



## DI503J 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:

- DI503J Schematics
- DI503J Components layout
- DI503J 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, 1mm 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:

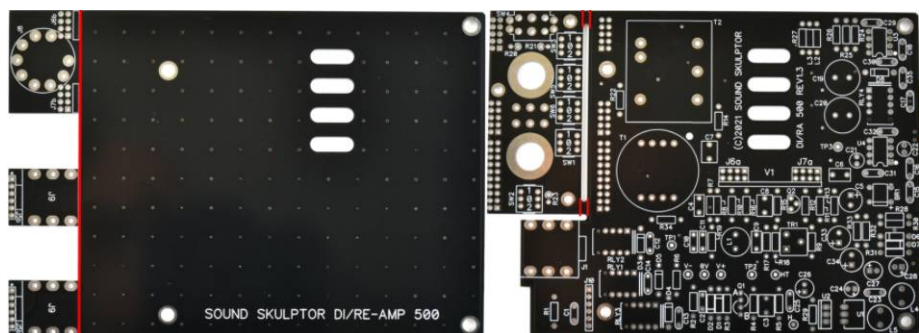
<http://www.eevblog.com/2011/06/19/eevblog-180-soldering-tutorial-part-1-tools/>

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

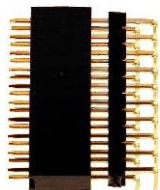
## DI503J Assembly guide – Main PCB

### 1. PCB split

Split the PCB into 6 parts along the grooves. Use extra thin sandpaper to polish all the rough sides



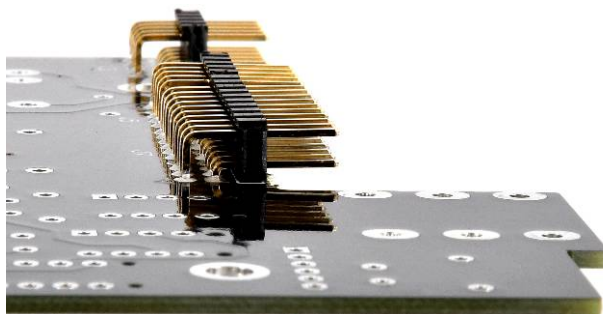
## DI503J Assembly guide – Main PCB



### 2. PCB to PCB connector J3, J5, J7

Insert the male 2x10 and the two 2x5 connectors into their places at the back of the main PCB. Solder one pin, check that the contacts are perfectly parallel to the PCB then solder the other pins.

**Warning** : These connectors are inserted at the back of the PCB and soldered on the components side.



### 3. 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 resistor values 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 $\Omega$  (brown-black-black-brown-brown) can be confused with 110 $\Omega$  (brown-brown-black-black-brown).



### 4. Diodes

Add D1 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.

