VAMISOUND

THE SOUND
IS YOURS

V-414DC

BUILDING
INSTRUCTIONS

WE SOUND BETTER

Dear DIY friend,

first of all thank you for your support and choice of the VAMISOUND product.
We wish you a happy DIY and the joy of a new microphone in your arsenal!!

Jan and Milan

VAMISOUND V-414DC BUILDING INSTRUCTIONS

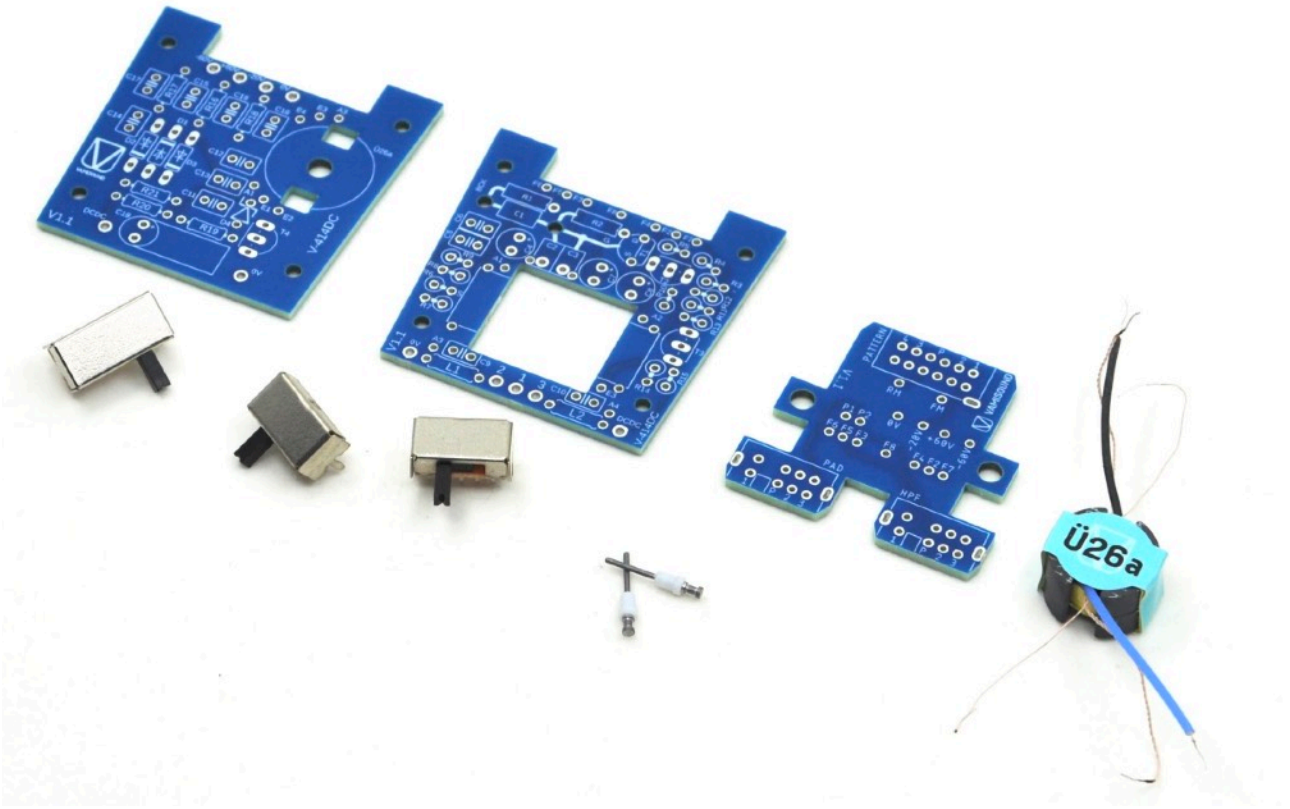
WE SOUND BETTER

Before you start building your new microphone please carefully read this building instructions.

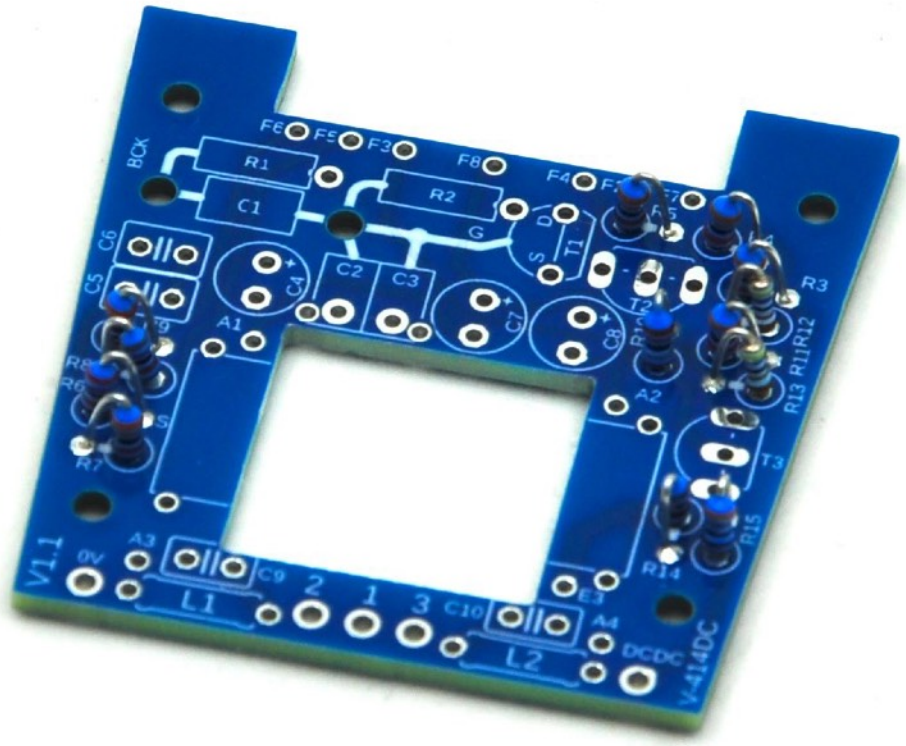
Attention: V-414DC is not DIY beginners project. This is due to the fact that the circuit is very complex and boards designed with very limited space in the microphone body in mind. Good soldering experience and soldering stations with very fine soldering tip is required for successful completion of the construction. If you do not have this, please delegate the construction to a more experienced technician with proper equipment. We are not responsible for malfunctioning construction or injuries associated with improper assembly of our kits.

Document info	
Document name	V-414DC building instructions
Document revision	1.0
PCB revision	1.0
Date	June 2025
Project difficulty	★★★★★
Complexity of soldering	★★★★★
Risk of electrick shock	★★★★★
Changes and notes	

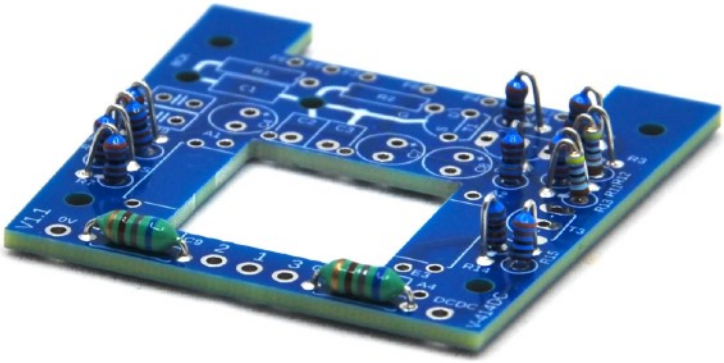
VAMISOUND V-414DC pcb set includes DC-DC converter board, transformer board, switch board, three switches, two teflon pins and small Ü26a transformer.



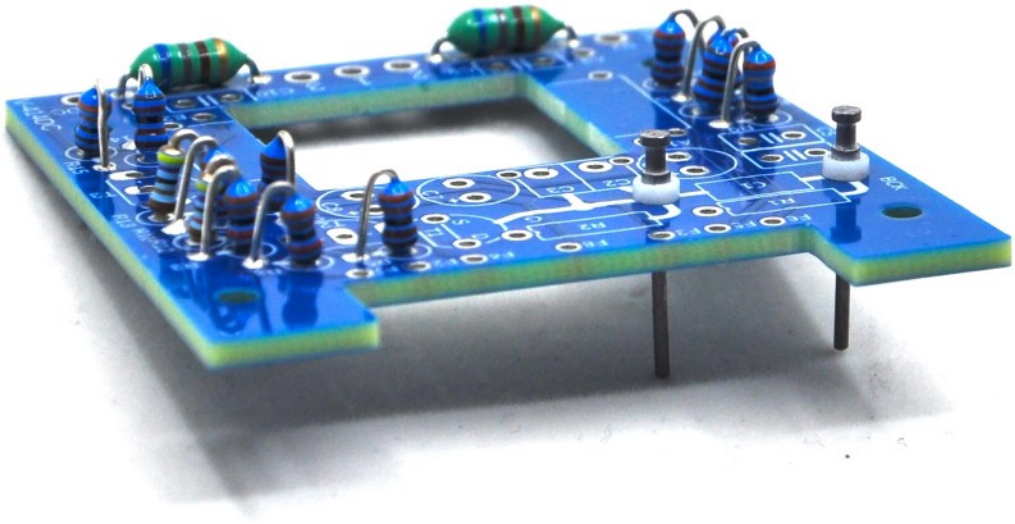
Start fitting the transformer board with resistors. Make sure it does not stick out too much above the board.



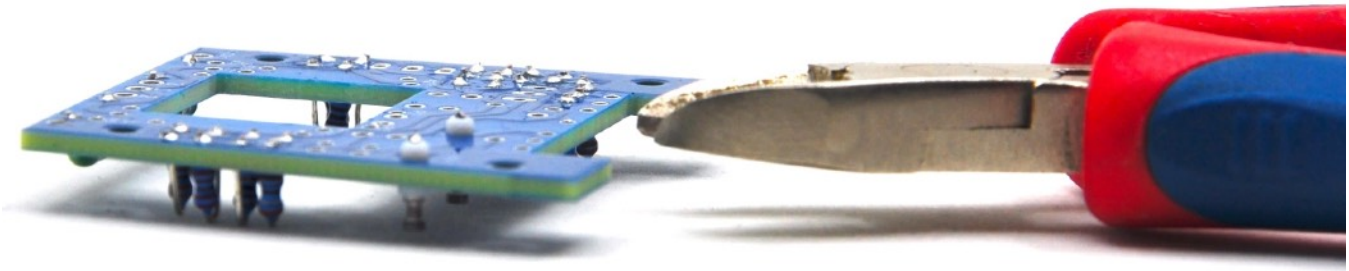
Now solder the two inductors flat.



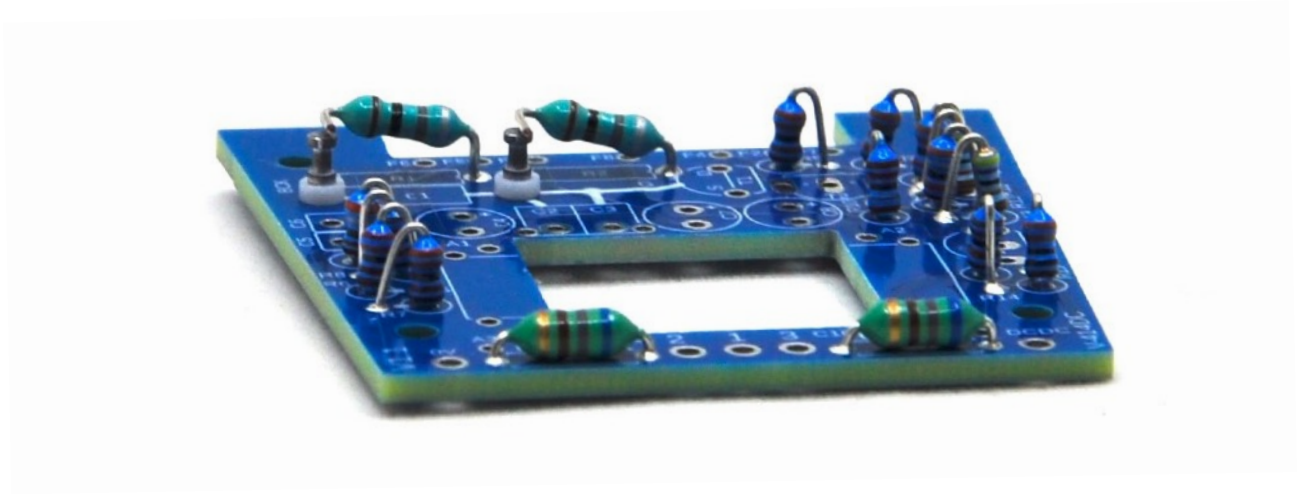
Proceed with the installation of the two teflon pins as you see in the picture.



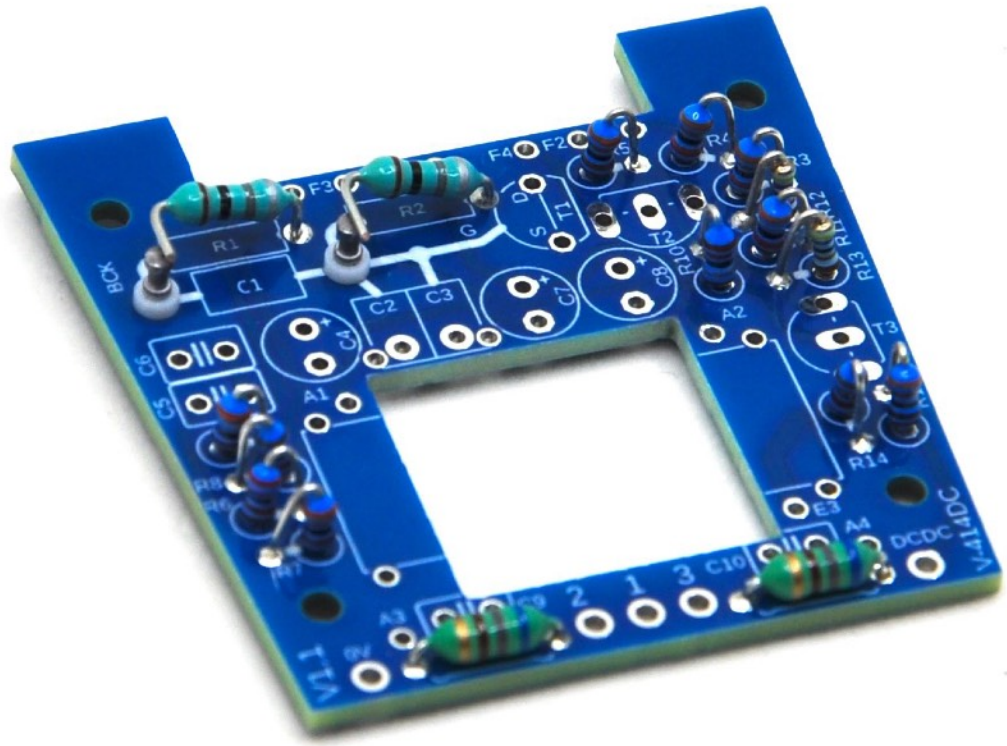
Cut off the excess parts of teflon pin with pliers as shown in the picture.



