

MP4500 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:

- MP4500 Schematics
- MP4500 Components layout
- MP4500 Parts list

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/>

In case of error: component soldered in the wrong place

Do not try to save the component! This will very likely damage the PCB which cost 100 times more than most components.

Except for transformers which are also expensive, cut the components pins with cutting pliers in order to be able to remove the pins one by one.

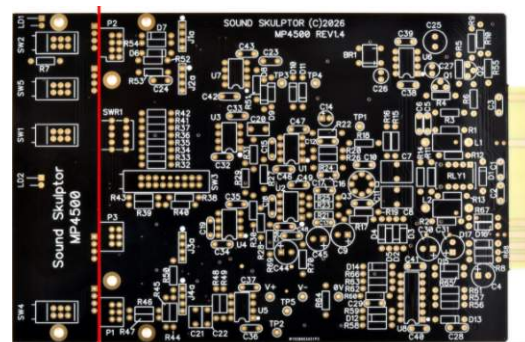
Then empty the holes with a de-soldering pump (this one works great : Jonard Industries DP-100).

MP4500 Assembly guide – Main PCB

1. PCB split

Separate the PCB into two parts by snapping it along the groove. It will break easily with light pressure.

Use extra-fine sandpaper to smooth any rough edges.



2. Resistors



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 color code and quantity for confirmation,
5. Use the search function on the Layout PDF page with the resistor value: All the corresponding resistors are highlighted,
6. Insert and solder.

(You can use the same method later, for the capacitors)

Add all the resistors of the main PCB (black identifier in the parts list).

Control the resistors value with a digital multimeter. Bend the leads at 0.4" with a lead forming tool.

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

Warning : It is a good idea to protect the back connector golden fingers with some adhesive tape because if your iron slips and touches one, it will be immediately and irremediably polluted with tin.

3. Diodes



Add the zener diodes D6, D7, D8, D10. Make sure you don't confuse them with the other diodes.

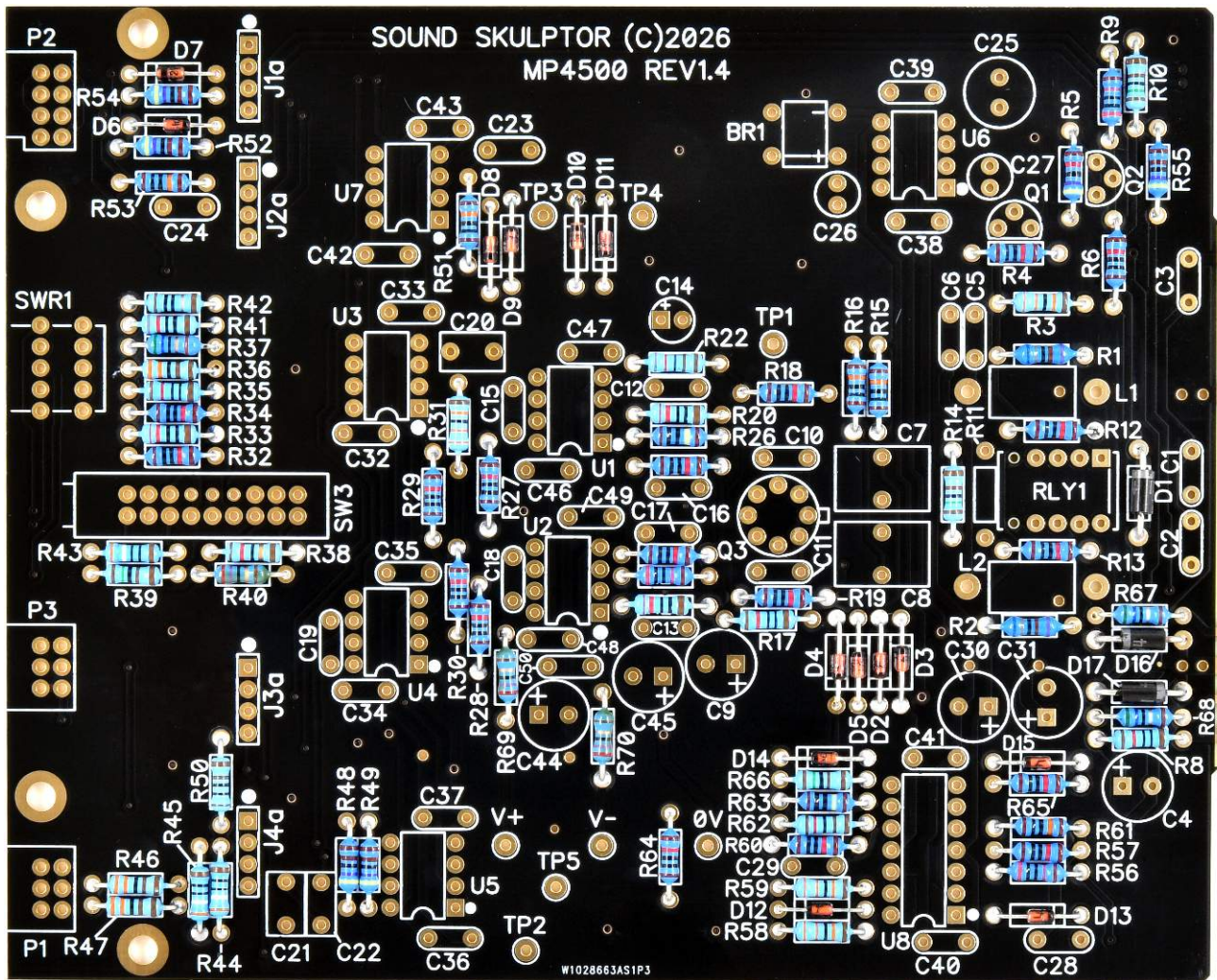
Add D2, D3, D4, D5, D9, D11, D12, D13, D14, D15.

