



CP5176 Assembly guide



Safety warning

The kits are main powered and use potentially lethal voltages. Under no circumstance should someone undertake the realisation of a kit unless he has full knowledge about safely handling main powered devices.

Please read the “DIY guide” before beginning.

Print or open the following documents :

- CP5176 Schematics
- CP5176 Components layout
- CP5176 Parts list
- CP5176 Setup guide

Follow this guide from item number 1 till the end, in this order. The assembly order is based on components height, from low to high profile, in order to ease the soldering process : The component you are soldering is always taller than the previously assembled ones and it is pressing nicely against the work area foam.

Soldering

All the PCB holes are metallized. It means the connection between the top and bottom pads is already done. The parts must be soldered only from below (unless differently stated).

Use only small diameter solder, 0.5 or 0.7 mm, 1 mm maximum. Use the minimum possible amount of solder. Bad joints are almost always caused by too much solder.

Cut the component leads and pins totally flush with the PCB after soldering. A too long tail could create an electric connection with the side plate.

Here are two excellent introduction to soldering videos:

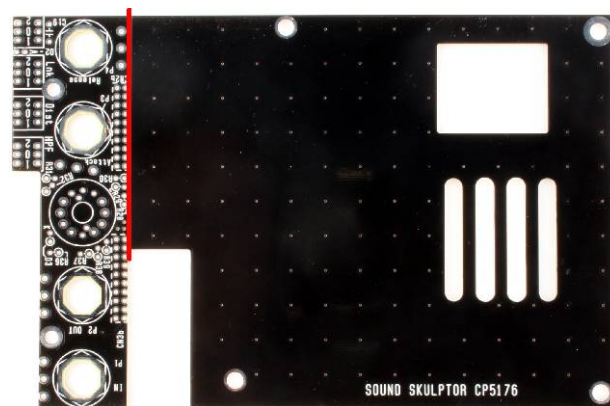
<http://www.eevblog.com/2011/06/19/eevblog-180-soldering-tutorial-part-1-tools/>

<http://www.eevblog.com/2011/07/02/eevblog-183-soldering-tutorial-part-2/>

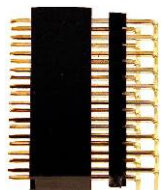
CP5176 Assembly guide – Main PCB

1. PCB split

Split the second PCB along the groove. Use extra thin sandpaper to clean up all the rough sides.

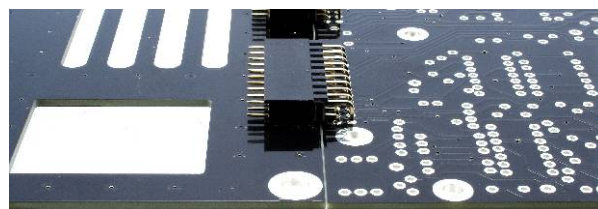


CP5176 Assembly guide – Main PCB



2. PCB to PCB connectors

Insert the female 2x10 connectors on the male parts and position them on the solder side of the main PCB. Use the second PCB to create a flat continuous surface. The female connectors must sit flat on the second PCB. Solder one or two pins from this side. Then turn the PCB over and solder the other pins from the components side.



Warning : The connectors are installed *on the solder side* of the PCB (the side without writings).



3. DOA Pin Sockets

Solder the 7 pin sockets for the DOA. Solder one at a time. Insert one socket, turn over the PCB and press against a solid but flexible surface like cork or dense foam then solder. The correct positioning of the sockets is very important for easy insertion of the DOA.



4. Diodes

Add D1, D4 to D8. Use a lead forming tool to bend the leads at 0.4”.

Warning : Make sure to respect the direction of the diodes which is marked by a ring on the component and a double line on the PCB marking.



5. Resistors – (1)

The best method to select and install the resistors is the following:

1. pick a row of resistors in the resistors bag,
 2. Measure one of the resistors with your DMM,
 3. Look up the parts-list PDF for the closest value,
 4. Check the colour code and quantity for confirmation,
 5. Use the search function on the Layout PDF page with the resistor value or reference: the corresponding resistors are highlighted,
 6. Insert and solder.
- (You can use the same method later, for the capacitors)