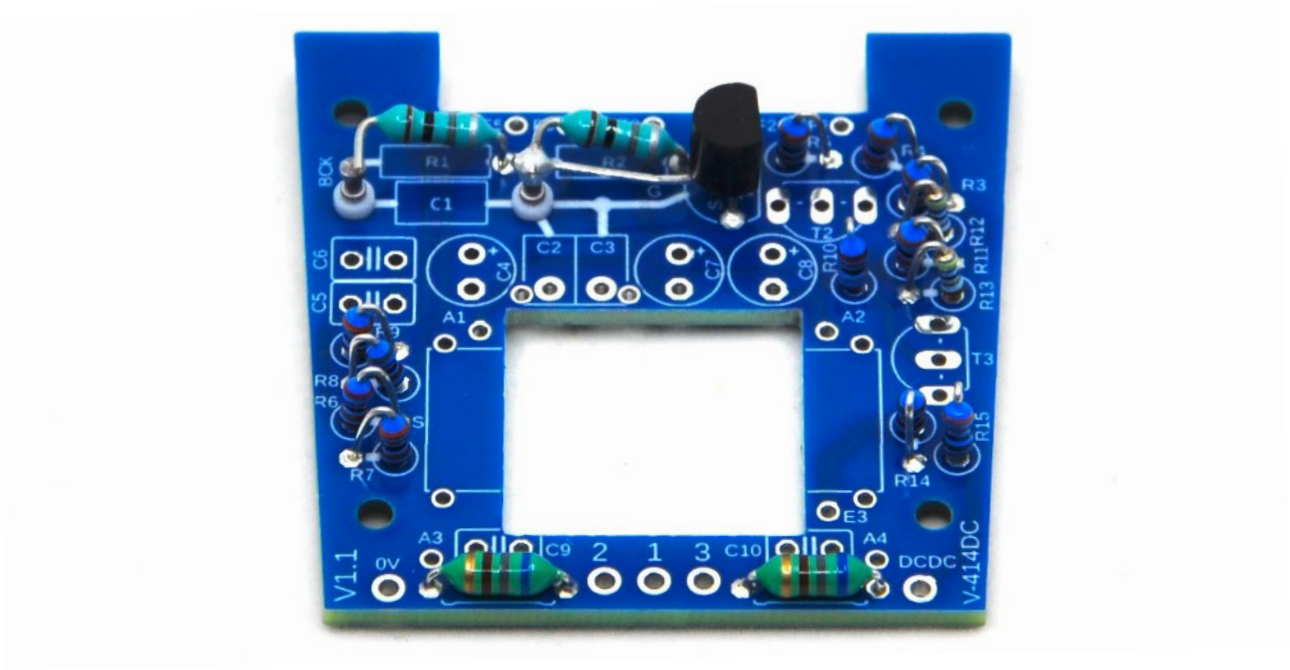
Now it is the right time to start working on the HiZ section. Start with two 1G resistors (R1 and R2) and install them similar to the pictures below.



The preprinted component outlines on the circuit board will help you. Bend the legs in a similar way as indicated.



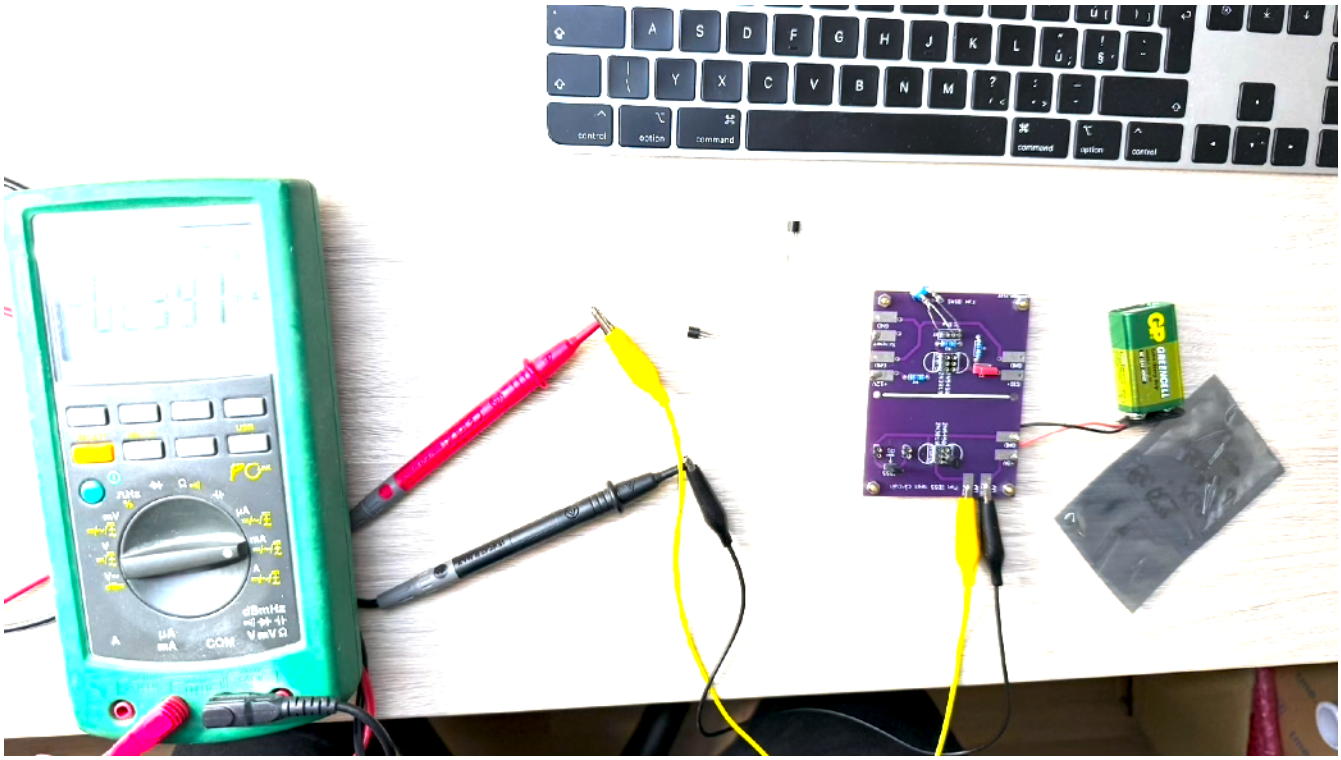
Install the 2SK30A-O input FET transistor with its middle leg leading to the teflon pin nearby. Everything is as if in the air, nothing touches the pcb surface.



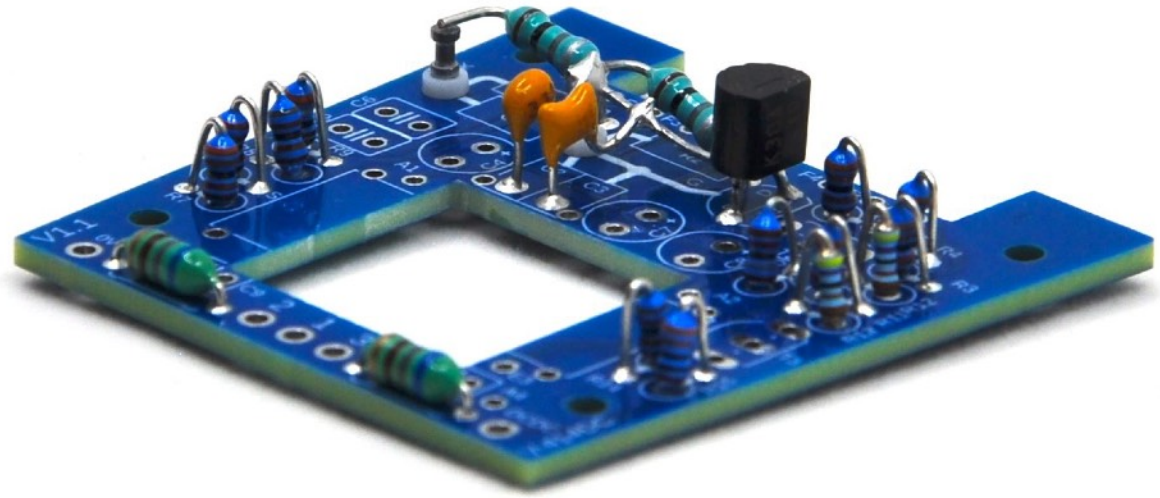
In the original C414EB with DC-DC converter microphone design (silver version of C414EB), FET 2SK30A-R was used. This "R" version is no longer practically available. Therefore, use the "O" version with the understanding that this one has IDSS values quite similar. More experienced builders can measure the IDSS and use values around 0.6 to 1.4 mA. Values from 0.6 to 0.75 mA are on par with the "R" version and if you can measure them, you have the values of the original. Here is an excerpt from the 2SK30A datasheet:

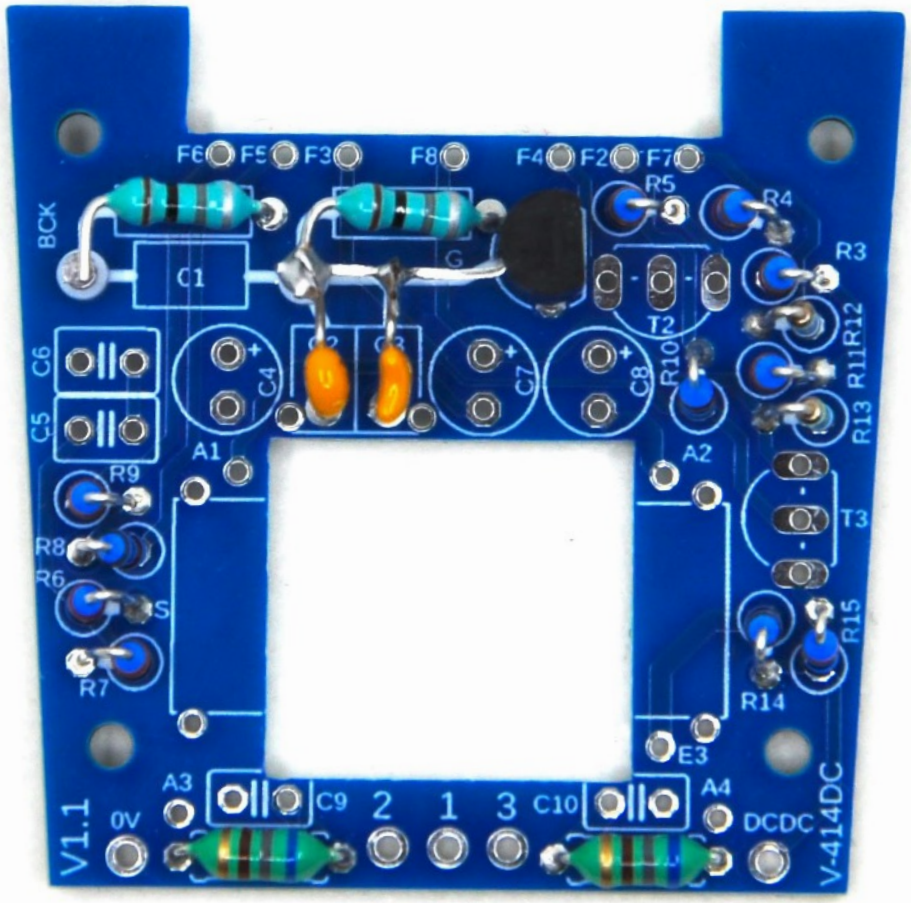
Note : I_{DSS} Classification R : 0.30~0.75, O : 0.60~1.40, Y : 1.20~3.00, GR : 2.60~6.50

Here is an example of the measured IDSS value of my "O" version..... 0.991 mA. I used this value in my microphone. Not in „R" version IDSS specs but it will work.

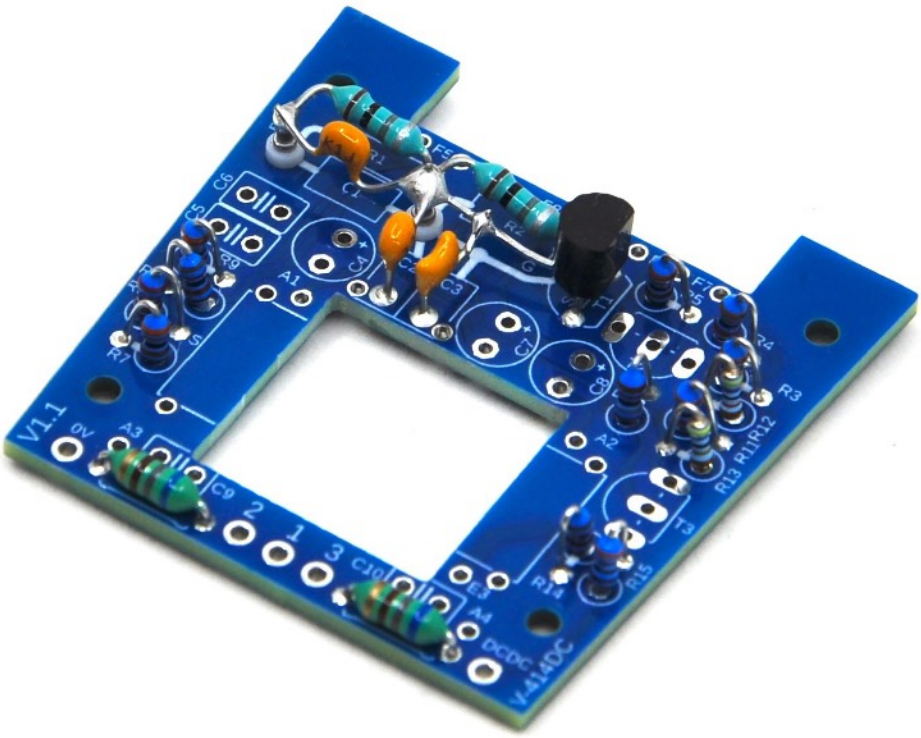


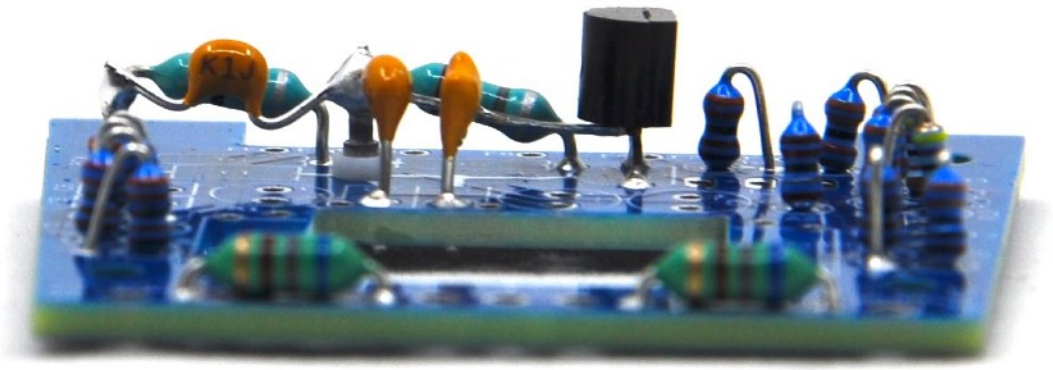
Now install two yellow ceramic capacitors in the HiZ section. These are the capacitors that form the PAD when they are connected to the circuit using the switch. Solder them "in the air" to the input FET transistor GATE leg.



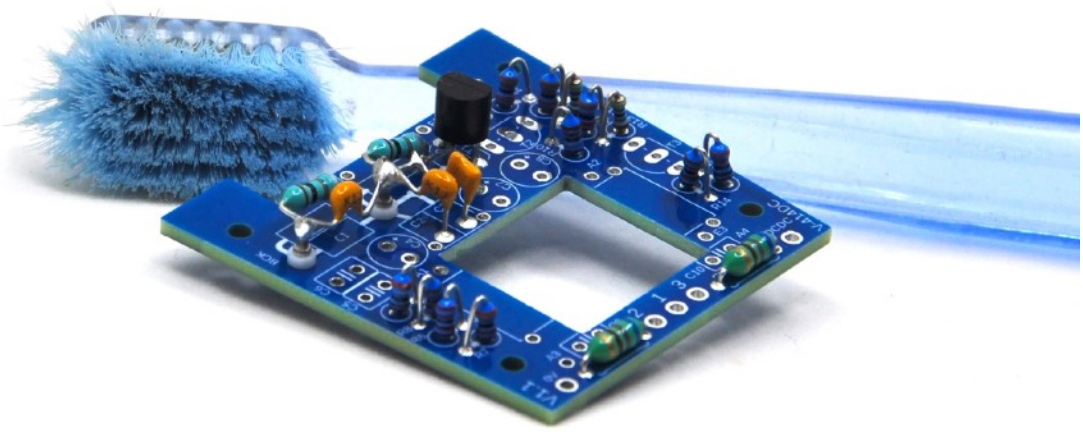


Now the last yellow capacitor left is C1. Make sure it is nicely down and doesn't stick out too much.

