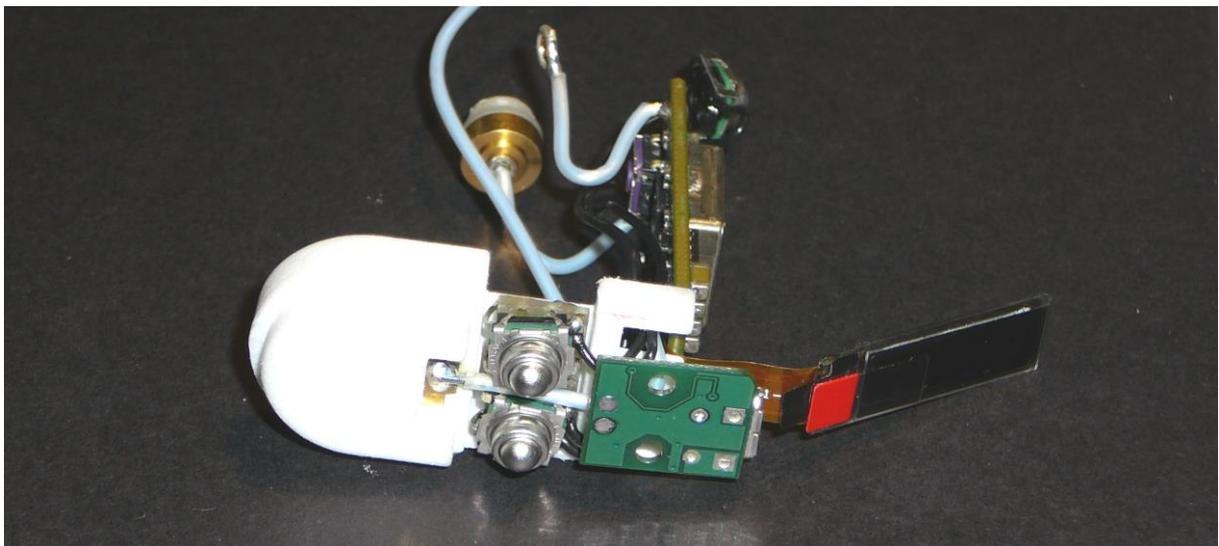




If the minus pole battery holder plastic part does not fit in its place, you might file a bit material of the plastic away, but not as much that it will be loose. It should fit a bit tight. Then you might mount the minus pole battery holder plastic part on its position.



Then solder the minus battery wire.



The plus Pole Battery Connector

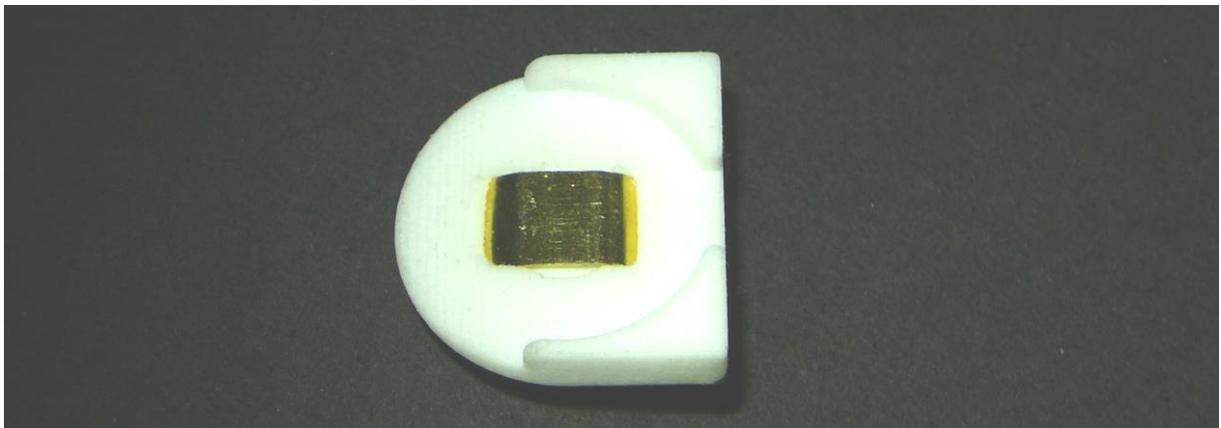
Destroy the other battery contact of the Keystone #1042 Battery holder and bend it like shown.



Depending on the batteries you use, it might be helpful to remove a bit material of the plastic part at the indicated place.