6. Resistors - (2)

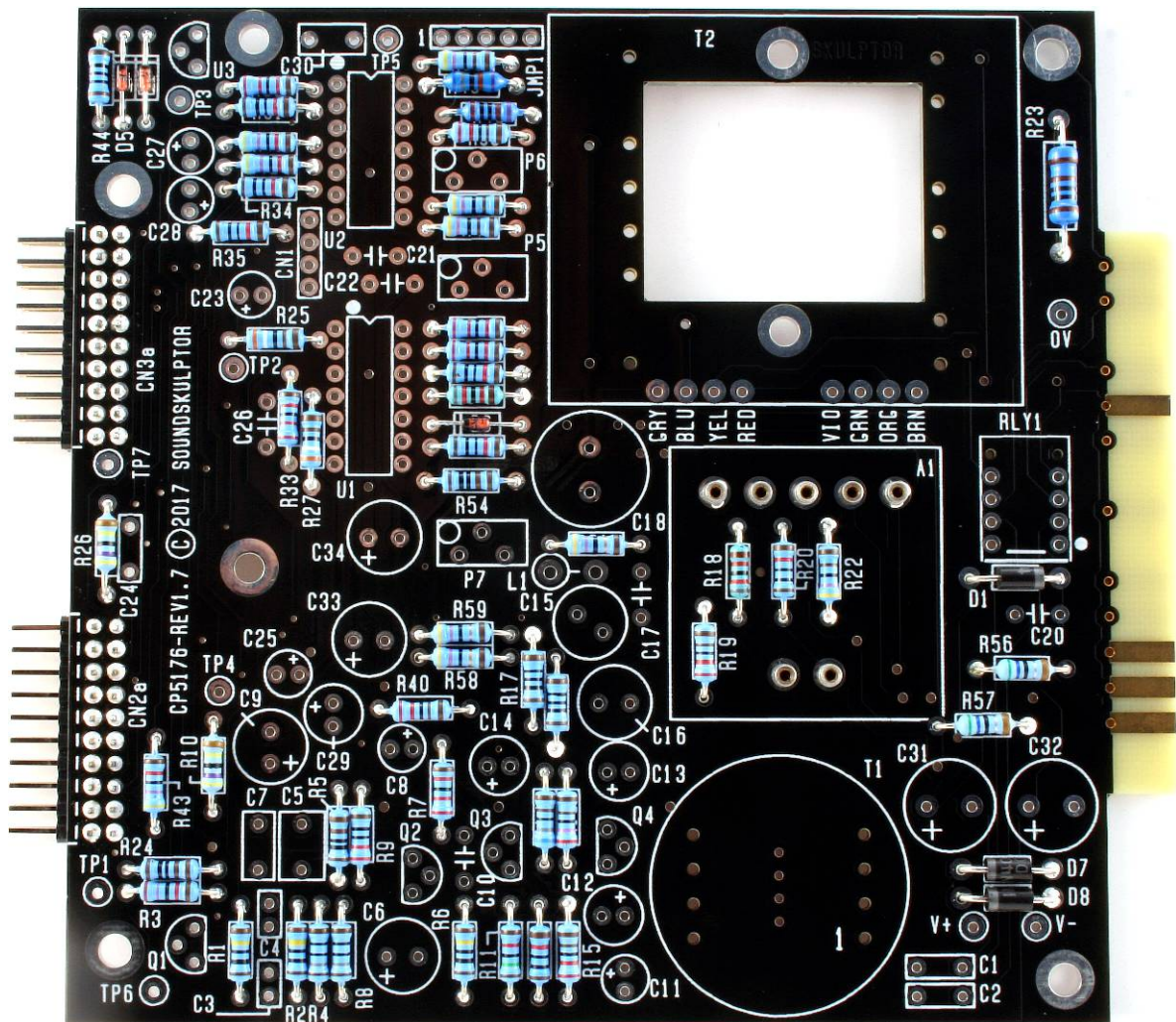
Add R1 to R27, R33 to R35, R40 to R62.

Control the resistor values with a digital multimeter. Bend the leads at 0.4” with a lead forming tool., except for R23 which is bent at à 0.6”.

Warning : It is very important to check the resistors value with a DMM because the colour code can be ambiguous. For example 1K (brown-black-black-brown-brown) can be confused with 110R (brown-brown-black-black-brown).

Warning : Resistors R45 (GK8) and R46 (1K) are 0.1% precision resistors. They must not be confused with 1%, same value resistors. Their last colour ring is violet instead of brown.

CP5176 Assembly guide – Main PCB



7. Ceramic capacitors



Add C10, C26, C17, C20, C21, C22.

8. IC Sockets



Insert and solder the 14 pins sockets of U1 and U2.

Warning : Make sure to respect the socket direction, marked by a notch.

9. Relay



Add RLY1. Two pins are left without solder.

Warning : Make sure to respect the direction of the relays which is marked by a white line on the component and on the PCB marking.

10. Test pins



Solder the 10 test pins TP1 to TP7, V+, V- and OV.

CP5176 Assembly guide – Main PCB



11. Jumper headers

Insert the 5 pins jumper header JMP1. Solder one pin first, check verticality, then solder the other pins.



12. Transistors and regulators

Add Q1 to Q4 and U3.

Warning : Watch out the transistor direction.



13. Film capacitors

Add C1 to C4, C24, C7, C30, C5.



14. Connector

Add CN1. Solder one pin, check verticality then solder the other pins.



15. Trimmer potentiometer

Add P5, P6, P7. These 3 trimmers are different from each other. Solder one pin, check verticality then solder the other pins.



16. Non polarized small electrolytic capacitors

Add C15, C16.

These caps are not polarized and can be inserted in any direction.



17. Polarized small electrolytic capacitors

Add C8, C11, C23, C25, C27, C28.

Add C12, C13, C14, C29.

Add C6, C9, C31, C32, C33, C34.

Warning : The +lead must go into the +hole. Do not reverse!