Add D1, D16, D17.

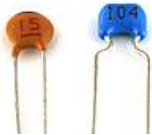
Warning : Make sure to respect the direction of the diodes which is marked by a ring on the component and a double line on the PCB marking.



MP4500 Assembly guide – Main PCB



4. Ceramic capacitors



Add C10, C11, C15, C18, C19.

Add C3.

Add C5, C6, C12, C13, C16, C17.

Add C1, C2.

Add C29, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C46, C47, C48, C49, C50.

Add C23, C24, C28.

5. Bridge rectifier



Insert and solder the bridge rectifiers BR1.

Warning: The direction of the bridge is identified by a beveled side and 2 signs + and – on the case and on the PCB.

6. IC Sockets



Insert and solder the seven 8 pins sockets.

Insert and solder the 14 pins socket.

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



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7. Relay

Add RLY1.

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.



8. Small film capacitors

Add the small film capacitors C20, C21, C22.



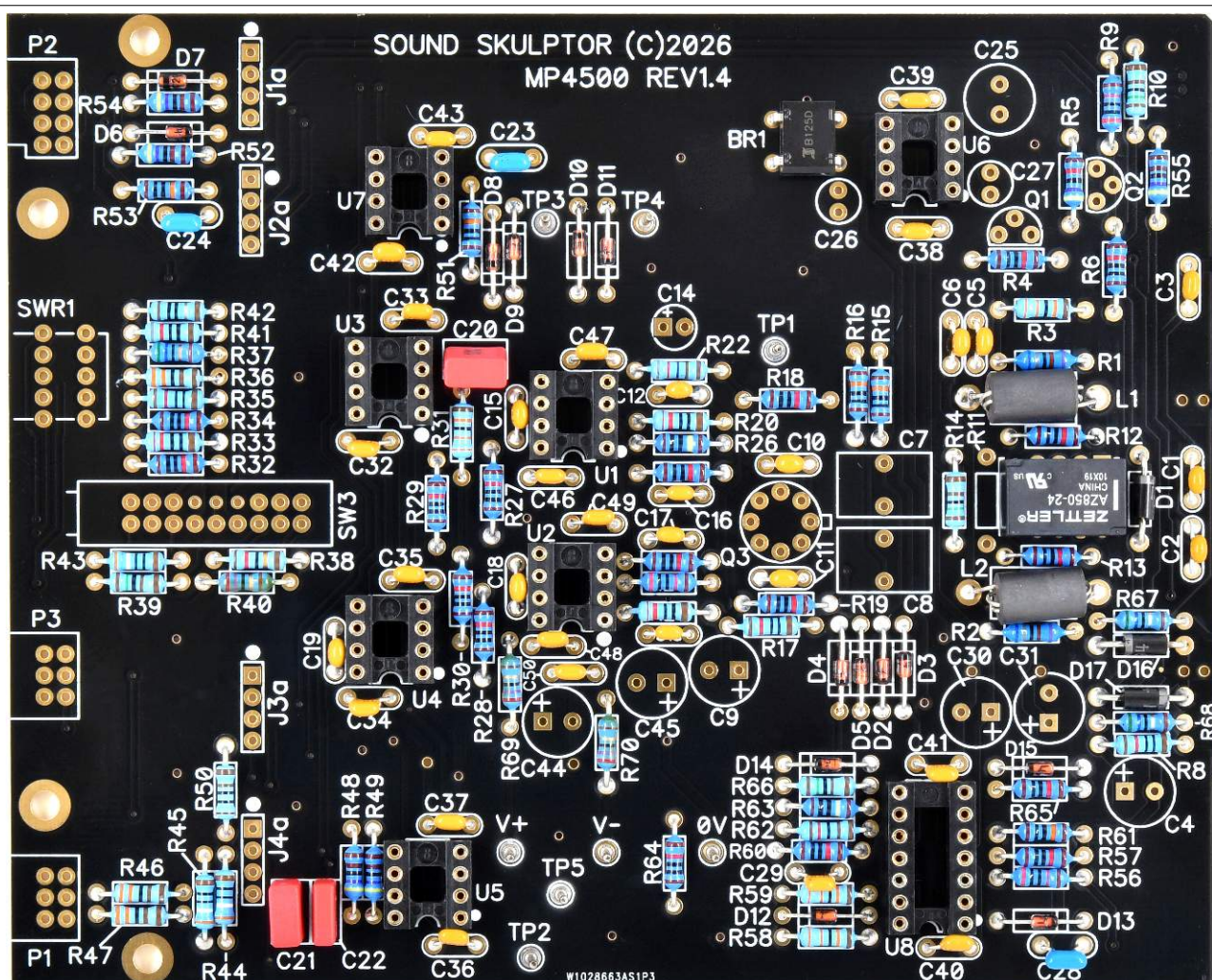
9. Ferrite beads

Add the two ferrite beads in L1 and L2.



10. Test pins

Solder the 8 test pins TP1, TP2, TP3, TP4, TP5, V+, V-, OV.



MP4500 Assembly guide – Main PCB



11. Transistors

Add Q1 and Q2.



12. Matched transistor pair

Insert the 8 pins of the component, positioning the tab as indicated on the PCB silkscreen.



13. Connectors J1a...J4a

Add the 4 female connectors. Solder one pin first, ensure the component is perpendicular to the board, then solder the other pins.



14. Push switch

Insert SW3 flat on the PCB and solder one pin. Check the good position then solder the other pins.



15. Rotary switch

Insert SWR1 and solder.

Warning: To ensure proper alignment with the front panel, mount the switch perfectly flush against the PCB.



16. Potentiometers

Add P1, P2, P3.

Same warning as for the rotary switch.



17. Large film capacitors

Add C7 and C8.



18. Bipolar electrolytic capacitors

Add C25, C26 and C27.



19. Electrolytic capacitors

Add C14, C9, C30, C31, C44, C45, C4.

Warning : The +lead must go into the +hole. Do not reverse (they may explode!)



20. Spacers

Attach two 16mm spacers with two M3x6mm screws.