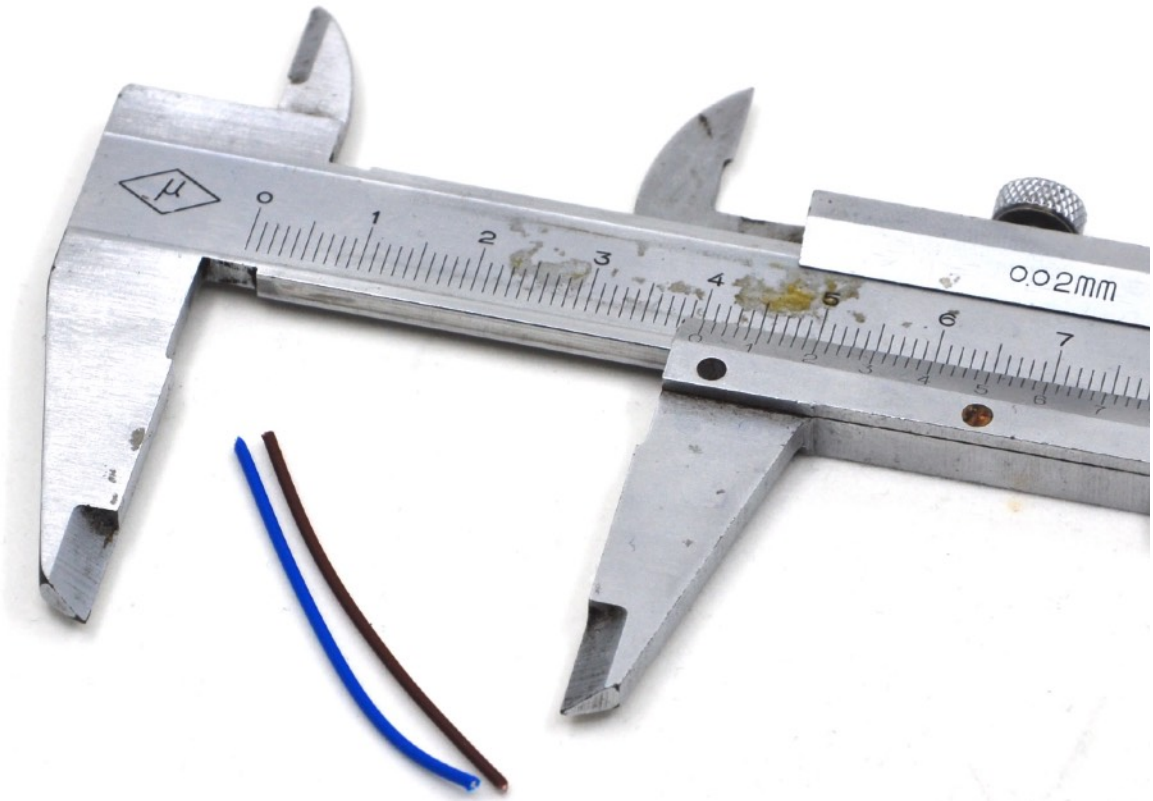




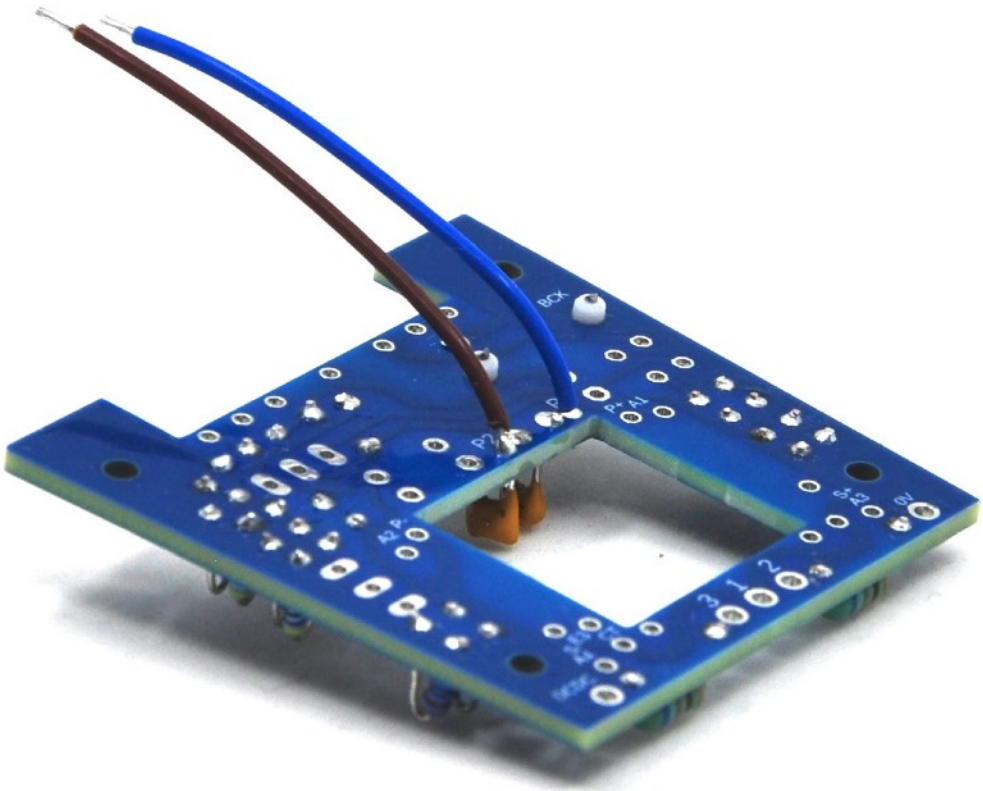
Now is a good time to clean the entire board and HiZ section with isopropyl alcohol. Everything needs to be nice and clean so it doesn't cause noise problems later.



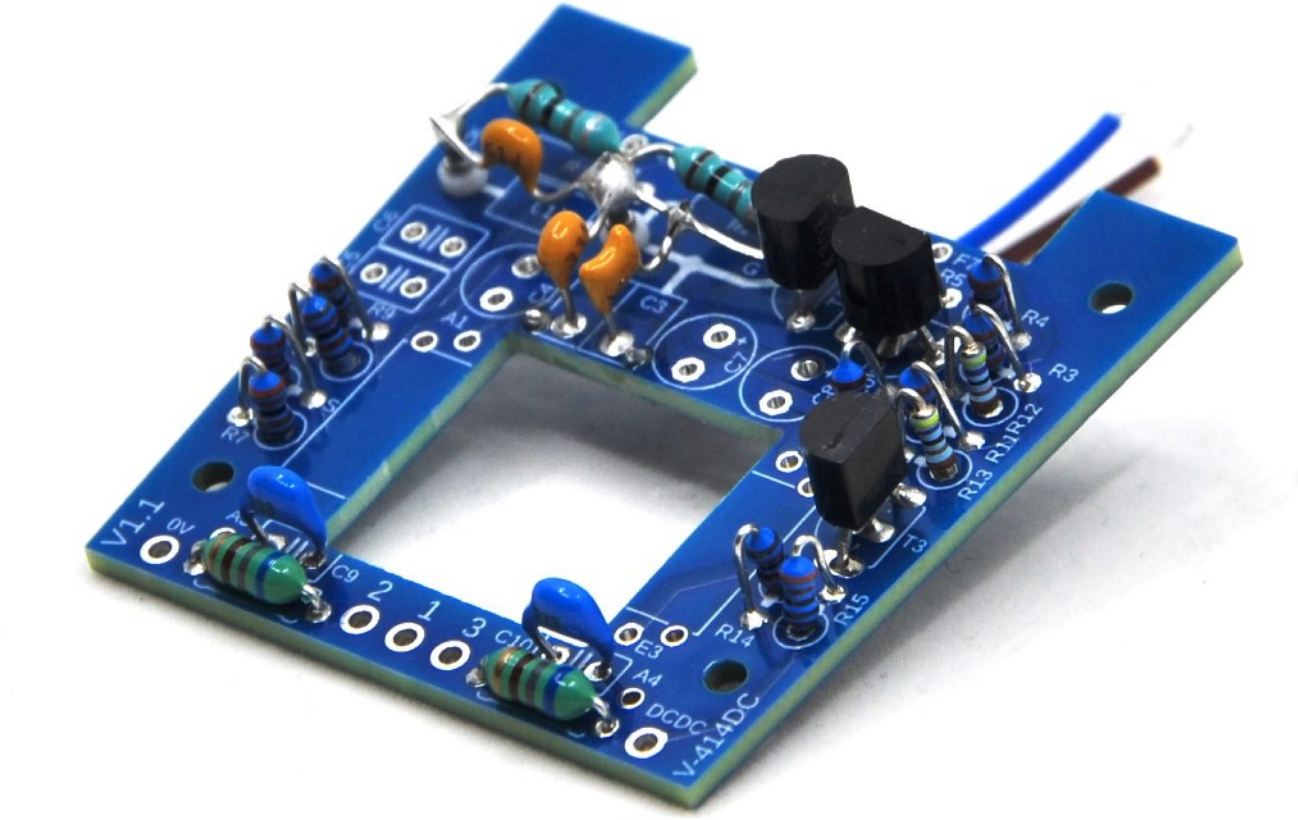
Prepare two wires about 40 mm long.



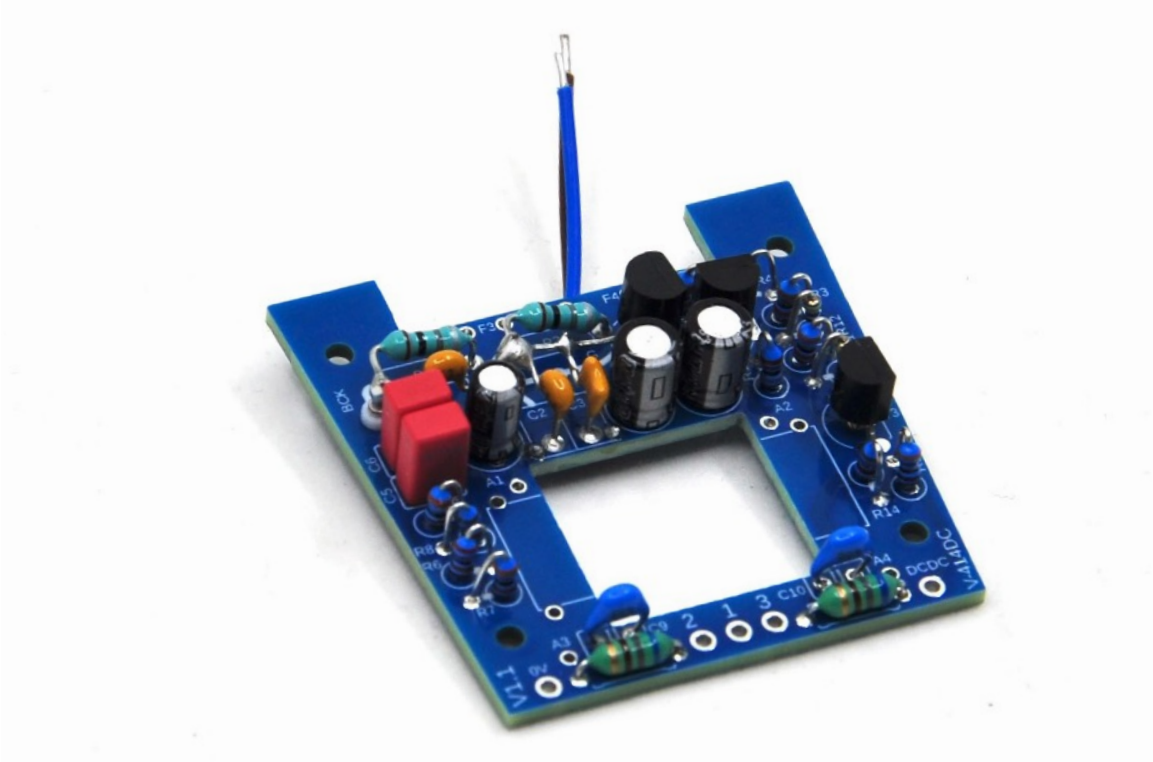
And solder them to the board from the underside in P1 and P2 positions. These cables will later be used to connect to the switch board.



Solder the remaining transistors and the two blue capacitors C9 and C10.

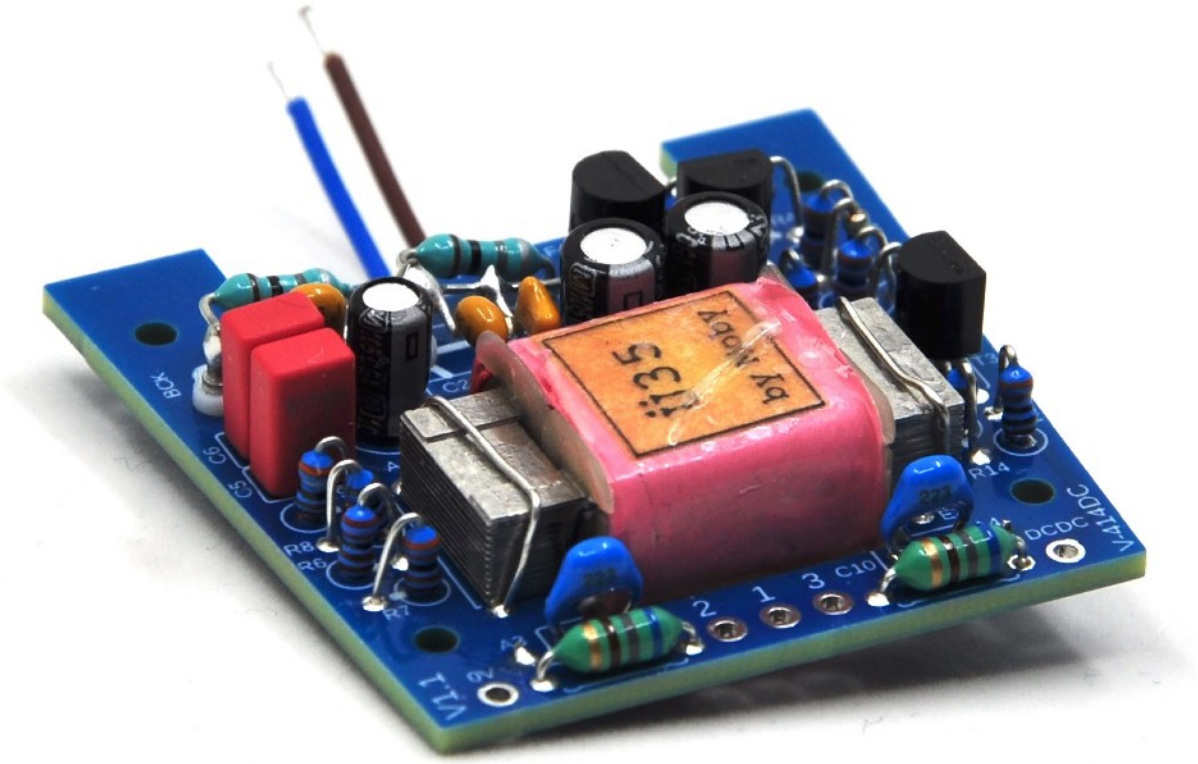


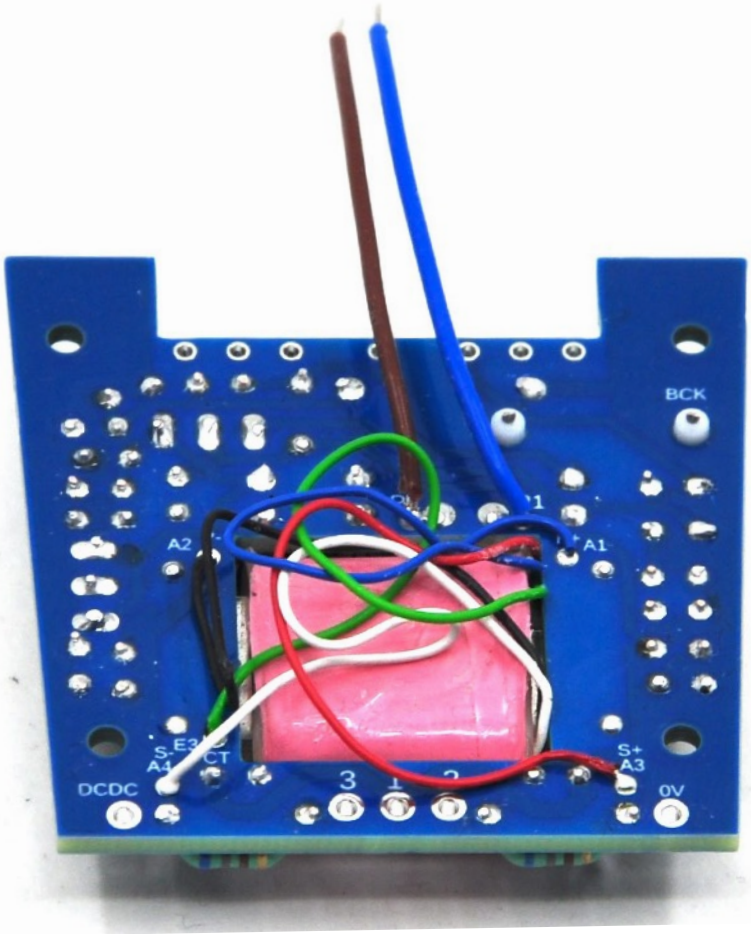
Now only two red film capacitors and three electrolytic capacitors are left. For these, pay attention to their position – the shorter minus the leg towards the transformer cutout just as you see in the picture.