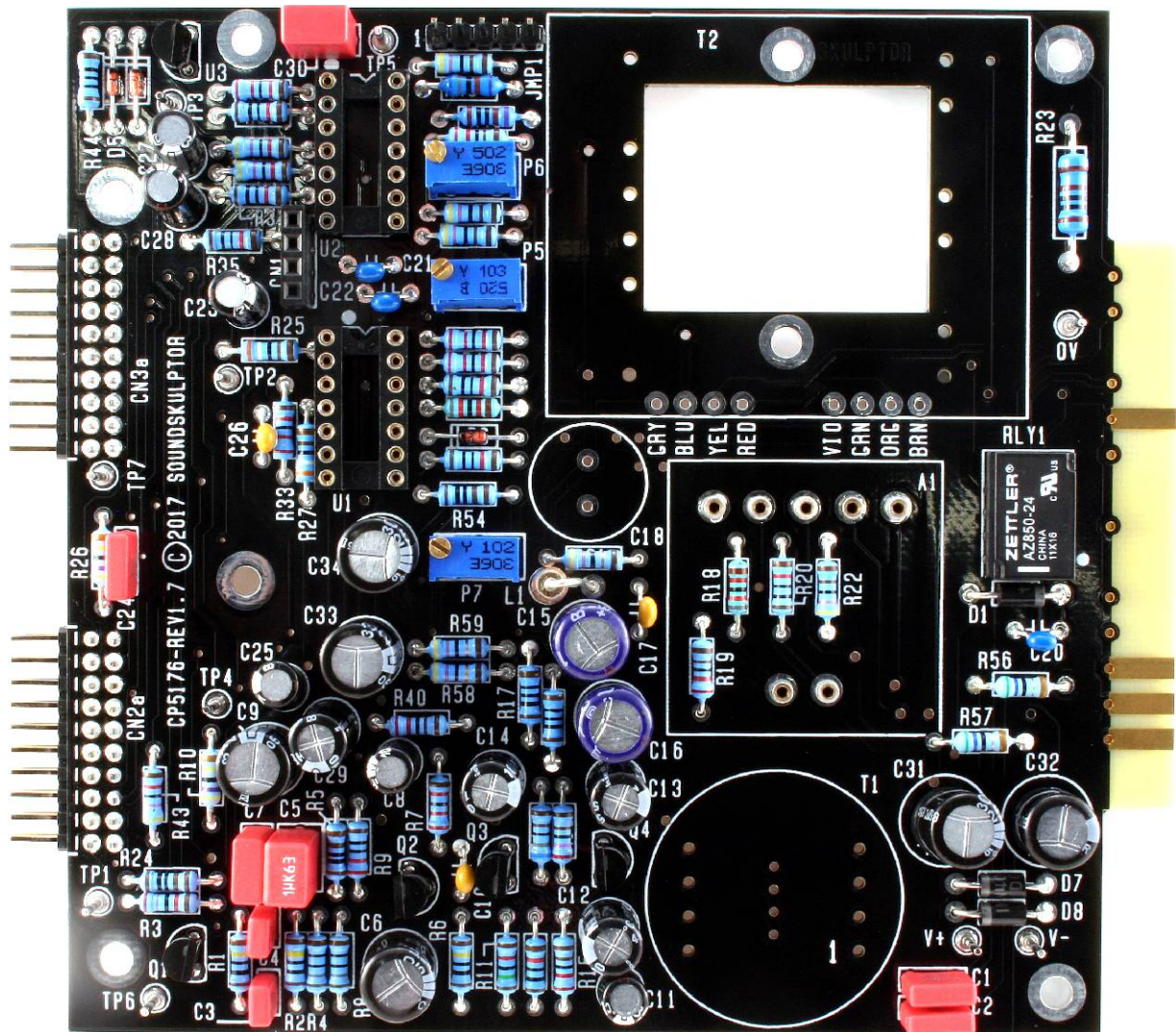


18. Inductor

Add L1. This inductor is installed vertically.



CP5176 Assembly guide – Main PCB



19. Input transformer

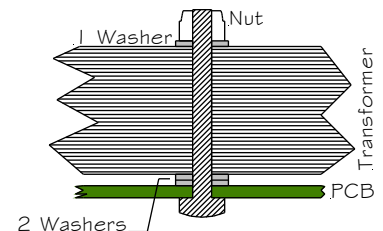
Pin 1 on the transformer is identified by a red dot. Insert the transformer, pin 1 into hole number 1 and solder.

Warning : Double check the pin 1 position because this transformer can be mounted backwards!



20. Output transformer

The transformer is mounted using two 25mm M3 screws inserted from the back of the board. Two metal washers are fitted on each screw to prevent the transformer touching the PCB. One more washer is used before the nut to protect the lams. Shorten the leads to the necessary length, around 6 cm. Strip on 5mm and tin. Insert in the pad hole and bend the tinned tip flat on the pad before soldering. Cut flush.



21. Non polarized large electrolytic

Add C18. Solder one lead first, adjust verticality then solder the second lead. This cap is not polarized and can be inserted in any direction.