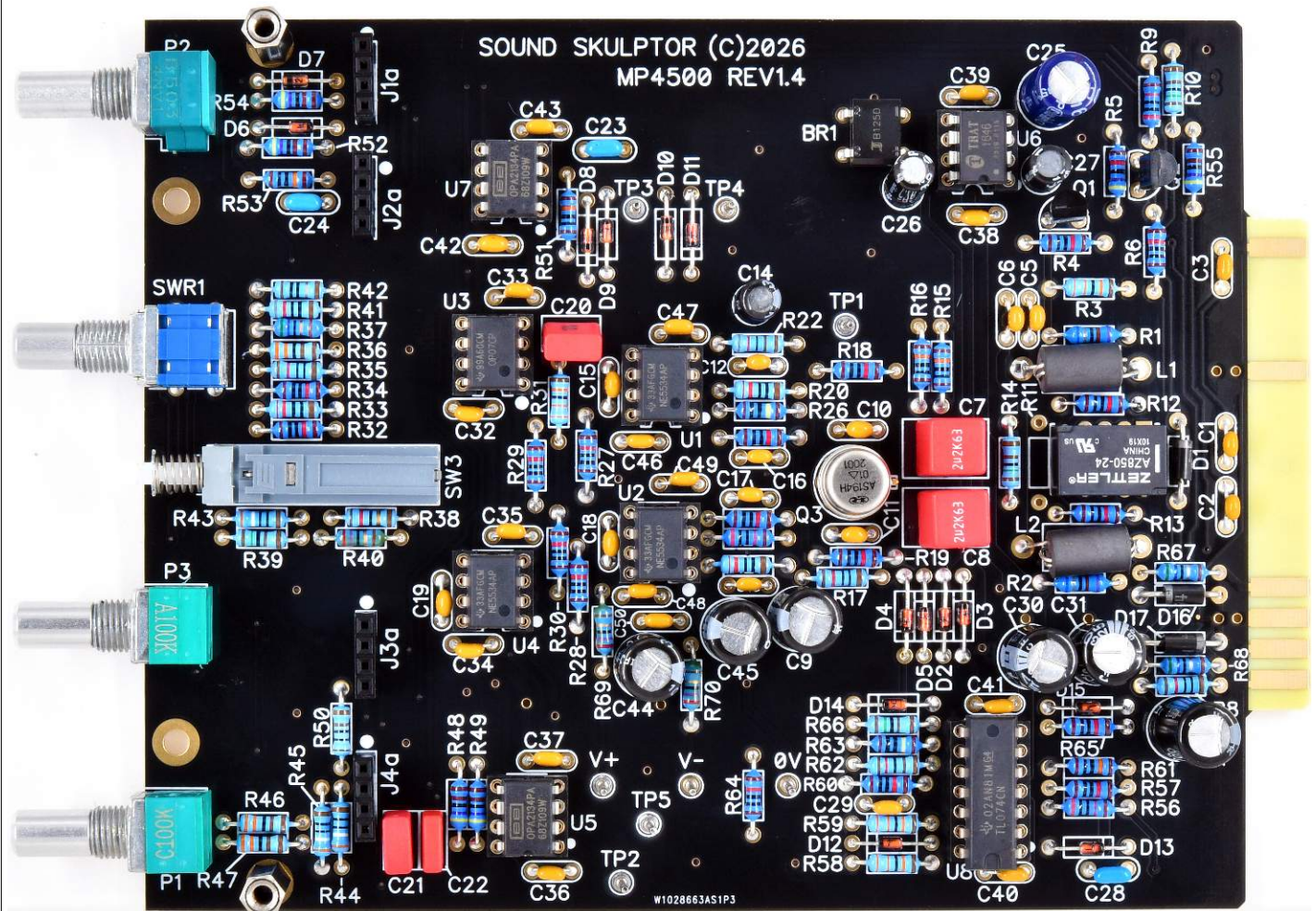
MP4500 Assembly guide – Main PCB



21. Integrated circuits

Insert the 8 integrated circuits U1 to U8 into their respective sockets.

Warning : The IC's have a direction identified by a notch or a dot.



22. Visual check

Check that all component leads are cut short. 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?

When everything looks correct, proceed with the other board assembly.

MP4500 Assembly guide – Switches PCB



23. Resistor

Add R7.

MP4500 Assembly guide – Switches PCB



24. Push switch

Add SW1, SW2, SW4, SW5.



25. Headers J1b, J2b, J3b, J4b

Add the headers on the **back side** of the PCB.

Solder one pin first, ensure the component is perpendicular to the board, then solder the other pins.

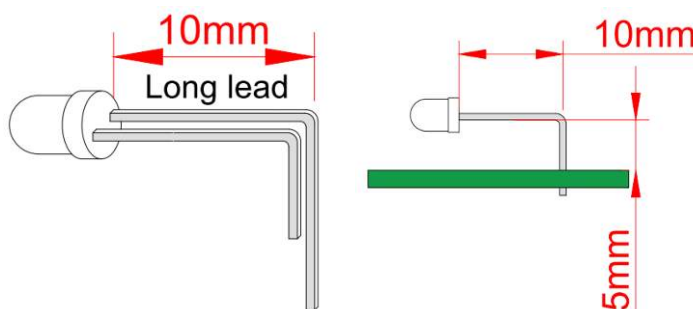


26. LEDs

Bend down the leads of LD1 and LD2 at 10mm from the body, with the long lead at the back.