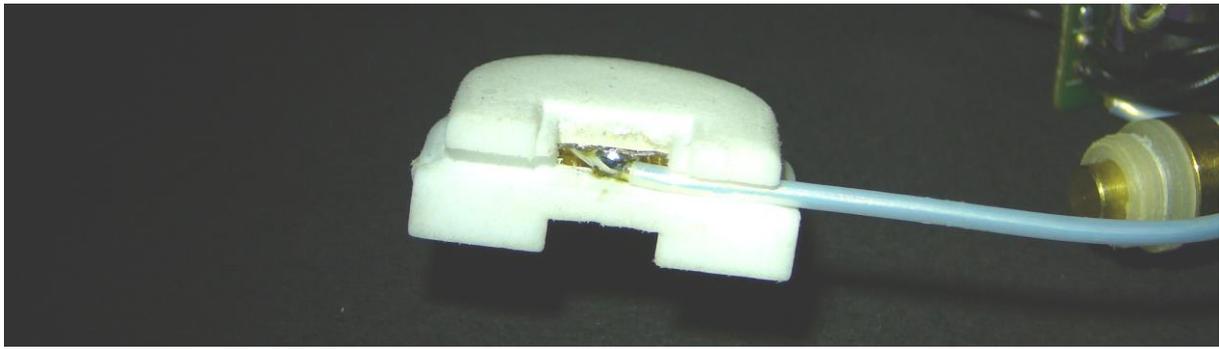
Then put the contact in place.



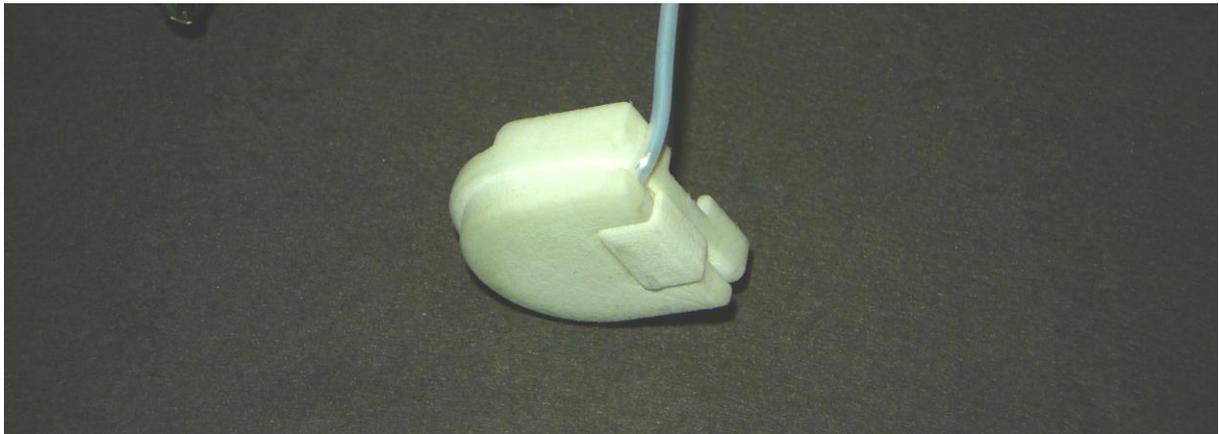
Bend the contact down on the other side.



Solder the positive battery wire on the connector.

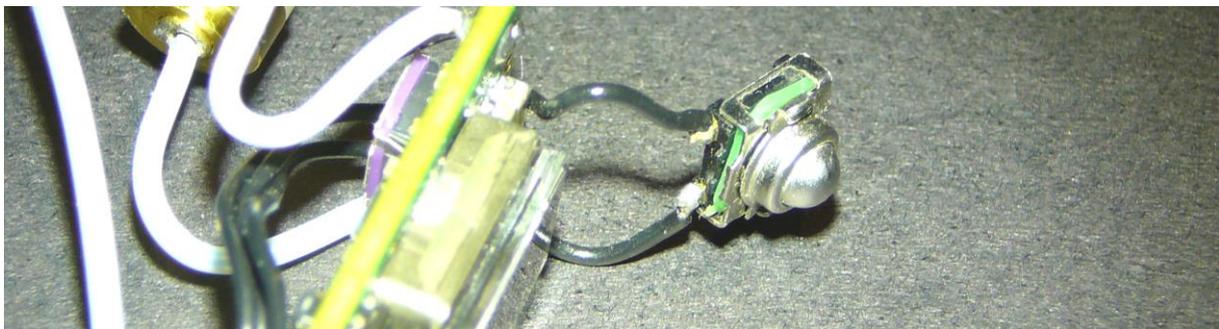


Bend the wire as shown and check that the positive battery connection compartment insulator fits well, and that the whole connector fits well and tight, when pressed into its place on the Theras housing.