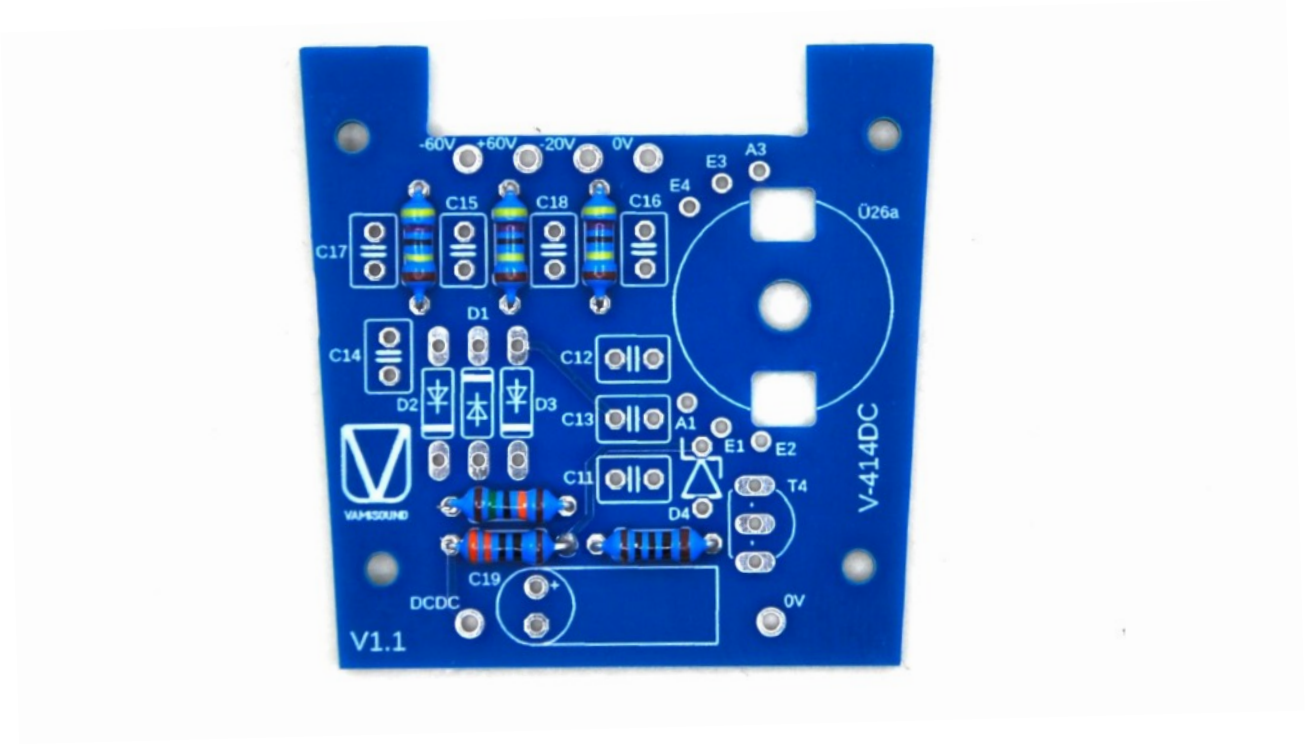
At this stage it is possible to give the whole board a final cleaning with isopropyl alcohol to make everything perfectly clean. Don't underestimate cleaning!

Now all that's left is Moby's Ü35 transformer. Solder the blue wire to A1 (P+) pad on the circuit board, black to A2 (P-) pad, green to CT (E3) pad, white to A4 (S-) pad and finally red to A3 (S+) pad.

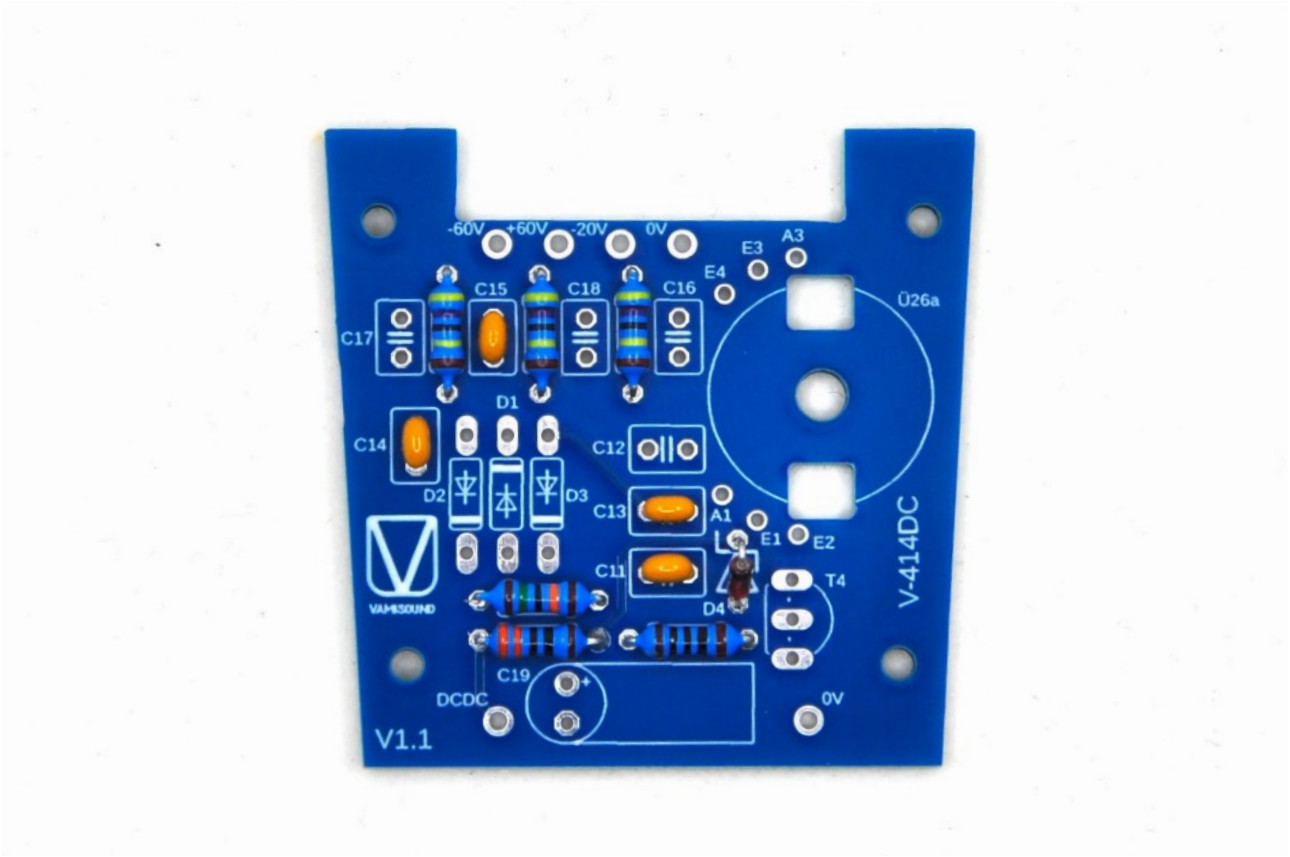




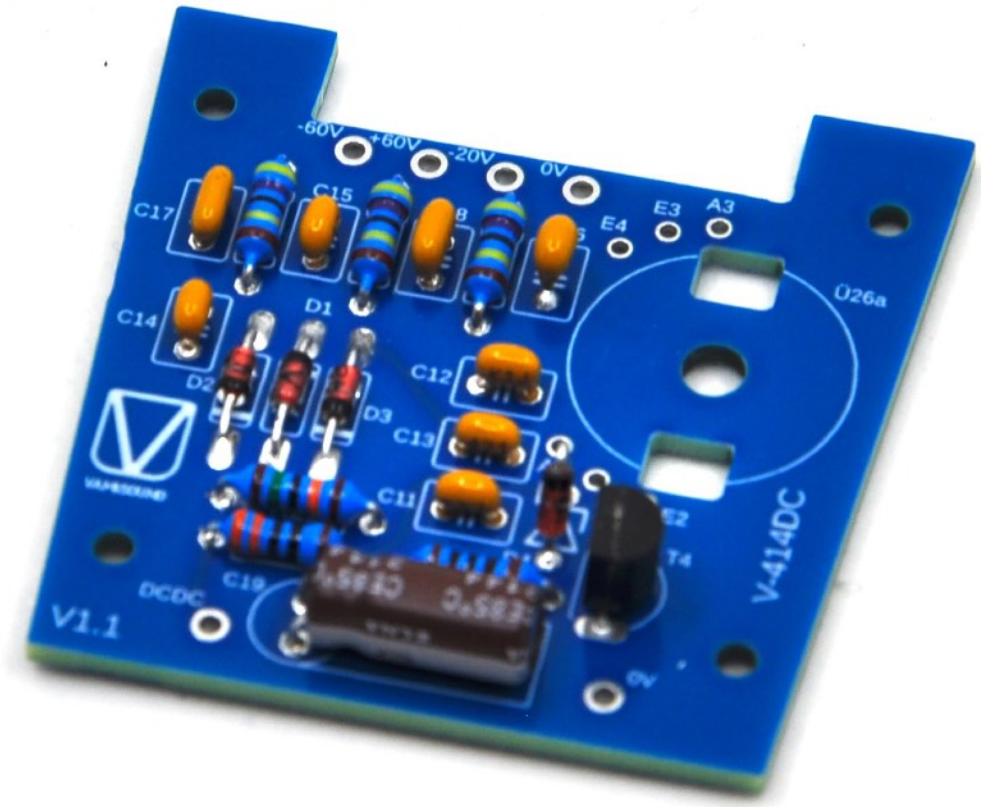
Now we go to the DC-DC converter board. We'll start by soldering all the components one by one. Start with resistors first.



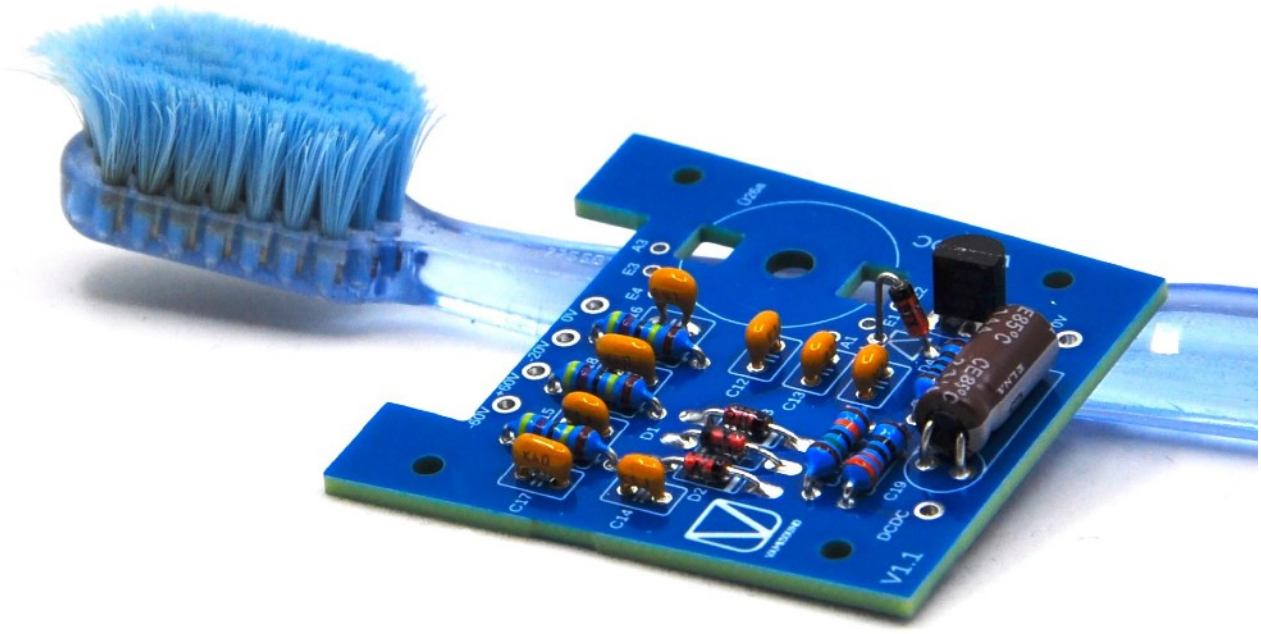
You continue with yellow ceramic capacitors and a zener diode.



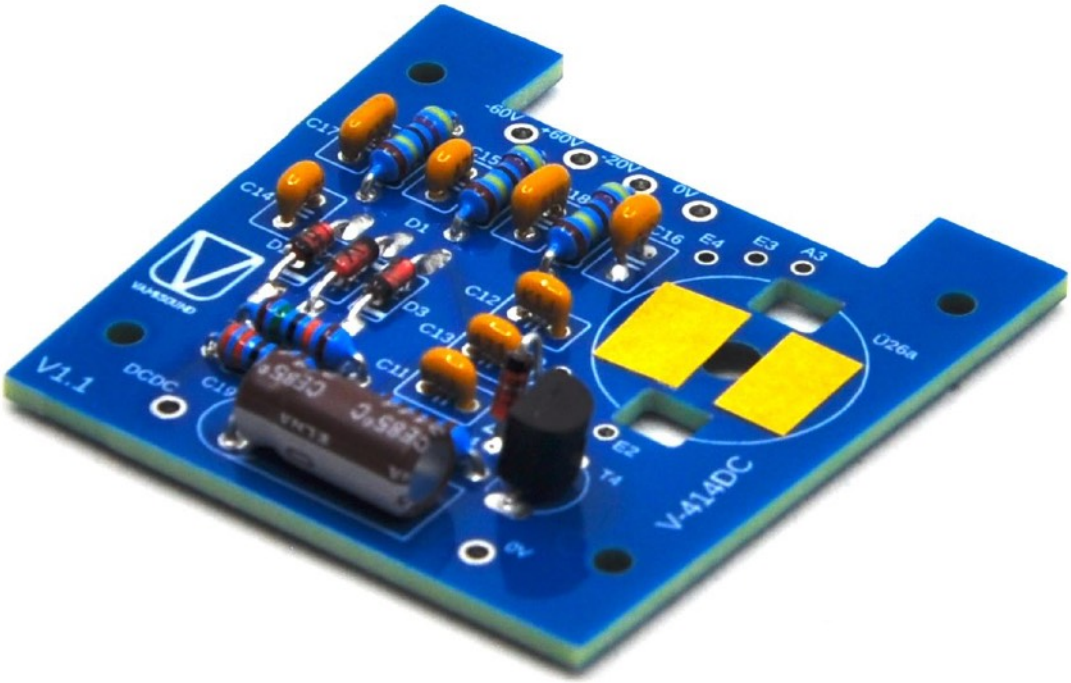
All that's left is to install the diodes, transistor and one electrolytic capacitor. Again, watch out for its plus and minus legs.



Clean the pcb thoroughly.

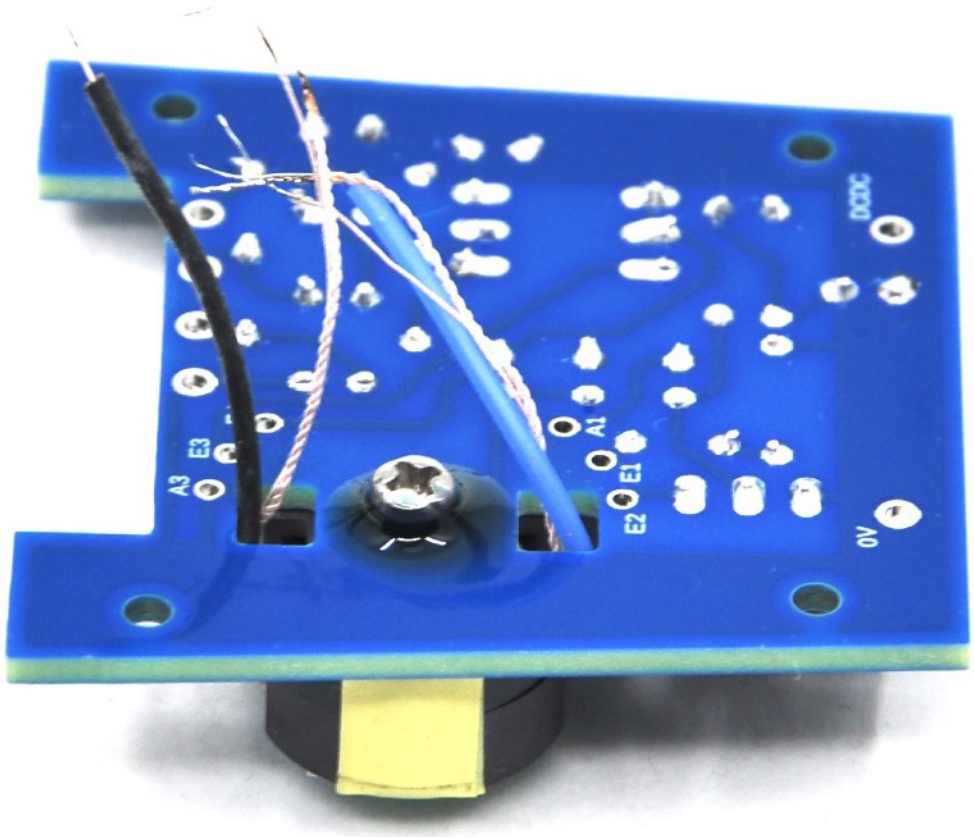


If you have double-sided tape, you can install it as shown in the picture. It will help hold the Ü26a transformer in place.