Insert the LED's in their respective position (LD1: red, LD2: clear) and solder the leads at 5mm from the PCB.

You can use the front panel to help you position the LEDs.



27. Push switch caps

Insert the caps on the push switches.



MP4500 Assembly guide – Final assembly



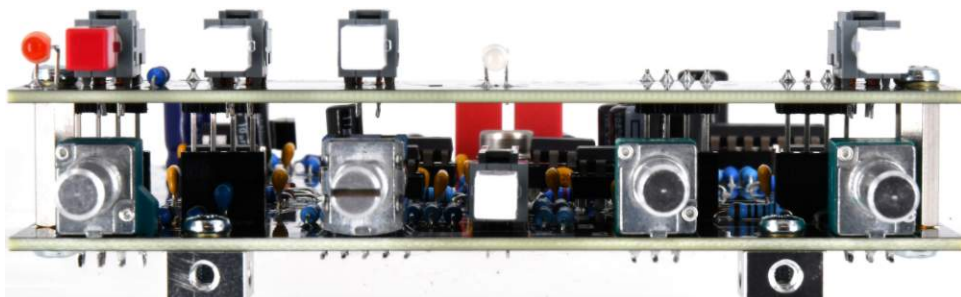
28. 3D nuts

Attach the two 3D nuts below the main PCB with 2 M3x6mm screws.



29. PCB assembly

Assemble the four connectors J1 to J4 together and attach the top PCB to the spacers with two M3x6 screws.



30. Front panel assembly

Insert the switches and pots into the front panel and attach it with two m3x6 countersunk black screws into the 3D nuts.

Attach the switch and pots with their nut. Tighten very gently, being careful not to scratch the panel.

31. Knobs

Attach the 4 knobs and insert the color caps.

32. Congratulations

You're done!

Photo à venir