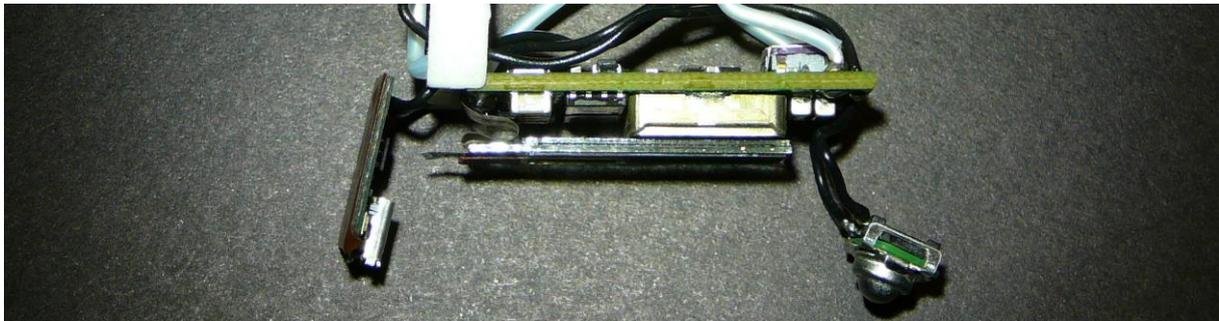


Assembling

Before assembling, put insulating tape on the bottom and front side of the USB charging board. Bent the USB charging board and fire button a bit down and forwards.



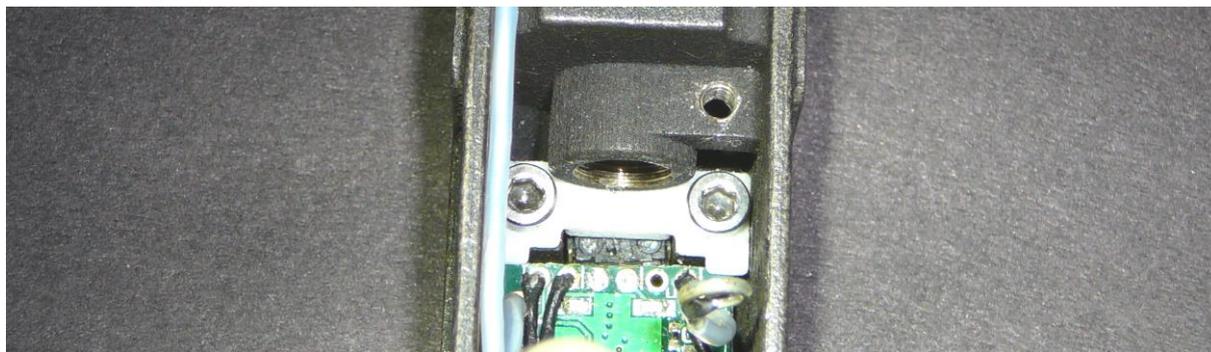
Put really thin double sided tape on the back side of the DNA display and attach the display to the DNA. The display should overhang the 0.68uH inductor on the top side by 0.5 to 1.0 mm. The flex connector between DNA and display should be bent like shown.



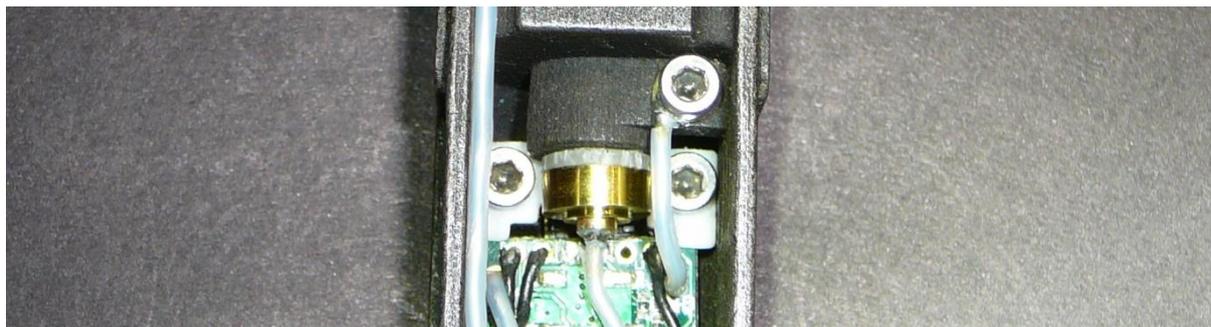
Before installing the complete DNA unit into the Thesas housing, I would suggest to test the board, the switches and the charging board.