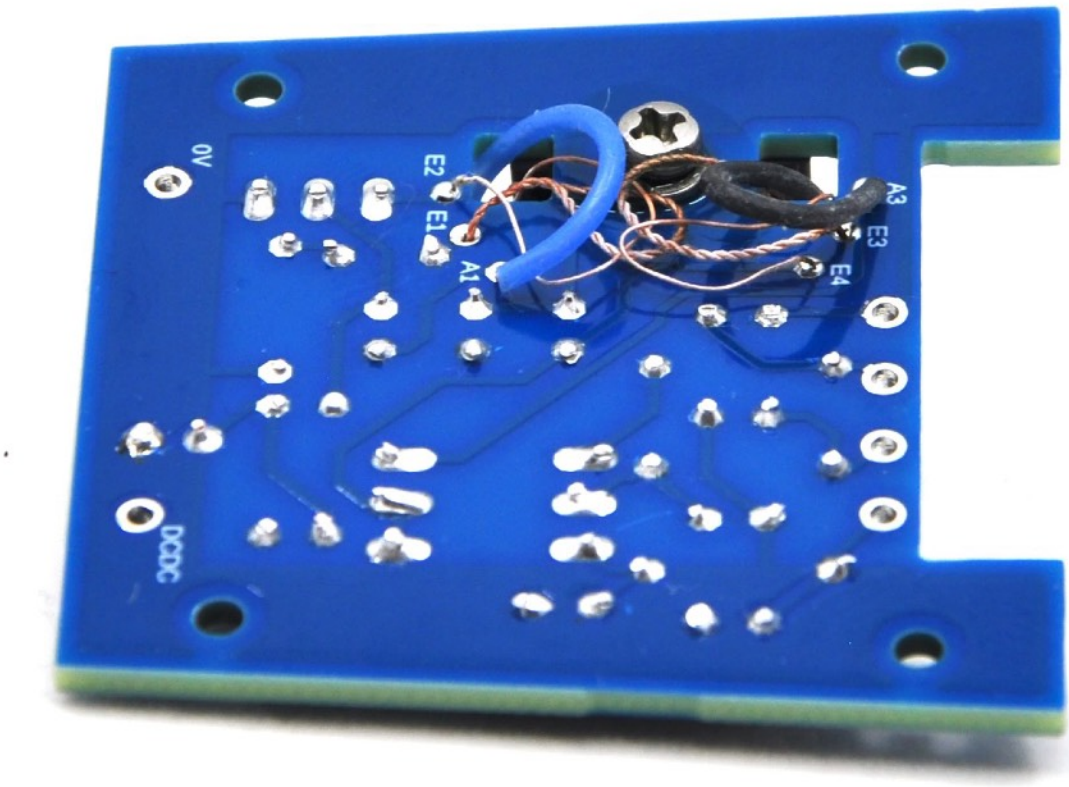


Carefully thread the transformer wires down through the printed circuit board's holes. Be very careful. The wires are hair thin (just like on the original).

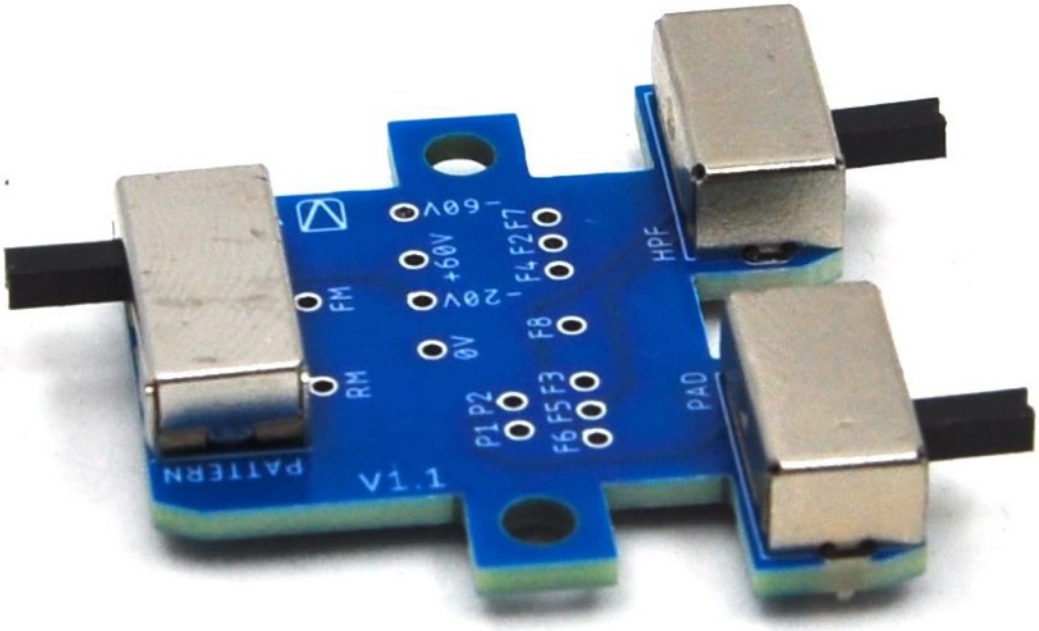
Screw the transformer to the back of the board with a 6 mm long M2 screw. If you have screw glue, use it and fix the screw. This will prevent it from coming loose later.



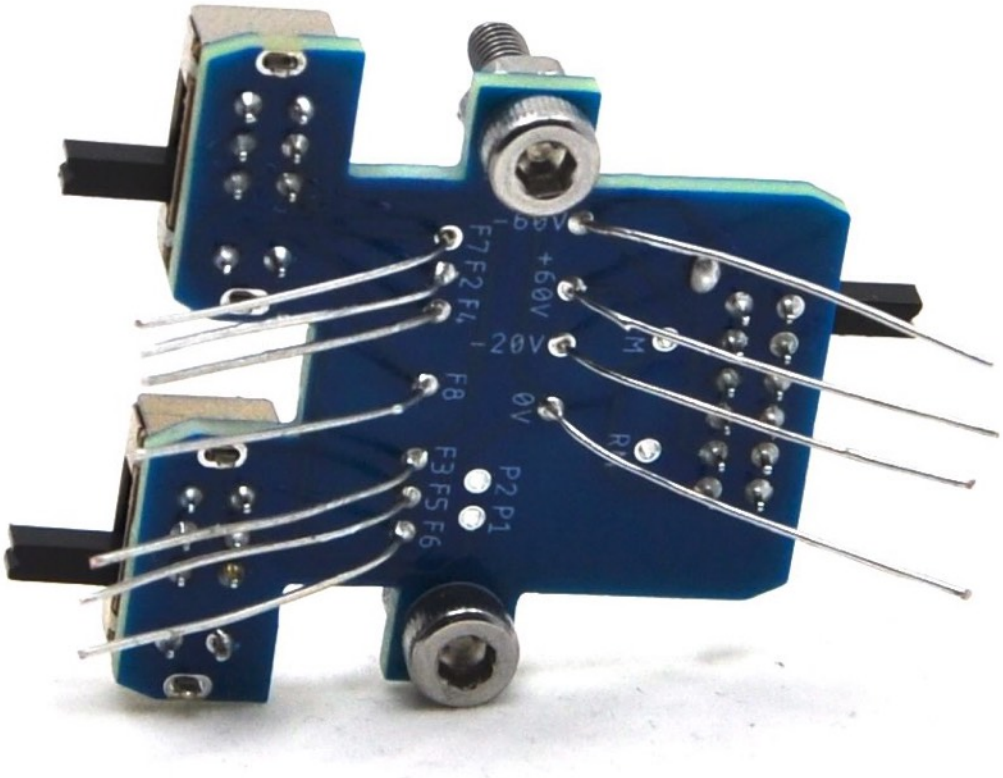
Now CAREFULLY solder the wires to the board. Note where the blue wire is and where the black wire is.



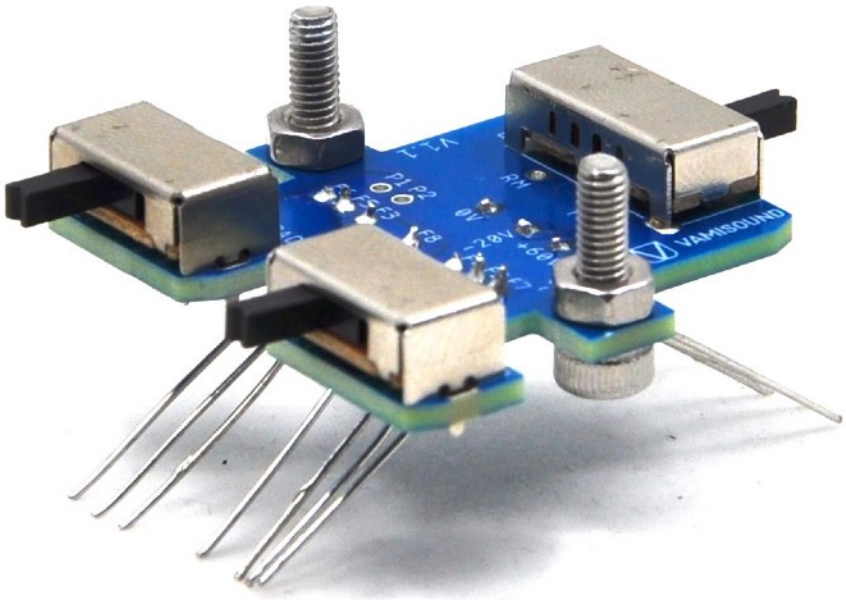
Install all three switches in their positions. Solder them slowly. Take your time. They don't like a lot of heat. On the large polar pattern switch, remove the one ground leg that runs from the switch chassis to better position the switch on the board.



Now solder the remaining legs from the resistors as you see in the picture. Note this is from the bottom side. Add two M3 screws about 10 mm long, which you fix with a nut from the top side.

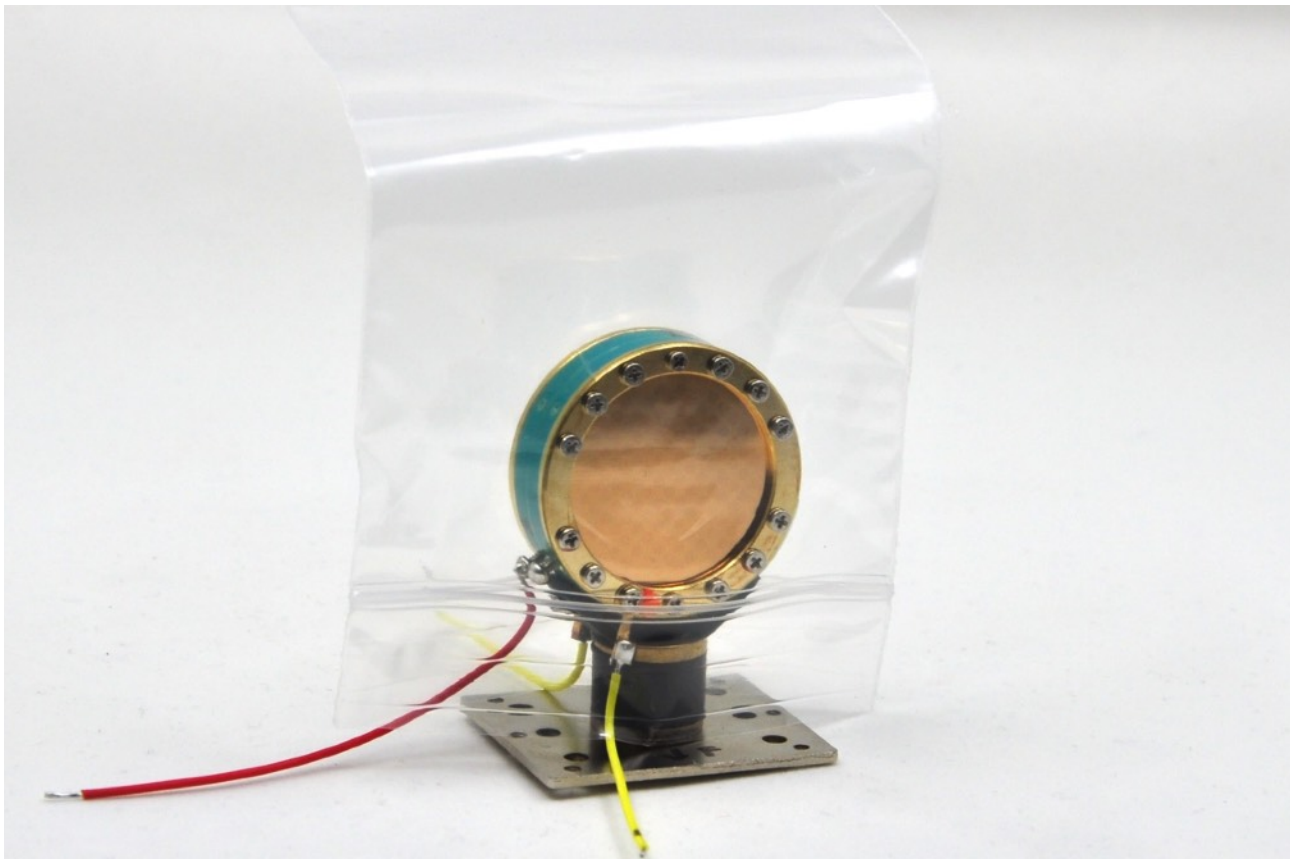


It's like it came from Starwars, right?



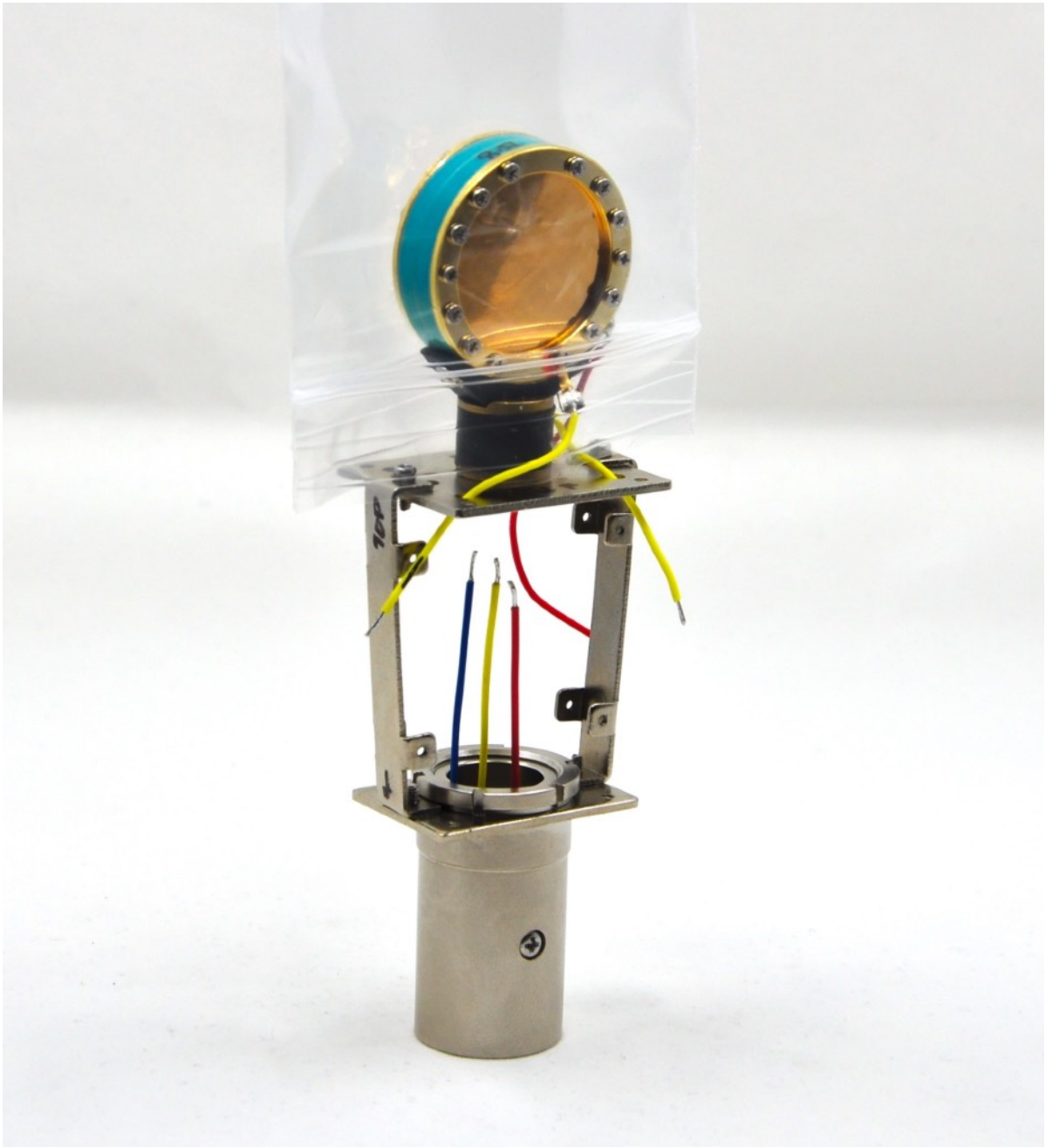
Now prepare the capsule. A capsule with a single backplate is sufficient for this build. Always be careful and cover the capsule with a bag, for example. Prepare three wires to be soldered to the front membrane, back membrane and backplate of the capsule. Screw the capsule stand to the pcb before removing it from the 414 body chassis.