CP5176 Assembly guide – Main PCB



22. IC's

Insert U1 and U2 into their sockets. It is necessary to bend the pins slightly inward before inserting.

Warning: Make sure to insert the IC's in the correct direction which is identified by a notch.



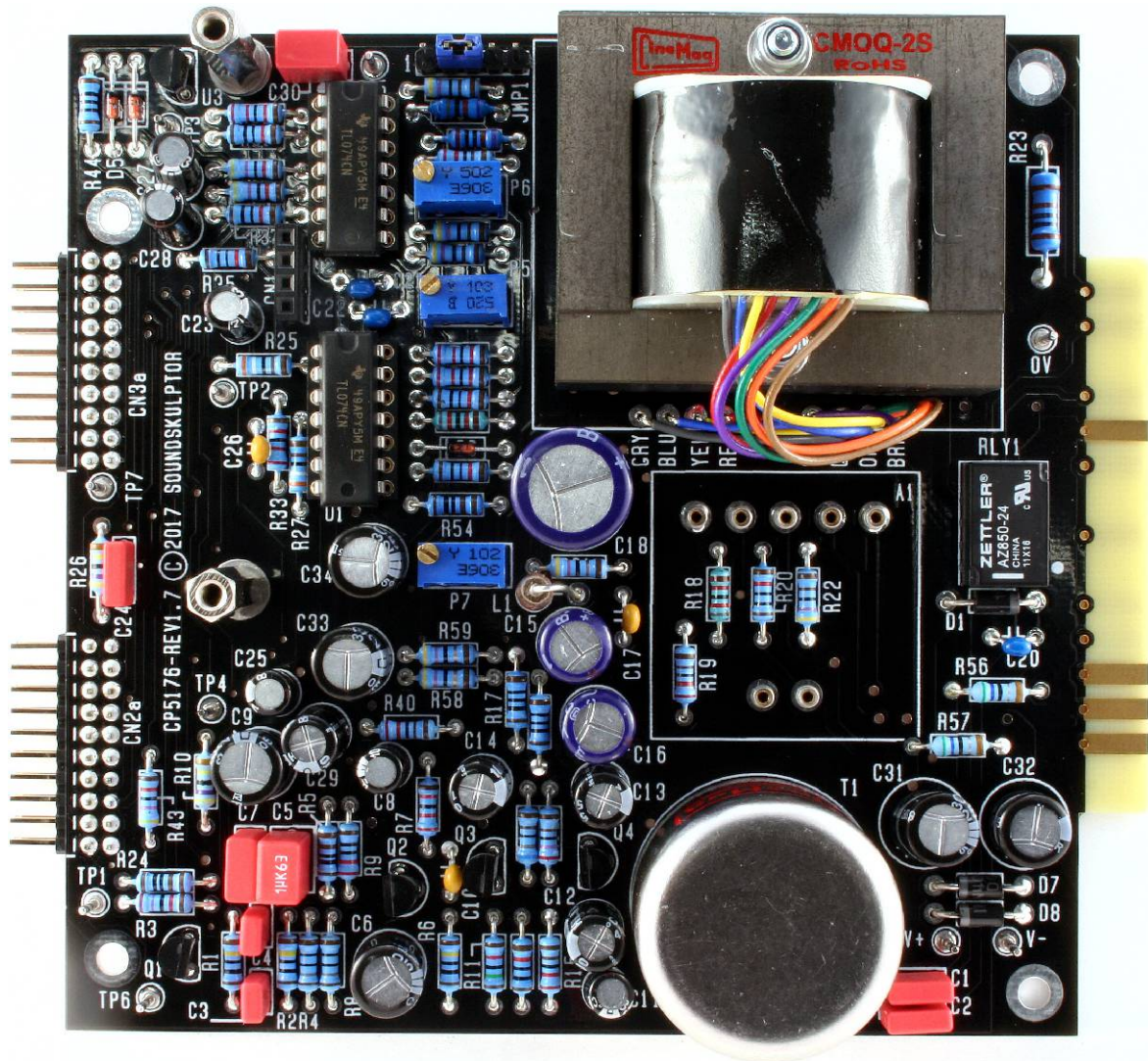
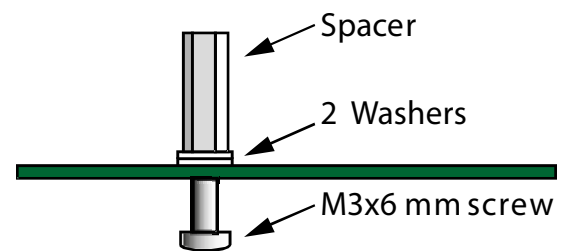
23. Jumpers

Insert one jumper on JMP1 (between pins 2 & 3).



24. Gain reduction meter spacers

Insert a M3x6 mm screw from below PCB, add two metal washers and the 20mm spacer.
Repeat for the second spacer.



CP5176 Assembly guide – Main PCB

25. Visual check

Brush the solder side with a hard tooth brush to remove any remaining solder bits.