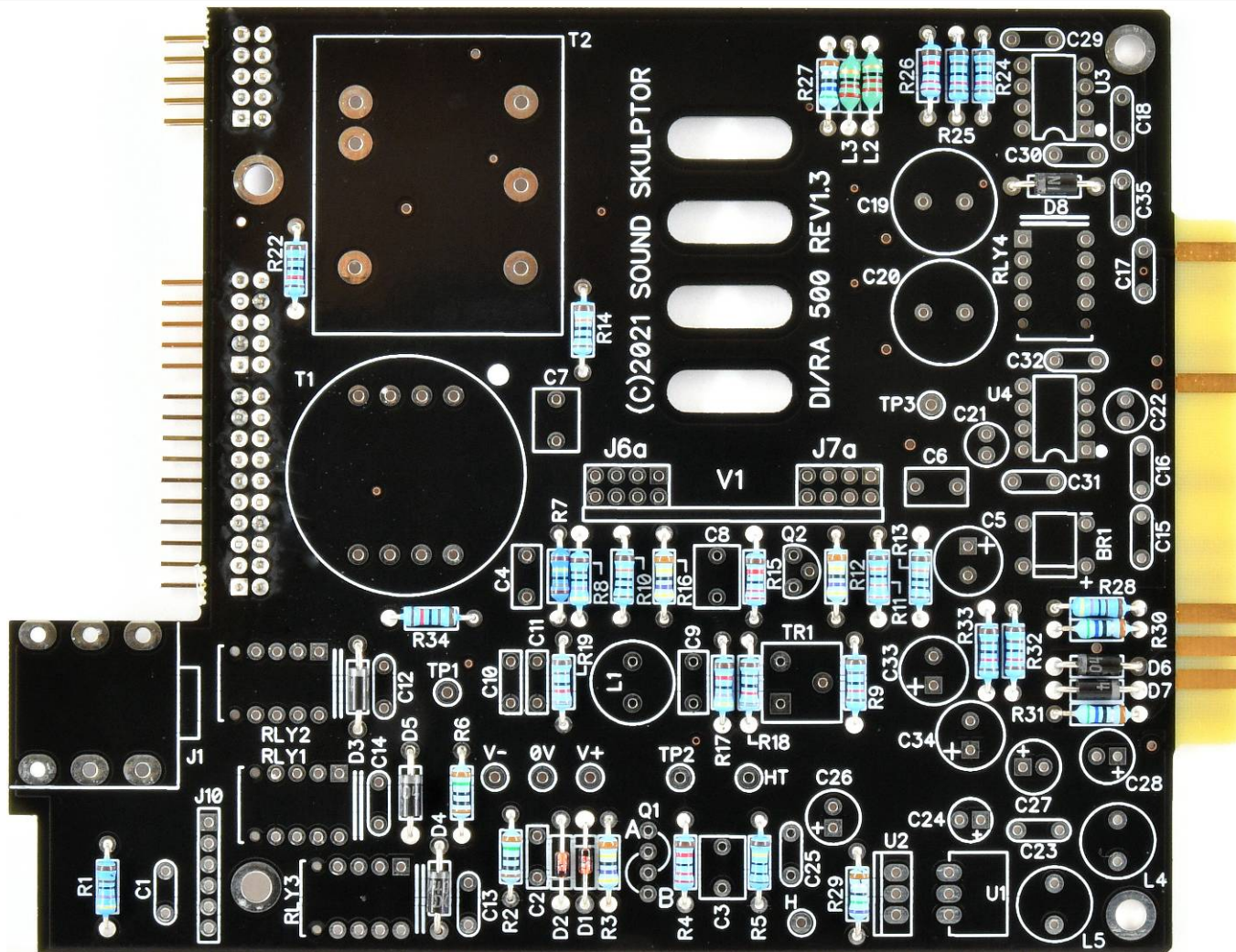


### 5. Axial Inductors

Add L2, L3.



### DI503J Assembly guide – Main PCB



#### 6. Ceramic capacitors



Add the ceramic capacitors.

#### 7. 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.

#### 8. IC Socket



Insert and solder the two 8 pins socket in U3 and U4.

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

#### 9. Relays



Add RLY1 to RLY4.

**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.

## DI503J Assembly guide – Main PCB



## 10. 1 turn trimmer

Insert and solder the one turn trimmer TR1.



## 11. Test pins

Solder the 8 test pins TP1, TP2, TP3, OV, V+, V-, H+, HT.