Of course, you can also use C12 capsules with electrically separated backplates, which are connected e.g. with a short wire to make them look like one single backplate.



Unscrew the XLR insert from the body and solder three wires to it. Be sure to connect Pin 1 and the ground lug using the resistor foot.

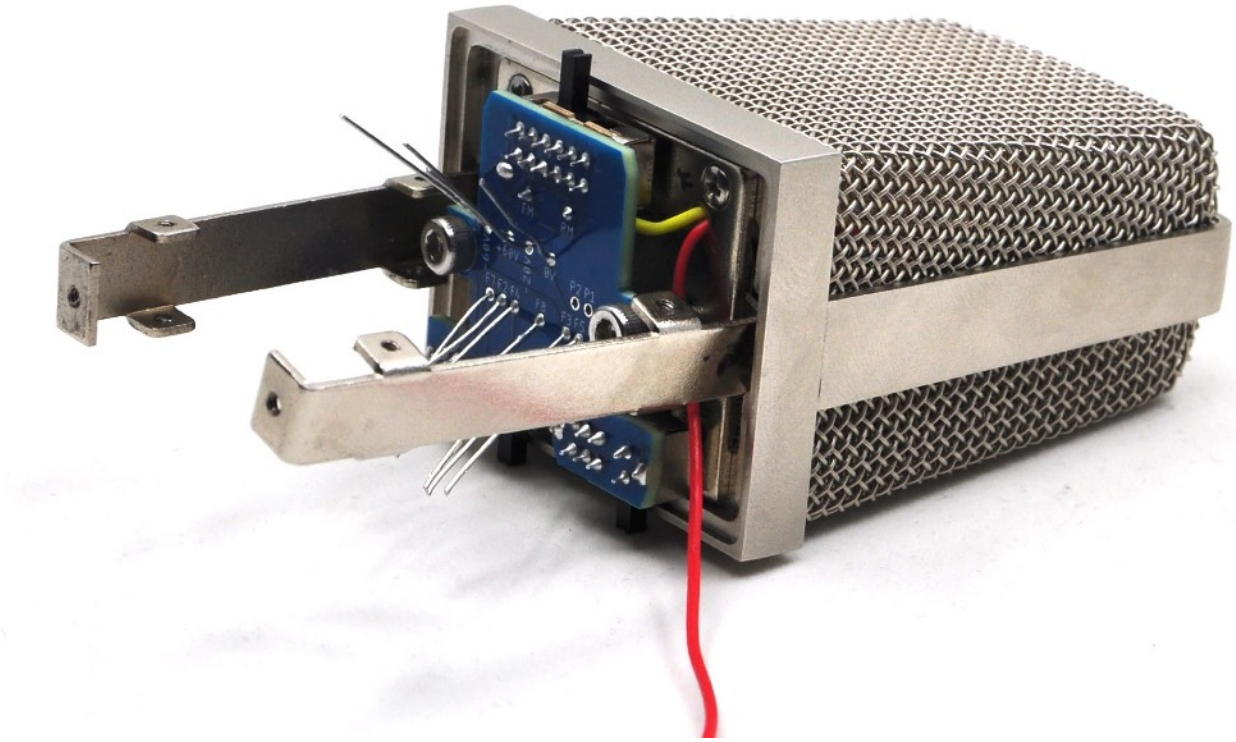
Here you can see both back in the chassis.



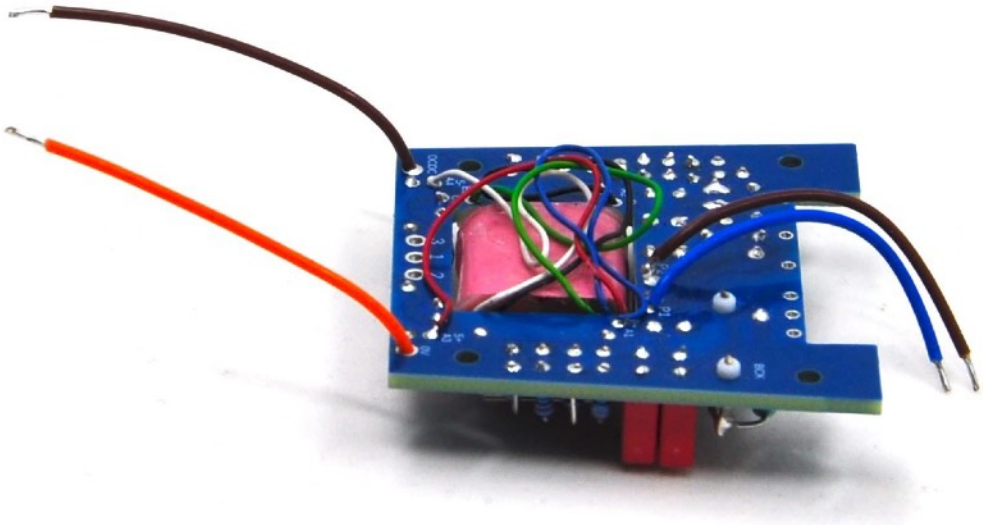
You install the head basket of the microphone to have a protected capsule. I used all 4 screws for this.

Take the two cables that lead from the capsule and connect the cable from the front membrane to the "FM" pad on the switch board and the cable from the rear membrane to the "RM" pad on the switch board and solder them from the underside.

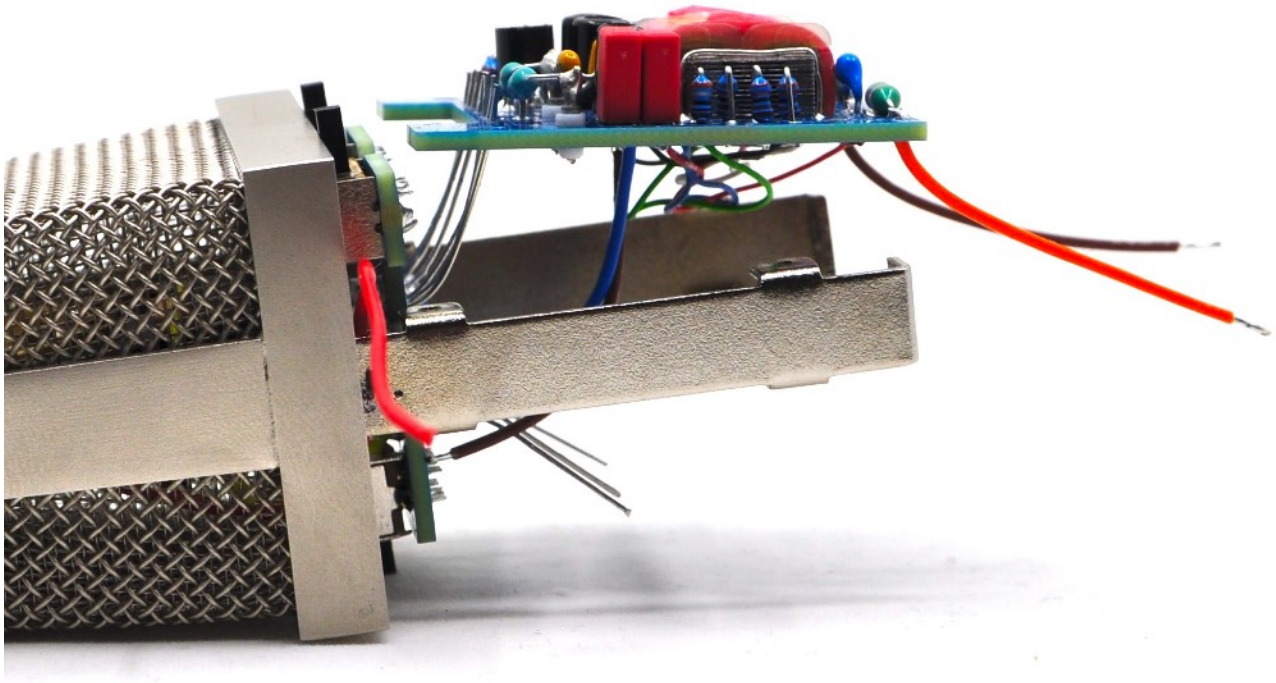
And now it's time to install the switch board. You can help yourself by unscrewing the entire bottom of the microphone to make it easier to install. Insert the two screws (the ones that lead up from the switch board) into the appropriate holes on the metal body plate under the head basket. Don't screw them in, just insert them into the holes. The red cable in the picture is the cable that leads from the backplate of the capsule. Leave it sticking loose outside for now. If something is not clear, take a look at the wiring diagram at the end od these instructions.



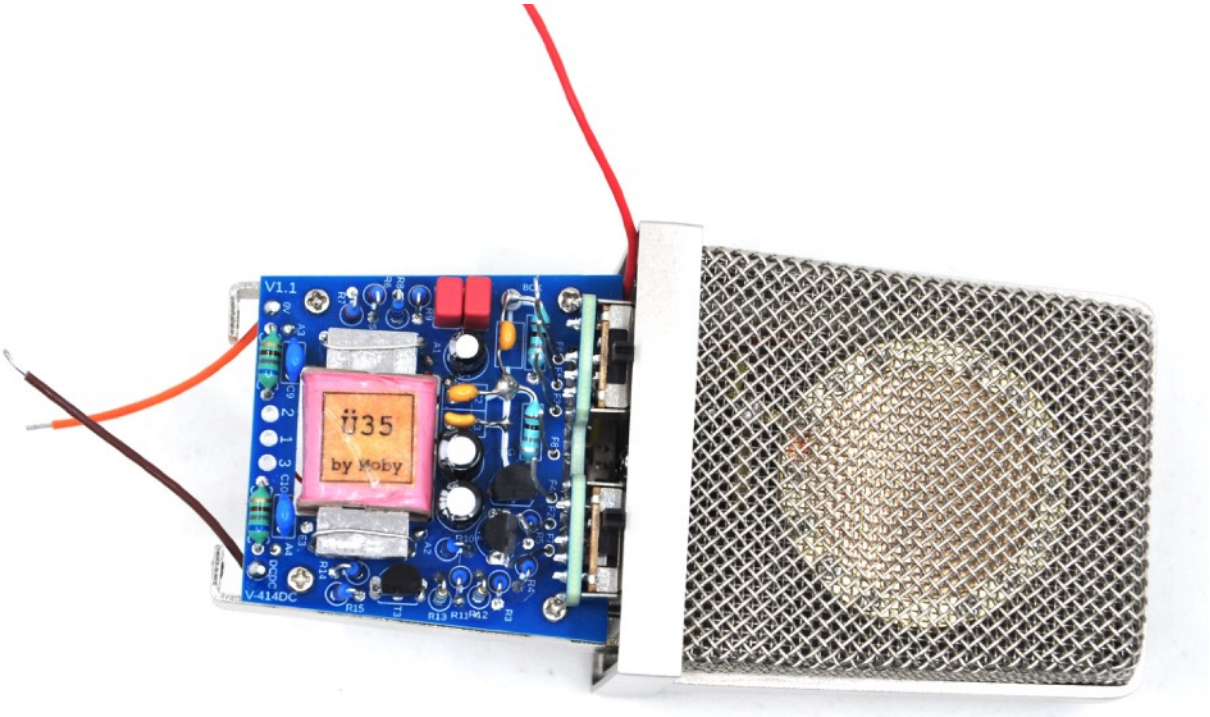
Solder two 40 mm long wires to the 0V and DCDC pads on the transformer board, which will be used later to connect to the DC-DC converter board.



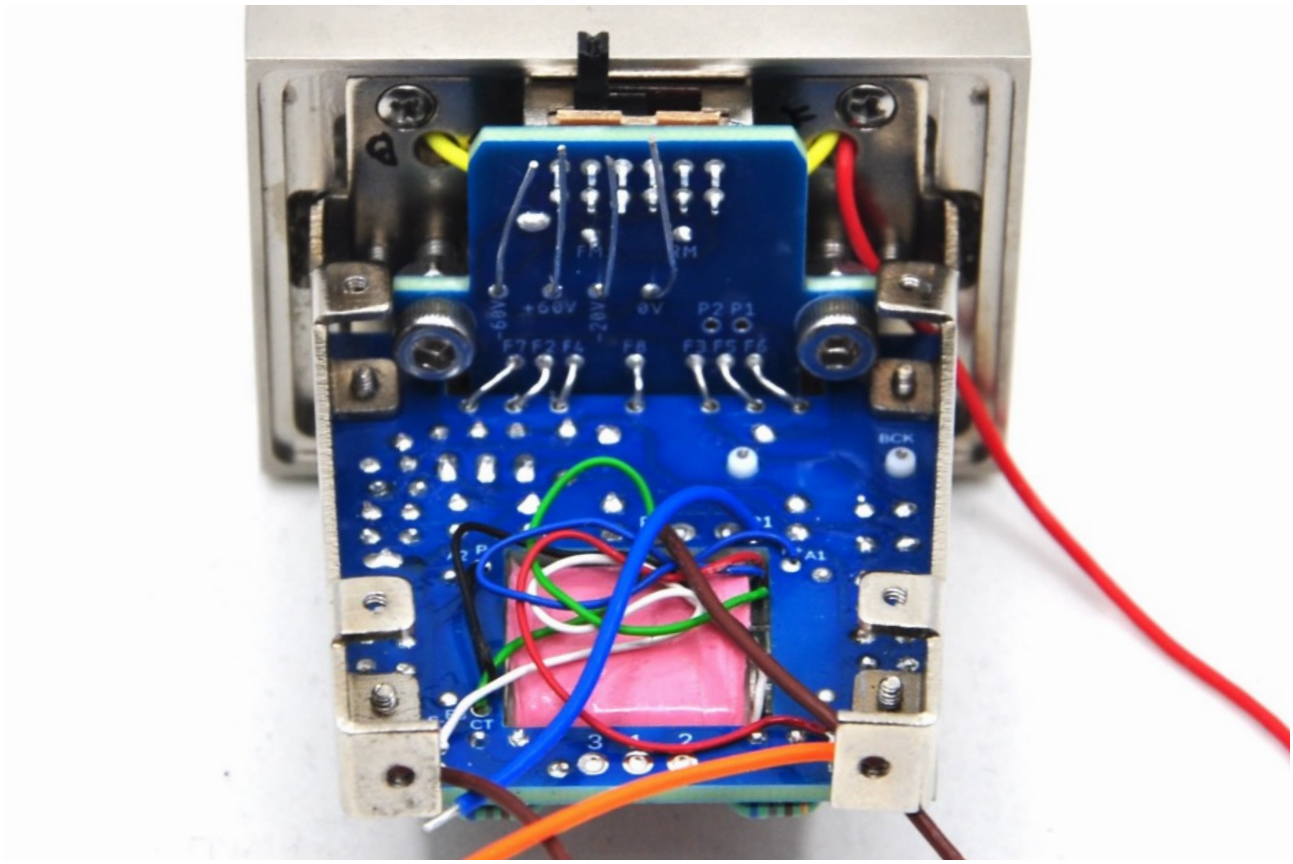
Now take the prepared transformer board and place it on the 7 resistor legs that stick out of the switch board. Carefully slide it in.