Make a full visual check. Any missing component on the board ? Any remaining component in the box ?

When everything looks correct, proceed with the front PCB assembly.

CP5176 Assembly guide – front PCB assembly



26. Diode

Add D3. This diode is installed vertically.

Warning : Make sure to respect the direction of the diode which is marked by a ring on the component and letter K on the PCB marking.



1. Resistors

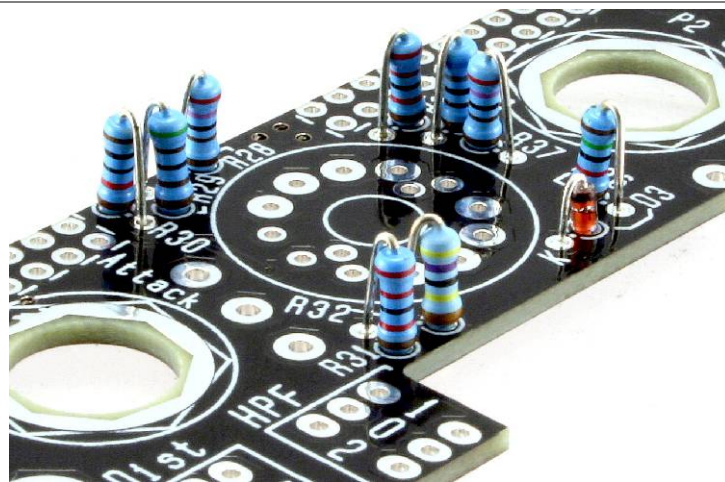
Add R28 to R32, R36 to 39.

Control the resistor values with a digital multimeter. The resistors are installed vertically.

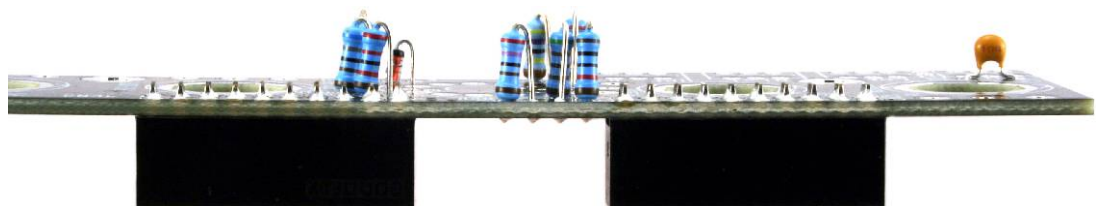


2. Ceramic capacitor

Add C19.



3. Connectors 2x10



Solder the two 2x10 connectors on the back of the PCB, inserted from the solder side.



4. Spacers

Attach two 15 mm spacers with two M3x6 mm screws, inserted from the solder side.

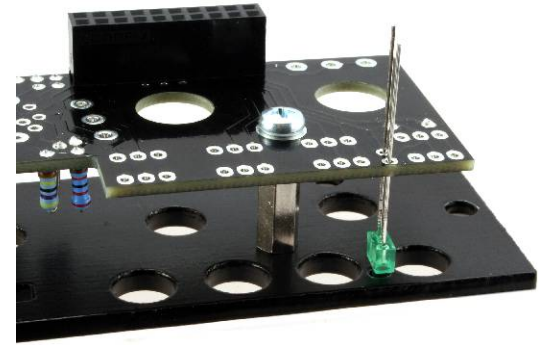
CP5176 Assembly guide – front PCB assembly



5. 2mm LED

Insert the 2mm LED, taking care of the anode/cathode position. The shortest leg (cathode) is the closest to the PCB edge. Temporarily attach the front panel with two M3x8 mm screws. Adjust the LED flush with the front panel surface. Solder.

Remove the front panel and spacers.

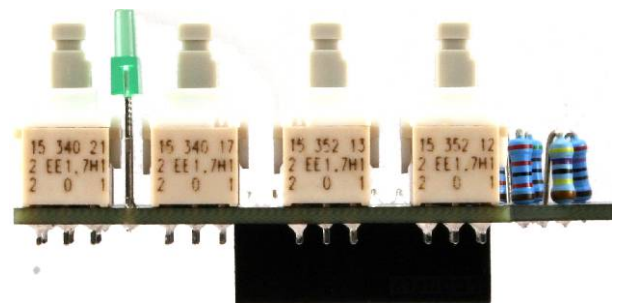


6. Push switches

Insert the push switches, flat on the PCB, in the correct direction and solder one pin. Check again the good position then solder the other pins.

Warning : The switch direction is given by the digits 2 0 1, engraved on one side of the switch. Match the digits with the ones on the PCB.

Insert the switch caps.



7. Potentiometers

Add P1, P2, P3 and P4. Insert the potentiometers into the PCB holes from the solder side, making sure the pins fit into the corresponding PCB pads. Attach with washer and nut on the component side, tighten firmly to ensure a perfect perpendicular position and solder.