## 12. Small film capacitors

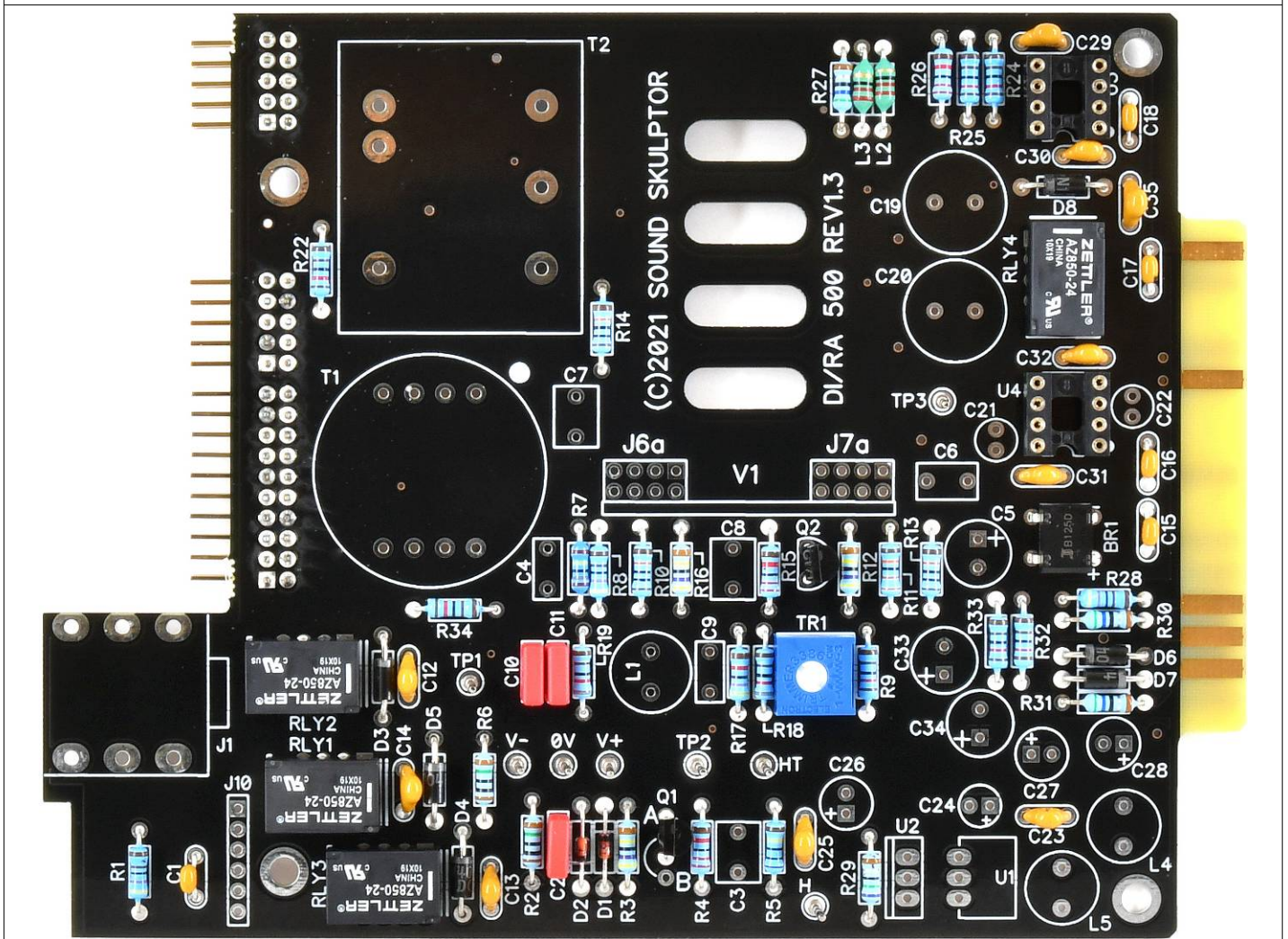
Add the small film capacitors C10, C11, C2.



## 13. Transistors

Add Q1 and Q2.

**Warning:** Watch out the transistors direction. Q1 goes into position A.



## DI503J Assembly guide – Main PCB

**14. Connector**

Solder the connector socket J10. Solder one pin first, check verticality, then solder the other pins.

**15. Large film capacitors**

Add the larger film capacitors C4, C9, C6, C3, C7, C8.

**16. Non polarized small electrolytic capacitors**

Add C21, C22.

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

**17. Electrolytic capacitors**

Add the electrolytic capacitors C24, C26, C27, C28, C5, C33, C34.

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

**18. Radial inductors**

Add L1, L4, L5.