Secure the plate with 4 pcs of 6 mm long M1.8 screws.

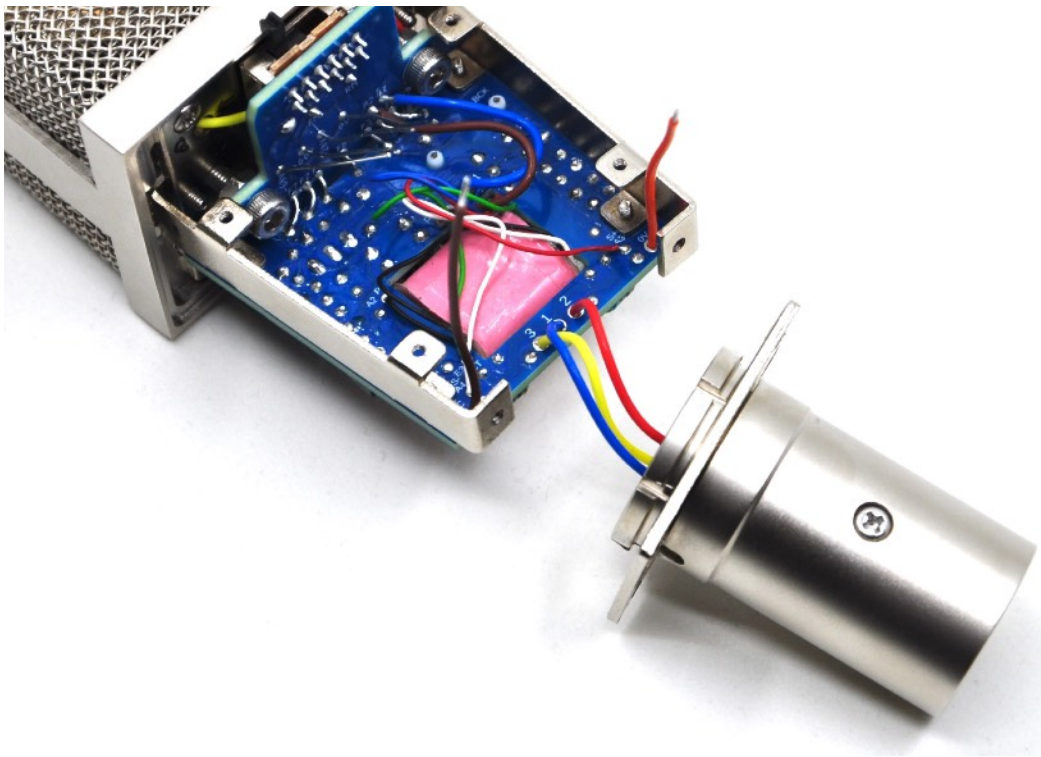


Now carefully solder the 7 resistor legs from the inside to connect the switch board with the transformer board. Visually check that these connections are OK, there is no contact between the legs or to the chassis.

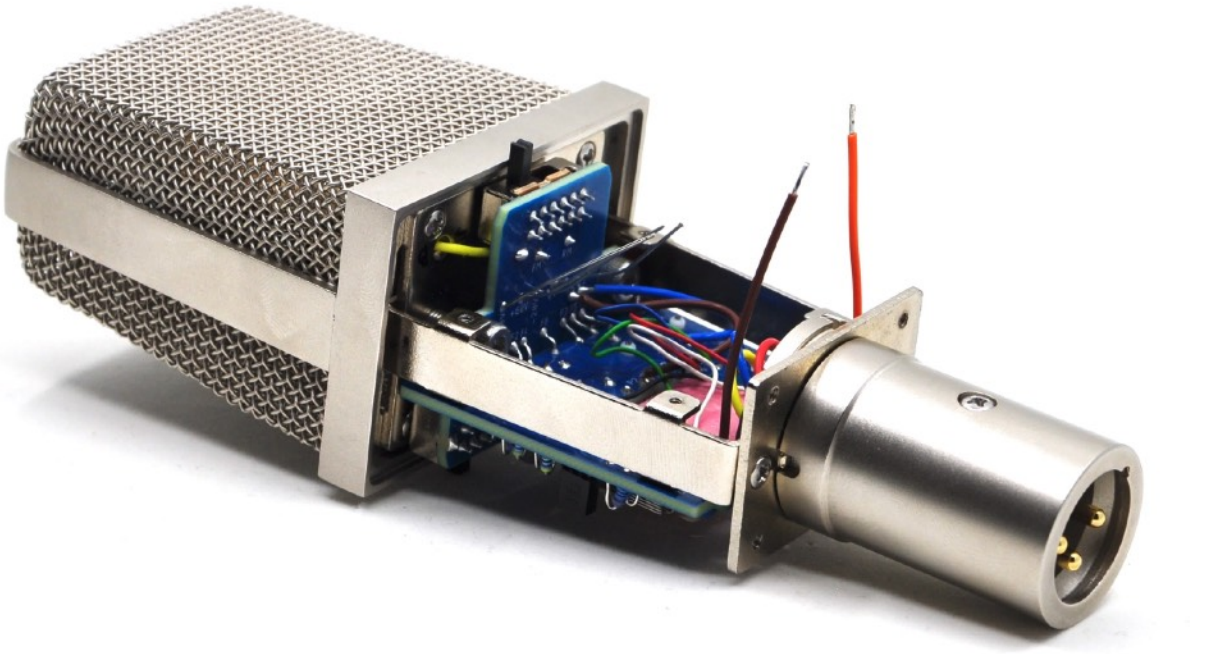


From the other side of the board, carefully cut off the excess resistor legs that were used for interconnection.

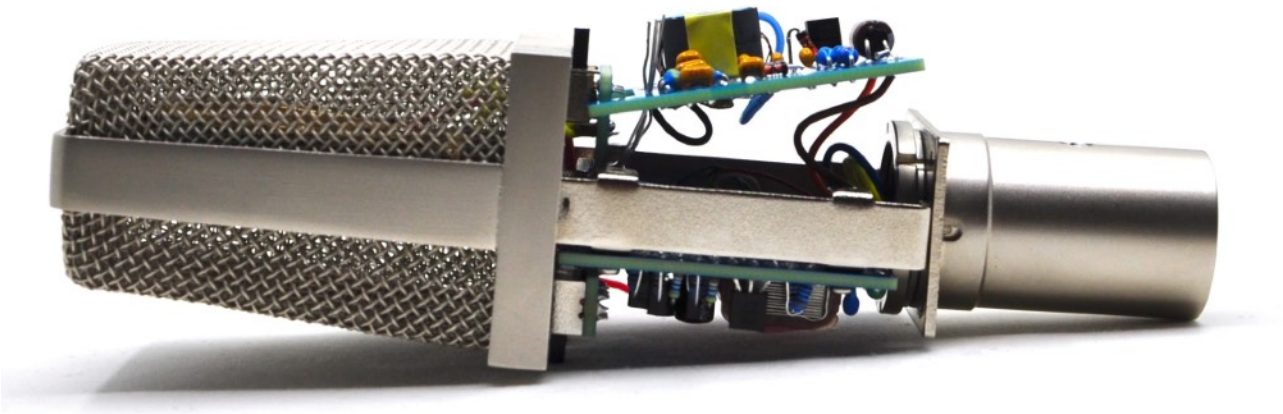
Now connect the XLR part to the transformer board. Pin 1 of XLR insert into pad 1 on the board, Pin 2 into pad 2 and Pin 3 into pad 3. Also solder two wires (blue and brown) to pads P1 and P2 (that lead from the transformer board) to the switch board.



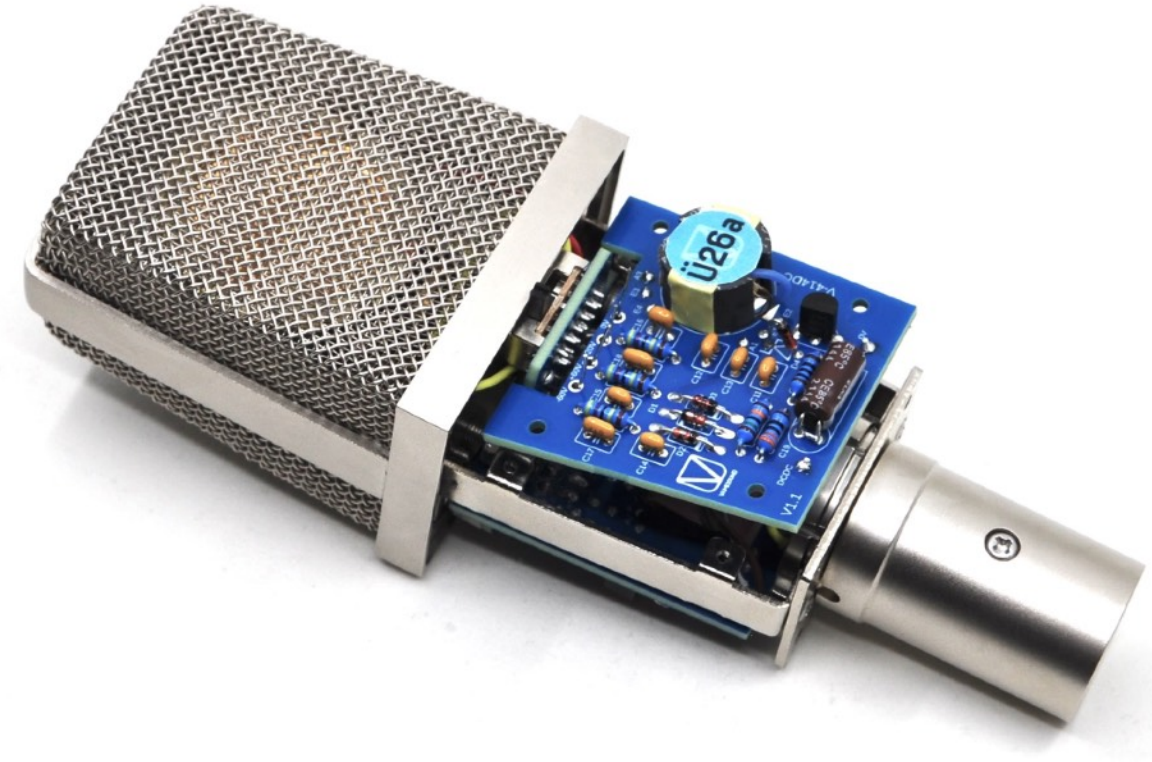
Carefully screw the XLR part of the microphone body to the rest of the chassis.

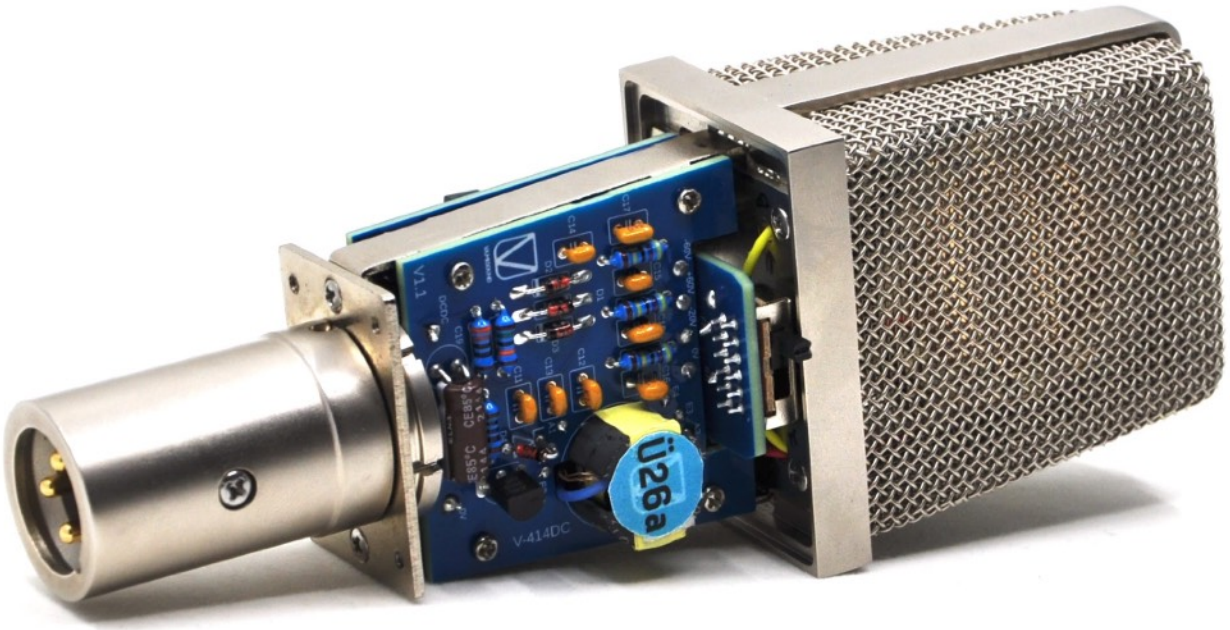


Now carefully slide the DC-DC converter board onto the 5 resistor legs that lead on the other side from the switch board. Also solder the two cables leading from the transformer board to the DCDC and OV pads on the DC-DC converter board.