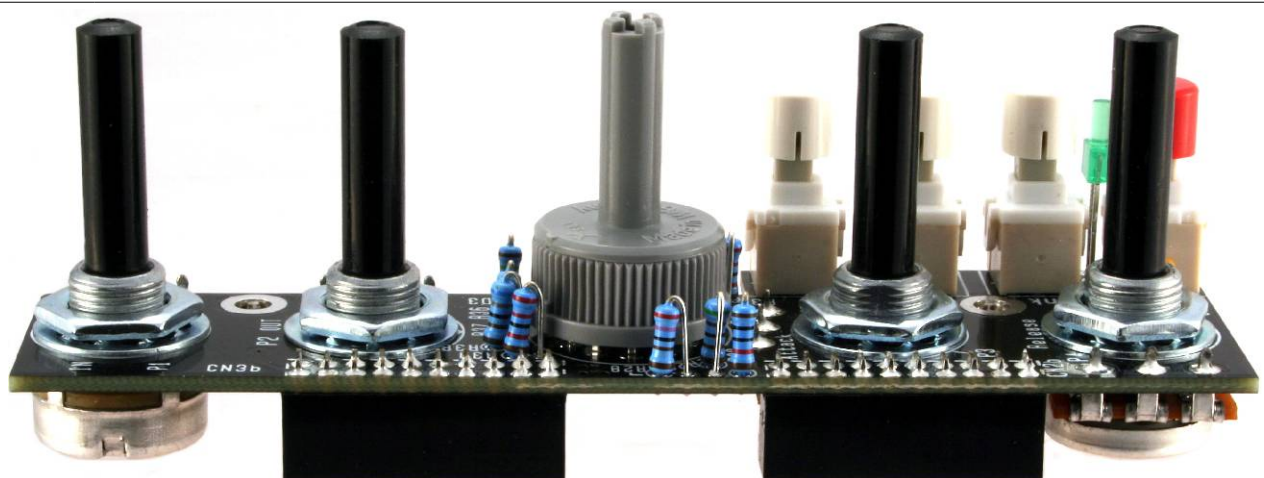
Warning : The 4 potentiometers have different values.



8. Rotary switch

Add the 6 positions rotary switch RSW1.

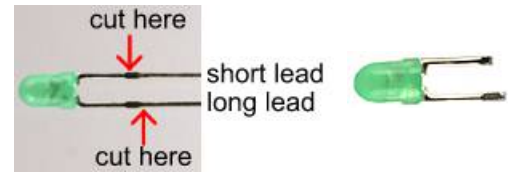
Warning : The position of the switch is critical for a good front-plate matching. The switch rests on 3 small feet that must sit perfectly flat on the PCB. Press the switch on the PCB and solder two opposed pins. Check position then solder the other pins.



CP5176 Assembly guide – Gain reduction meter

1. LEDs

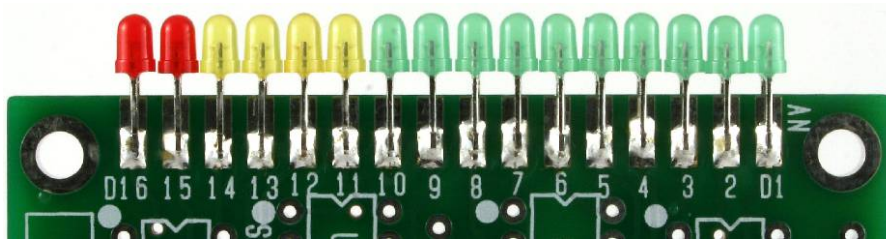
For each one of the 16 LED's cut the short leg (cathode) at 5mm from body and cut the long leg (anode) at 6mm.



Then insert the first green LED on the PCB, long leg (anode) on top. Make sure that the leg is perfectly parallel to the pad. Solder the anode but leave the cathode free for now. The position is still easy to adjust until both legs are soldered.

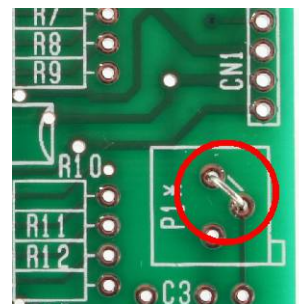
Insert and solder the next LED and repeat until the 16 LEDs are in position.

Make a last visual check and correct LED's that are not perfectly lined up, then solder the cathodes on the PCB back side.



2. Strap

Solder the strap indicated in red on the layout schematic. Use a resistor lead that was cut previously.



3. Resistors



Add R1 to R20.

Control the resistor values with a digital multimeter. Bend the leads at 0.4" with a lead forming tool.

4. Integrated Circuits



Insert U1, U2, U3 and U4 and solder. You will need to bend the pins slightly inwards before inserting.
Warning : Make sure to respect the IC direction, marked by a semi-circular notch on the IC and a dot on the PCB.

5. Regulator IC's



Add U5 and U6. The IC's are installed flat on the PCB in order to minimize the components height.

Warning : Watch out the IC direction.

6. Ceramic capacitor



Add C3. This capacitor is also installed flat on the PCB.