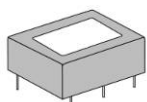
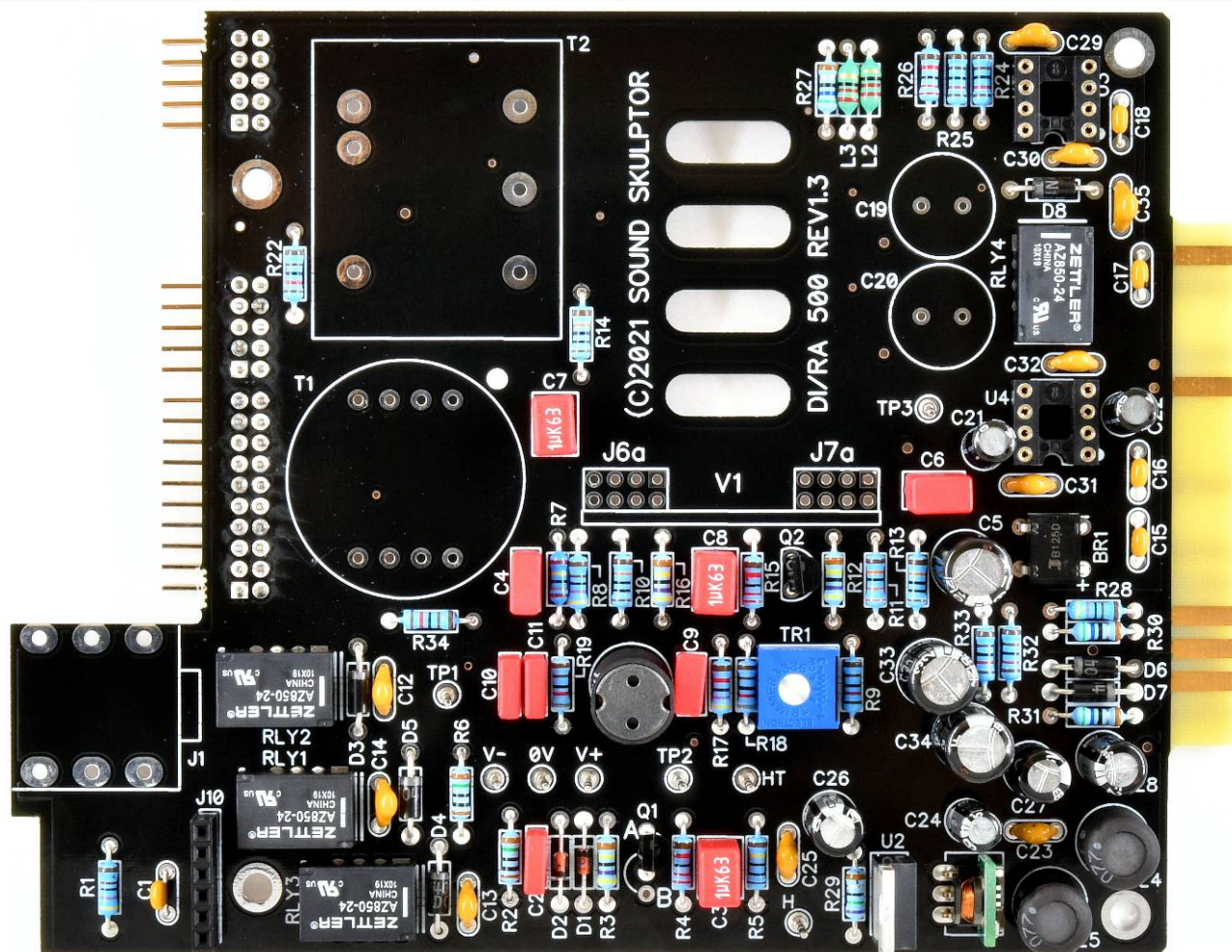
**19. U1 and U2**

Insert and solder U1 and U2.





DI503J Assembly guide – Main PCB



20. Transformer T2

Insert and solder transformer T2 (Z3002C).



21. Jack connector

Add J1. The position of the socket is important for a good front-plate matching. It must sit flat on the PCB.

**Warning:** the hole must face outside the PCB ;-)



22. Transformer T1

Place the insulation disc at the base of the transformer JT-DB-EPC and insert it in T1. The correct direction is marked by a dot on the transformer. It must match the dot on the PCB.

**Warning:** do not mount it in the wrong direction.



23. Large electrolytics

Add C19 and C20.

These capacitors are bipolar so they can be inserted in any direction.

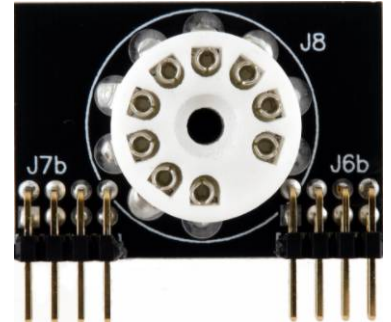
## DI503J Assembly guide – Main PCB

**24. Tube PCB**

Solder the two 2 x 4 pins 90° pin headers. Solder one pin first, check the header sits flat on the PCB, then solder the other pins.

Solder the tube socket and cut the pins flush.

Insert the tube PCB into the main PCB. Solder one pin, check the verticality then solder the other pins.