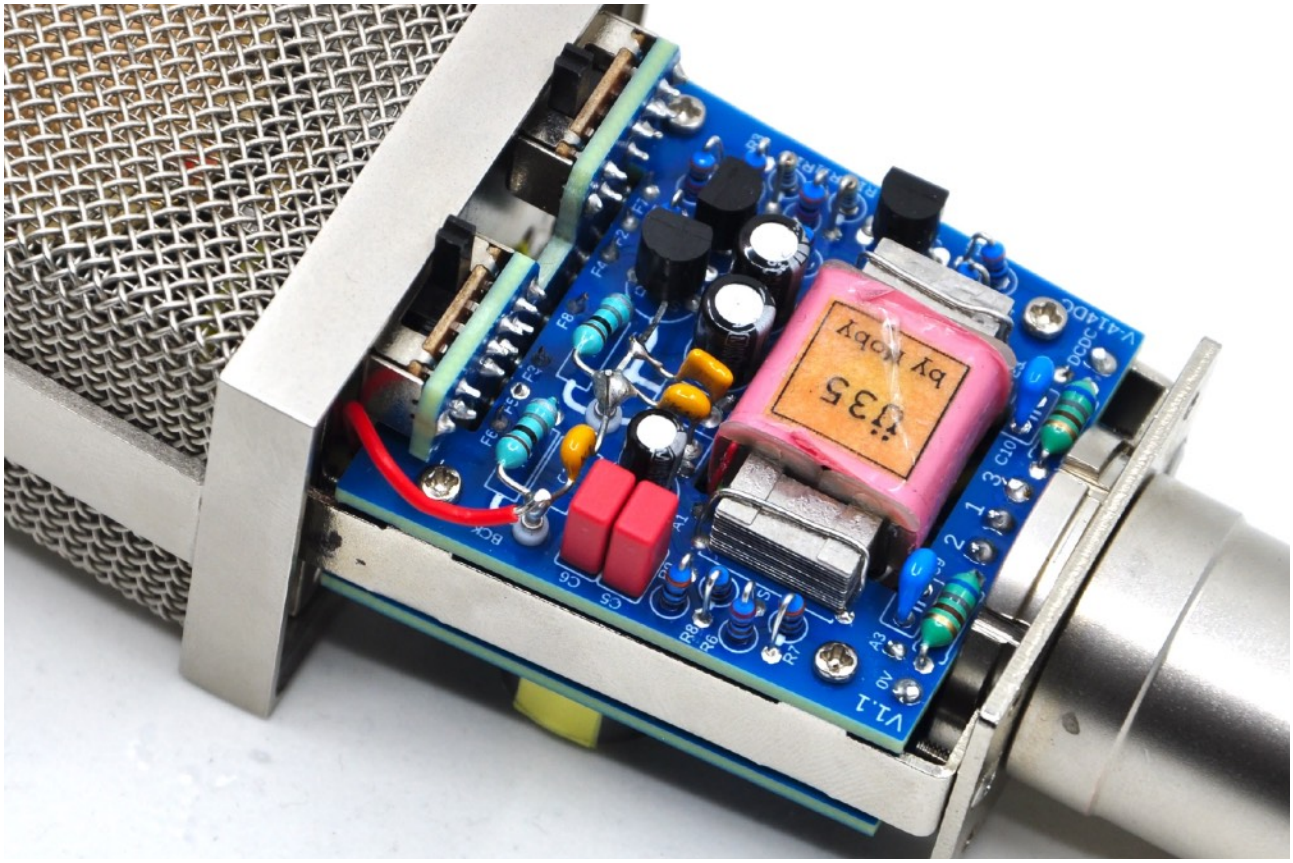


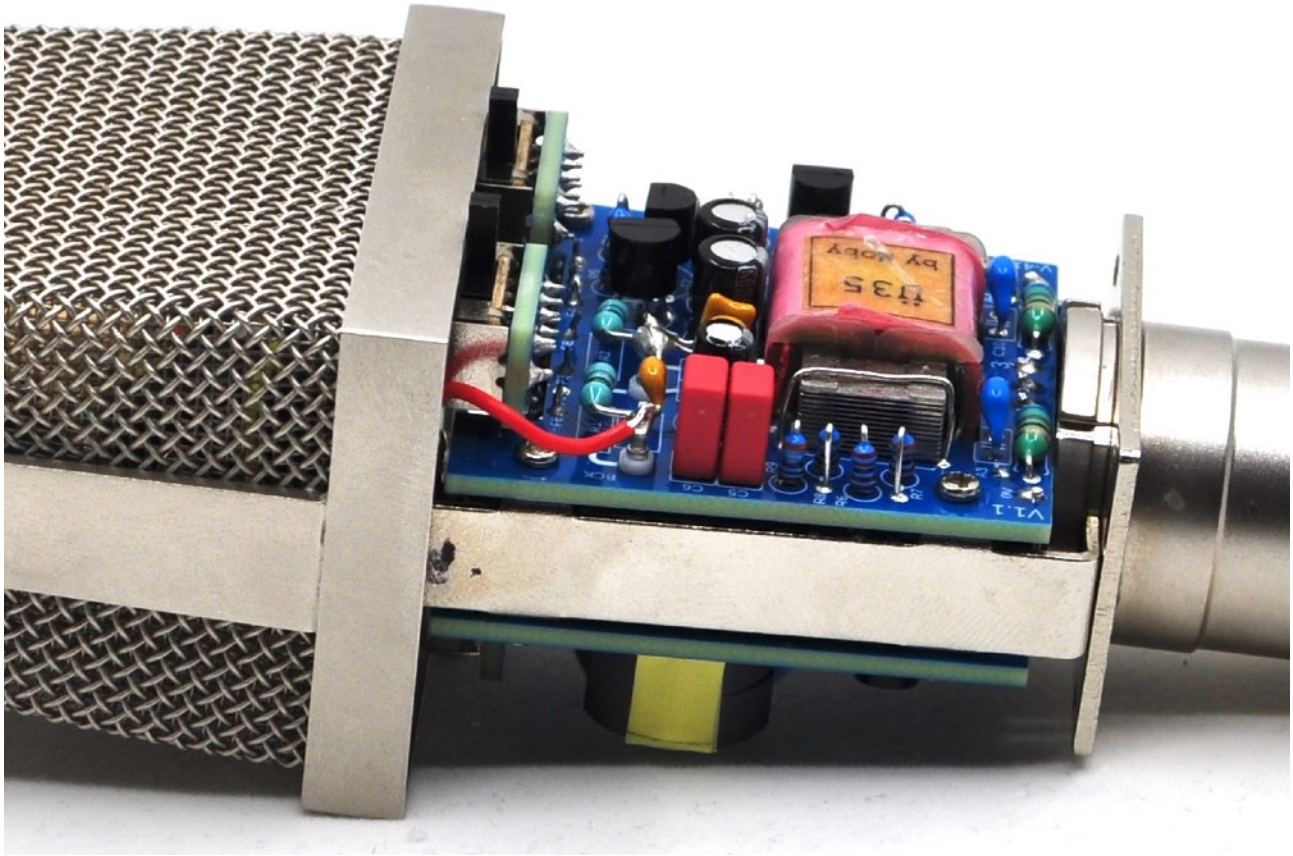
Pull the DC-DC converter board carefully against the chassis. Pull the resistor legs together to prevent a short circuit inside. Make sure there is no pinched cable anywhere before screwing the board firmly to the chassis using 4 M1.8 screws with a length of 6 mm.



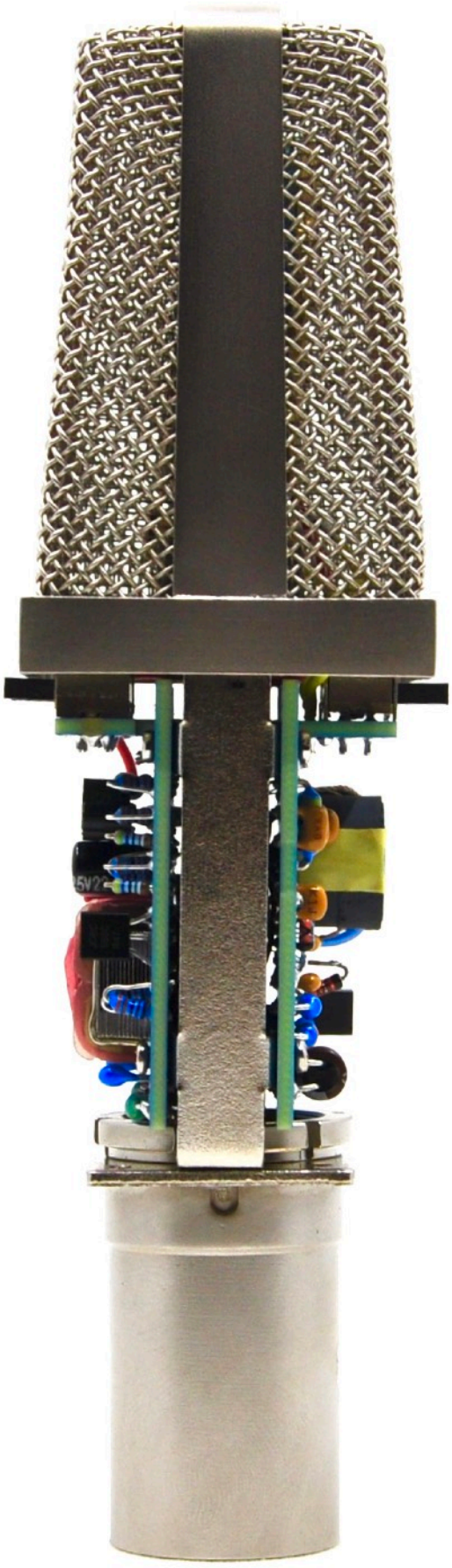


Now all that is left is to connect the cable leading from the backplate of the capsule to the HiZ section, specifically to the teflon pin marked "BCK". Take a look at the red cable in the picture.





Well, congratulations, because right now your new microphone is practically complete!!!! Connect the microphone to the preamp, activate phantom power and check everything necessary.

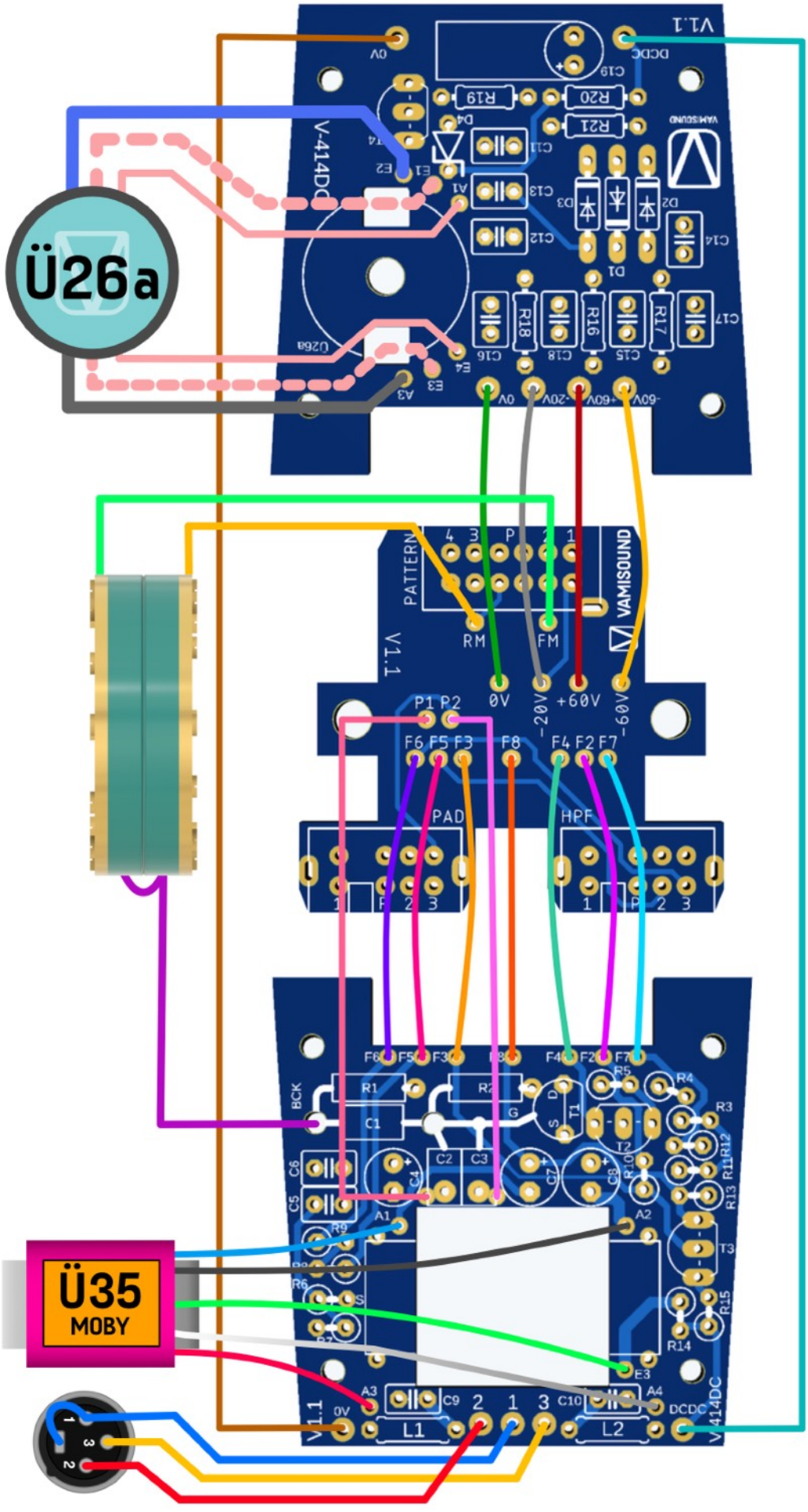



Ü26a
V-414DC
V1.1


Q Q 8 O


0 -10 -20
dB
0 75 150
Hz

WIRRING SCHEME



WIRRING INFO

1) Connect transformer board and DC-DC converter board via pad DCDC and 0V. DCDC=>DCDC, 0V=>0V. Use two 40 mm long wires for this.
2) Connect transformer board to switch board. Use two wires and interconnect pads P1 and P2 on the transformer board to pads P1 and P2 on the switch board.
3) Connect transformer board to switch board in this case via cutted resistors legs. Interconnect pads F2, F3, F4, F5, F6 and F7.
4) Connect DC-DC board and switch board via resistors legs. Interconnect pads 0V, -20V, +60V and -60V.
5) Join XLR1 pin via wire to pad 1 on transformer board. XLR2 pin to pad 2 and XLR3 pin to pad 3 on transformer board. Join XLR1 pin via resistor leg to XLR "ground lug" (on connector insert) = its mic body to XLR1 pin (0V) connection.
6) C12 capsule wiring: Front membrane to FM pad on the switch board, back membrane to RM on the switch board, backplate to teflon pin on transformer board marked as „BCK".
7) Ü26a transformer wiring: Blue cable is start of primary winding - connect it to A1 pad on DC-DC converter board. The twisted pair of litz wire on the same side as the blue wire is the center winding cable. Connect it to pad E1 on the DC-DC board. Last single litz wire connect to E2 pad. Black cable is start of secondary winding, connect it to A3 pad on DC-DC converter board. The twisted pair of litz wire on the same side as the black wire is the center winding cable. Connect it to E3 pad on the DC-DC board. Last single litz wire connect to E4 pad.
8) Moby´s Ü35 transformer wiring: Primary start cable (blue cable) to P+ (=A1 pad), primary end cable (black) to P- (=A2 pad), secondary start cable (red) to S+ (=A3 pad), secondary end cable (white) to S- (=A4 pad). Secondary center tap cable (green) to CT (=E3 pad) hole on the transformer board.
9) Its always great idea to check phase of DIY microphone against commercial microphone. If the microphone is out of phase just swap the two cables leading from pin 2 and pin 3 of the XLR insert.

ADDITIONAL INFO

1) Take your time when soldering the switches. You don't want to burn the plastic of the switch lever. Take a break while soldering the individual switch pins.

BILL OF MATERIAL

Part	Value	Tol.	Min.Volt.	Dimmensions	link 1	link 2	notes
Inductors							
L1	680uH				mouser link		
L2	680uH				mouser link		
Resistors							
R1	1G	10 %		6.5x2.5mm	mouser link		
R2	1G	10 %		6.5x2.5mm	mouser link		

Part	Value	Tol.	Min.Volt.	Dimmensions	link 1	link 2	notes
R3	33K	1 %		3.4x1.9mm	mouser link		* 12K is original value
R4	33K	1 %		3.4x1.9mm	mouser link		
R5	3K3	1 %		3.4x1.9mm	mouser link		
R6	2K2	1 %		3.4x1.9mm	mouser link		
R7	3K3	1 %		3.4x1.9mm	mouser link		*T2 bias setup
R8	8K2	1 %		3.4x1.9mm	mouser link		
R9	3K9	1 %		3.4x1.9mm	mouser link		
R10	18K	1 %		3.4x1.9mm	mouser link		
R11	39K	1 %		3.4x1.9mm	mouser link		
R12	47K	1 %		3.4x1.9mm	mouser link		
R13	4K7	1 %		3.6x1.6mm	mouser link		*T3 bias setup
R14	8K2	1 %		3.4x1.9mm	mouser link		
R15	330R	1 %		3.4x1.9mm	mouser link		
R16	4M7	1 %		6.5x2.5mm	mouser link		
R17	4M7	1 %		6.5x2.5mm	mouser link		
R18	4M7	1 %		6.5x2.5mm	mouser link		
R19	100R	1 %		6.5x2.5mm	mouser link		
R20	330R	1 %		6.3x2.3mm	mouser link		
R21	150K	1 %		6.3x2.3mm	mouser link		

Part	Value	Tol.	Min.Volt.	Dimmensions	link	type	notes
Capacitors							
C1	470pF		50V		mouser link	ceramic	
C2	330pF		50V		mouser link	ceramic	
C3	1nF		50V		mouser link	ceramic	
C4	3.3uF		50V	4x7mm	mouser link	electrolytic	
C5	100nF		50V	4x7mm	mouser link	film	
C6	100nF		50V	4x7mm	mouser link	film	
C7	33uF		10V	5x7mm	mouser link	electrolytic	
C8	22uF		25V	5x7mm	mouser link	electrolytic	
C9	2.2nF		50V		mouser link	ceramic	

Part	Value	Tol.	Min.Volt.	Dimmensions	link	type	notes
C10	2.2nF		50V		mouser link	ceramic	
C11	470pF		50V		mouser link	ceramic	
C12	15pF		50V		mouser link	ceramic	
C13	470pF		50V		mouser link	ceramic	
C14	470pF		50V		mouser link	ceramic	
C15	470pF		50V		mouser link	ceramic	
C16	240pF		50V		mouser link	ceramic	
C17	5.1pF		100V		mouser link	ceramic	
C18	5.1pF		100V		mouser link	ceramic	
C19	22uF		16V		mouser link	electrolytic	*5x11 mm will fit too
Switches							
2p4t				included to PCB set			Patterns
2p3t				included to PCB set			PAD and HPF
Transformer							
Ü35				www.mobytransformers.com			
Ü26A				included to PCB set			

Part	Value			link 1	link 2
Tranzistors					
T1	2SK30A-O			www.ebay.com	
T2	BC550C			mouser link	
T3	BC550C			mouser link	
T4	BC550C			mouser link	
Capsule					
C12	Tim Campbell CT12, 3U Audio C12				
	* Isolated backplates are not required for this build = 3 wire capsule set up only is sufficient.				
	* If you use a C12 capsule with separate backplates for this build, interconnect those two backplates by a piece of cable or resistor leg so they forms one single backplate.				
Capsule mount	You'll need an adequate stand (holder) for the C12 capsule. This is not included in the kit.				

Part	Value			link 1		link 2	
Others							
Teflon pin	2 pcs included in kit			mouser link			
Cables							
Screws	2x M3, 1x M2, 8x M1.8						
Nuts	2x M3						