CP5176 Assembly guide – Gain reduction meter



7. Electrolytic capacitors

Add C1, C2. These capacitors are installed below, **on the solder side** of the PCB.

Warning : C1 & C2 are soldered under the PCB, on the solder side.

Warning : The +lead must go into the +hole. Do not reverse.

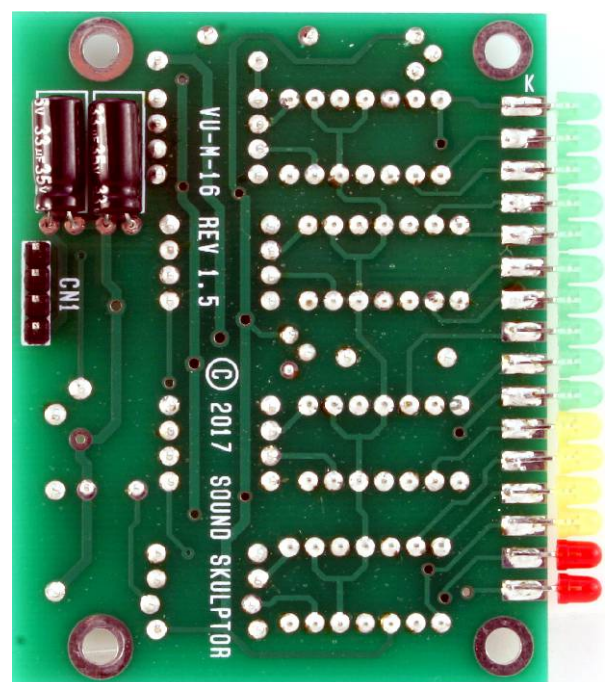
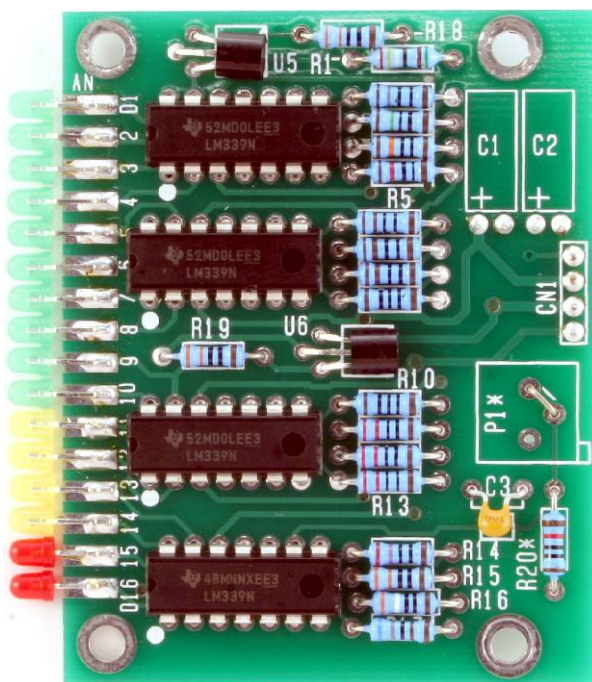


8. 4 pins connector CN1

Install the 4 pins header on the solder side of the PCB. Solder one pin, check verticality then solder the other pins.

Warning : CN1 is soldered under the PCB, on the solder side.

Warning : the connector pins must be exactly perpendicular to the PCB to allow proper insertion into the main board.

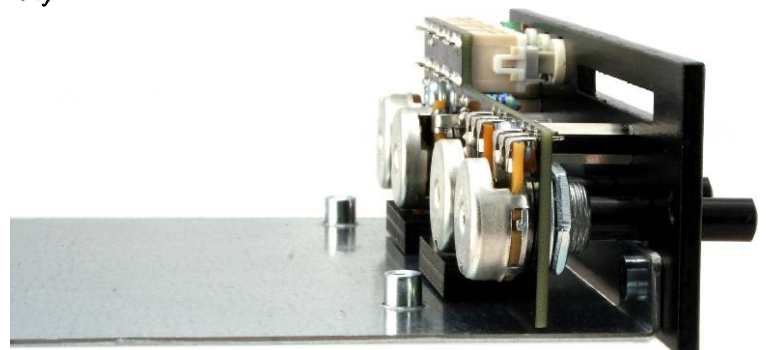


CP5176 Assembly guide – Final assembly

9. Front panel and Side plate assembly

Attach the potentiometers PCB to the front panel with two M3x6 black screws, two 15mm spacers and two M3x6 screws. Check that the push buttons move freely in the panel holes.

Attach the side plate to the front panel with two M3x6 black screws.