**25. Jack socket PCB**

Solder the 6 pins header to the jack PCB. Two PCB's are available but only one is needed.

Check that the pins are perfectly perpendicular to the PCB.

Next solder the jack socket.

**26. U3, U4**

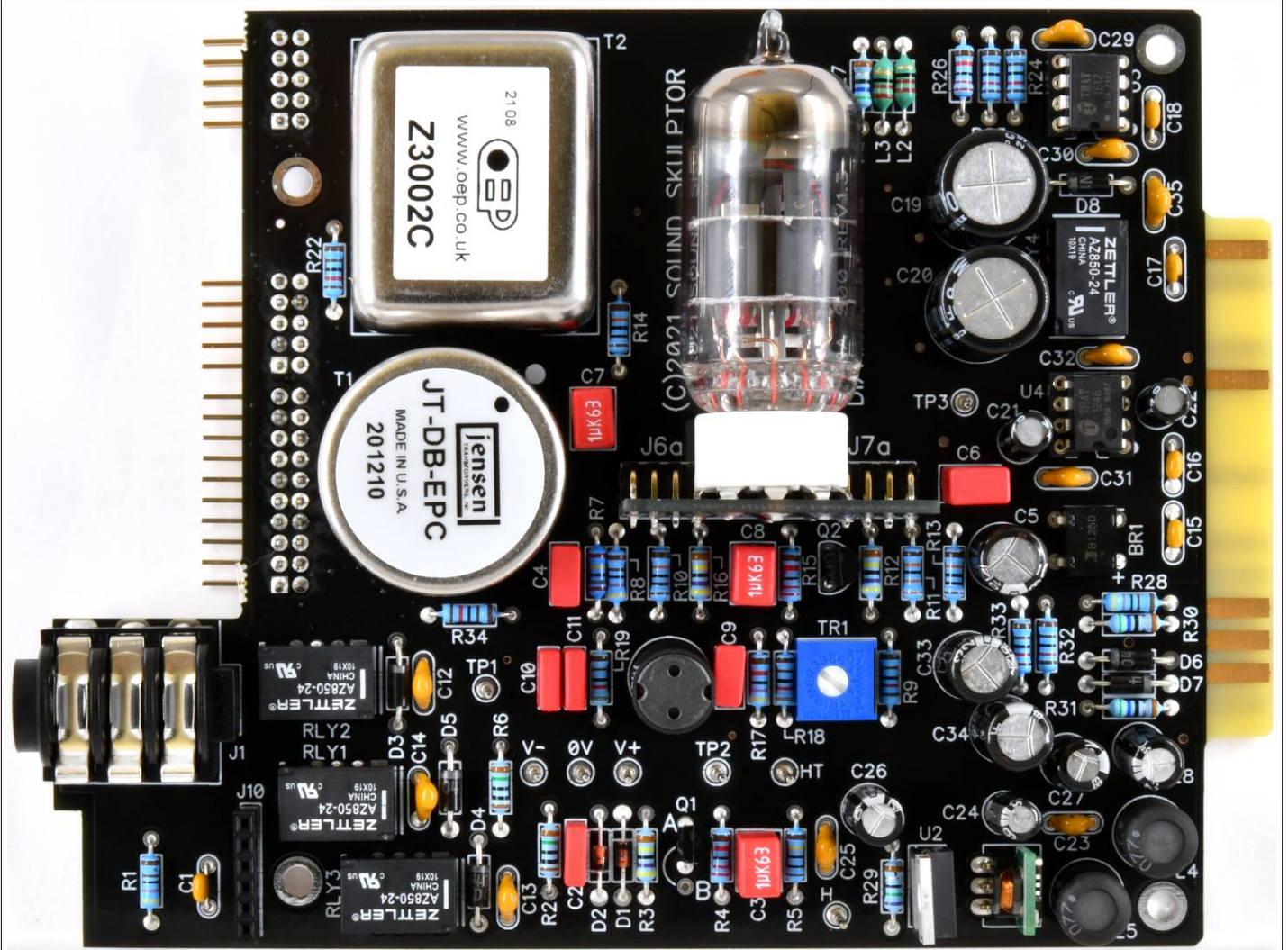
Insert the two integrated circuits U3 and U4 into their respective sockets.