Then mount the DNA into the Thesas. Start with the fire button and micro USB connector. Press USB board gently forward and then down, so that it snaps in its position. Bent the negative battery holder a bit up and the DNA board a bit back, so that the DNA display is not pressed against the front wall of the housing. Check that the fire button wires are free at the left and right side of the display. Now bring the up and down switches into their holes and push the negative battery holder plastic part in place. Now gently push the DNA board into its position while checking the DNA display. The DNA display should just touch the front wall.

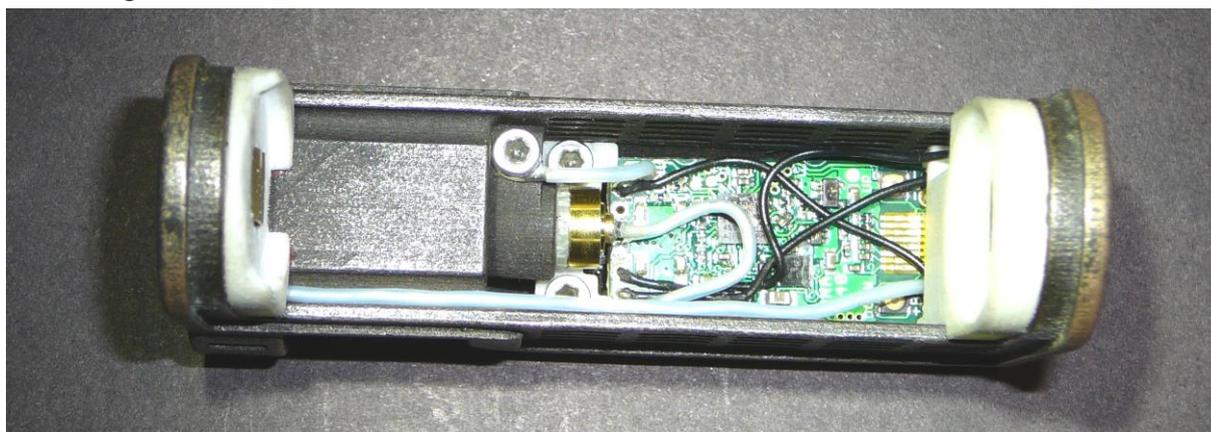
Now you might place and screw the plastic fire button holder,



the 510 positive connector and the ground wire.



Now it might look like this:



(Note, the mod shown here, is an old heavily used one, I had to replace the plastic fire button holder, since my first design of this plastic part was not appropriate.)

What you need to build a Thesas Mod

- Housing of the Thesas DNA40 mod
- strong and flexible plastic Thesas mod battery holder
- strong and flexible plastic bending template for the sleeve
- Evolv DNA 40D chipset with small display (<http://www.stealthvape.co.uk/electronic-cigarette-mod-parts/variable-voltage-boards/EVOLV-DNA-40D>)
- Evolv micro USB charging Board (<http://www.stealthvape.co.uk/electronic-cigarette-mod-parts/variable-voltage-boards/EVOLV-MICRO-USB-CHARGER>)
- Fat Daddy Vapes 510 V3 short core (<http://www.modmaker.co.uk/Fat-Daddy-Vapes-510-V3-Short-Core>)
- three Silver tactile switches with spherical actuator (<http://www.stealthvape.co.uk/electronic-cigarette-mod-parts/ecig-mod-parts-momentary-switches/SILVER-ROUND-300G-TACTILE-SWITCH>)
- two battery contacts of a Keystone #1042 Battery holder (<http://www.stealthvape.co.uk/electronic-cigarette-mod-parts/2xaa-3xaa-14500-18650-battery-boxes/KEYSTONE-1042-18650-SINGLE-HOLDER>)
- 84X75X1mm aluminum, copper or brass sheet
- 7X16mm of a prototyping board for mounting the up and down switch
- two M2,5x4 SS screws
- some 1mm silver coated copper wire
- some 1,07mm insulating hose
- some 0.5mm insulated wire for connecting the switches and the charging board
- some insulating tape

Other needful things:

- 6,5 mm drill bit and a M7X0,5 screw tab for the 510 connector
- 2mm drill bit and a M2,5X0,45 screw tab for the front switch
- a powerful soldering station (battery and 510 connections on the DNA chip need some power for soldering) lead-free solder and flux
- Tools like: file, saw, screwdrivers, wire cutters, vice (or vise)