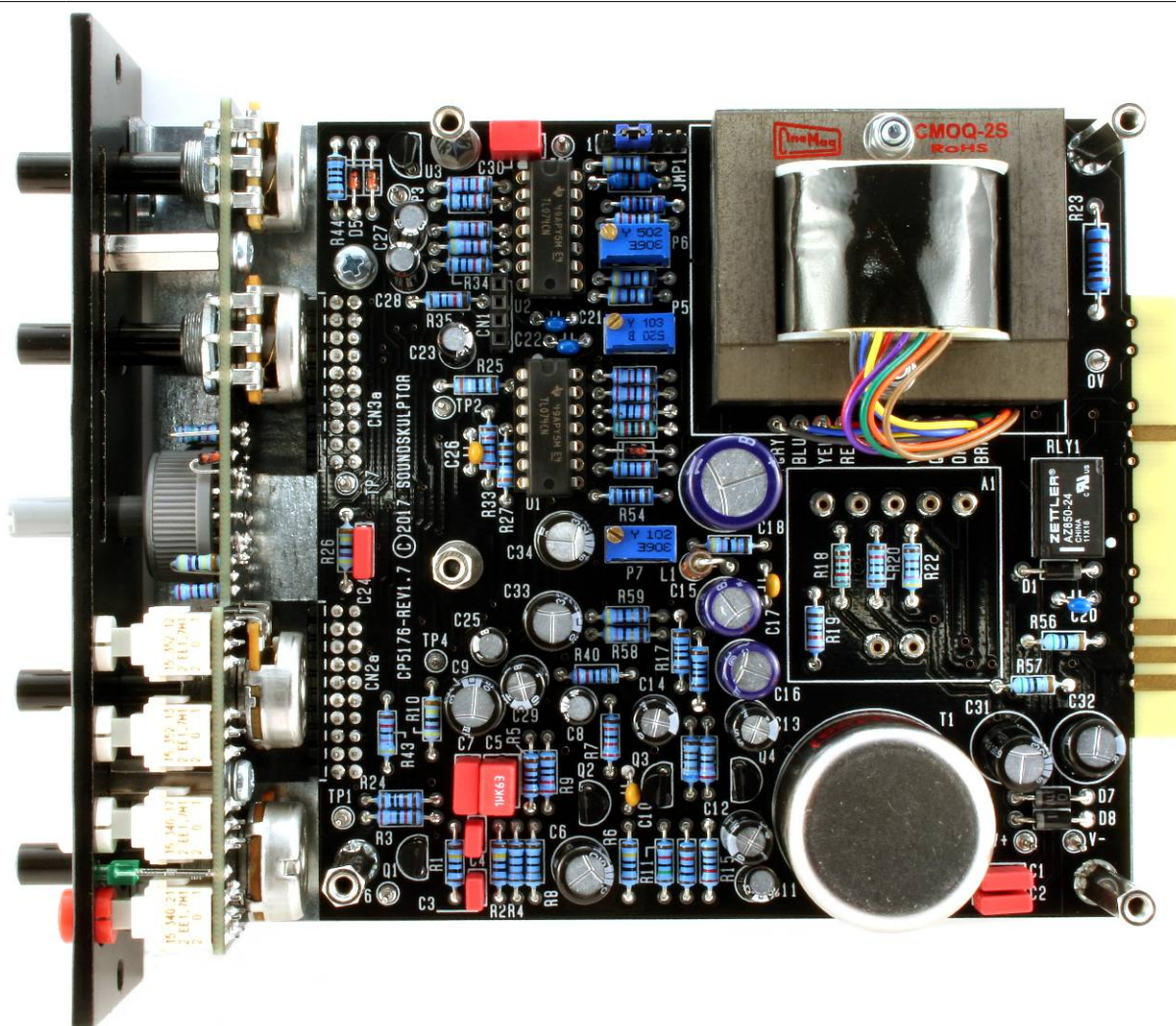


CP5176 Assembly guide – Final assembly

10. Main PCB assembly

Insert the main PCB connectors into the connectors of the potentiometers PCB until the main PCB holes match the side plate standoffs.

Attach the main PCB with three M3x6 M3x25mm spacers and one M3x6mm screw in the upper left corner and four lock washers inserted at the base of the spacers.



11. Knobs

Attach the 5 knobs to the 5 potentiometers and switch spindles.

12. Test and setup

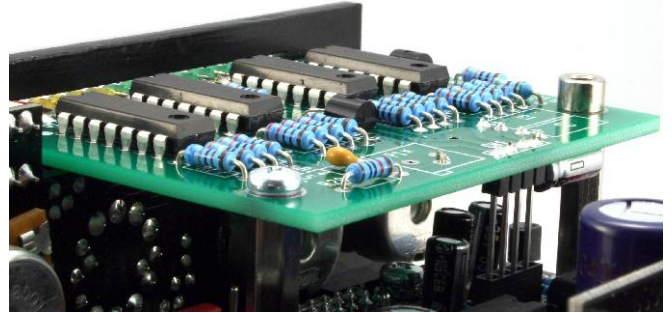
It is time for test and setup. Follow instructions on [cp5176-setup-guide.pdf](#).

CP5176 Assembly guide – Final assembly

13. Gain reduction meter assembly

Attach the GR meter on the lower spacer with one M3x6 screw.

Place the 4mm spacer on the higher hole



14. Cover assembly

Place the cover on top of the compressor. Attach with 3 M3x6mm countersunk screws plus one M3x12mm in the hole corresponding to the 4mm spacer.



15. Congratulations !

You're done !