**Warning** : these two parts are different and have a direction identified by a notch or a dot.

**27. Tube**

Carefully insert the tube into the noval socket.

## DI503J Assembly guide – Main PCB



## 28. Visual check

Check that all component leads are cut short, in order not to risk touching the chassis plate. 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?

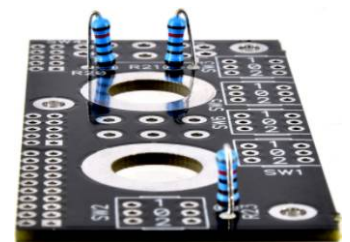
When everything looks correct, proceed with the other boards assembly.

## DI503J Assembly guide – Front PCB

## 29. Resistors

Add R20, R21, R23.

The resistors on the front PCB are installed vertically.





## DI503J Assembly guide – Front PCB



### 30. Push switches

Insert the push switches SW1, SW2, SW3, SW5, SW6 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.



### 31. Toggle switch

Add the toggle switch SW4.

**Warning** : The position of the switches is critical for a good front-plate matching. It must sit flat on the PCB. Press firmly the switch on the PCB and solder two opposite pins (housing). Check position then solder the other pins.



### 32. Connectors J4, J6, J8

Insert the two 2x5 and one 2x10 female connectors at the back of the PCB and solder on the switches side.

**Warning** : Be very careful not to touch any other component with your iron tip while soldering.



### 33. Potentiometers

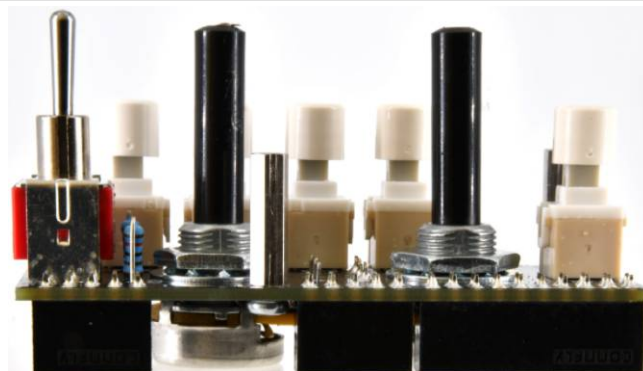
Add P1 and P2. Insert the potentiometers into the PCB holes from the back side, fitting the pins into the corresponding PCB pads. Attach with washer and nut, tighten to ensure a perfect perpendicular position and solder.

**Warning** : Be very careful not to touch any other component with your iron tip while soldering. After soldering carefully, you can clip the push button caps on.



### 34. Spacers

Attach three M2.5x15mm spacers on the components side of the PCB and attach with three M2.5x6mm screws.



## DI503J Assembly guide – Final assembly

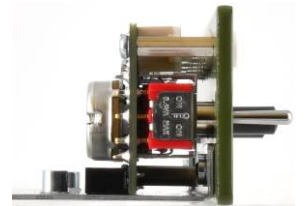
### 35. Front panel assembly

Insert and attach the front panel to the front PCB with three M2.5x8mm black screws.



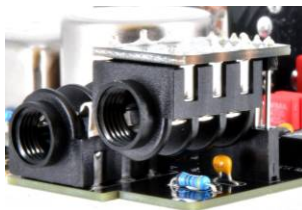
### 36. Chassis plate assembly

Attach the chassis plate to the front plate with two M3x6mm black screws.



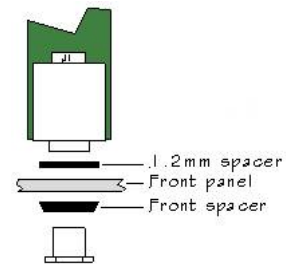
### 37. Main PCB assembly

Insert the jack socket PCB header connector into J10 on the main PCB.



Place one 1.2mm plastic spacer on the two jack sockets and insert the main PCB connectors (J1, J2, J3) into the matching front PCB sockets.

Screw in the jack noses through a beveled front spacer with an M1.1 socket spanner.



### 38. Spacers

Screw four nuts to the four M3x25mm spacers and use them to attach the main PCB to the chassis



### 39. Knobs

Attach the 2 knobs.

### 40. Cover

Attach the cover with 4 M3x6mm countersunk screws.

### 41. Congratulations

You're done!

D1503J Assembly guide – Final assembly

