



## MU524 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:

- MU524 Schematics
- MU524 Components layout
- MU524 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:

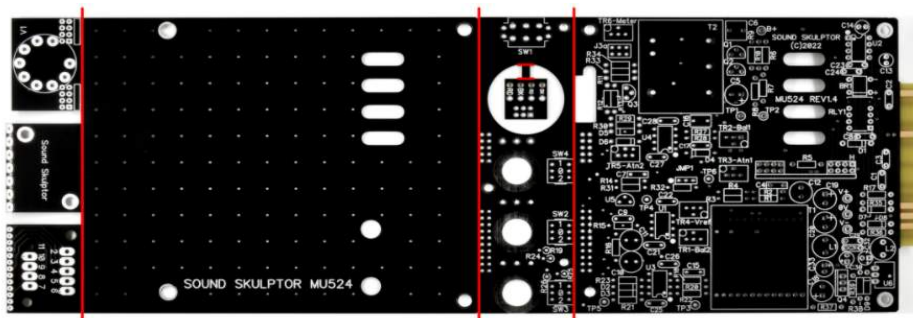
<http://www.eevblog.com/2011/06/19/eevblog-180-soldering-tutorial-part-1-tools/>

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

## MU524 Assembly guide – Main PCB

### 1. PCB split

Split the PCB into 7 parts along the grooves. Use extra thin sandpaper to polish all the rough sides



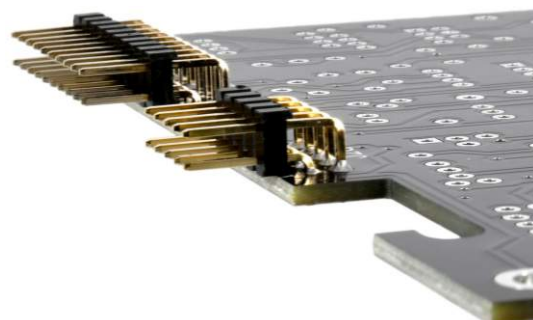
## MU524 Assembly guide – Main PCB



### 2. PCB to PCB connector J1a, J2a

Insert the male 2x10 and 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 1k $\Omega$  (brown-black-black-brown-brown) can be confused with 110 $\Omega$  (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.



### 4. Diodes

Add D1 to D9. 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.



## MU524 Assembly guide – Main PCB

### 9. Small film capacitors



Add the small film capacitors C4, C7, C15.

### 10. Transistors and U5

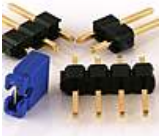


Add Q1, Q2, Q3 and U5.

**Warning:** Q3 (2N7000) is a sensitive device which can easily be destroyed by static electricity. Make sure you are not charged before manipulating it (simply work without your shoes on).

**Warning:** Watch out the direction.

### 11. Jumper header

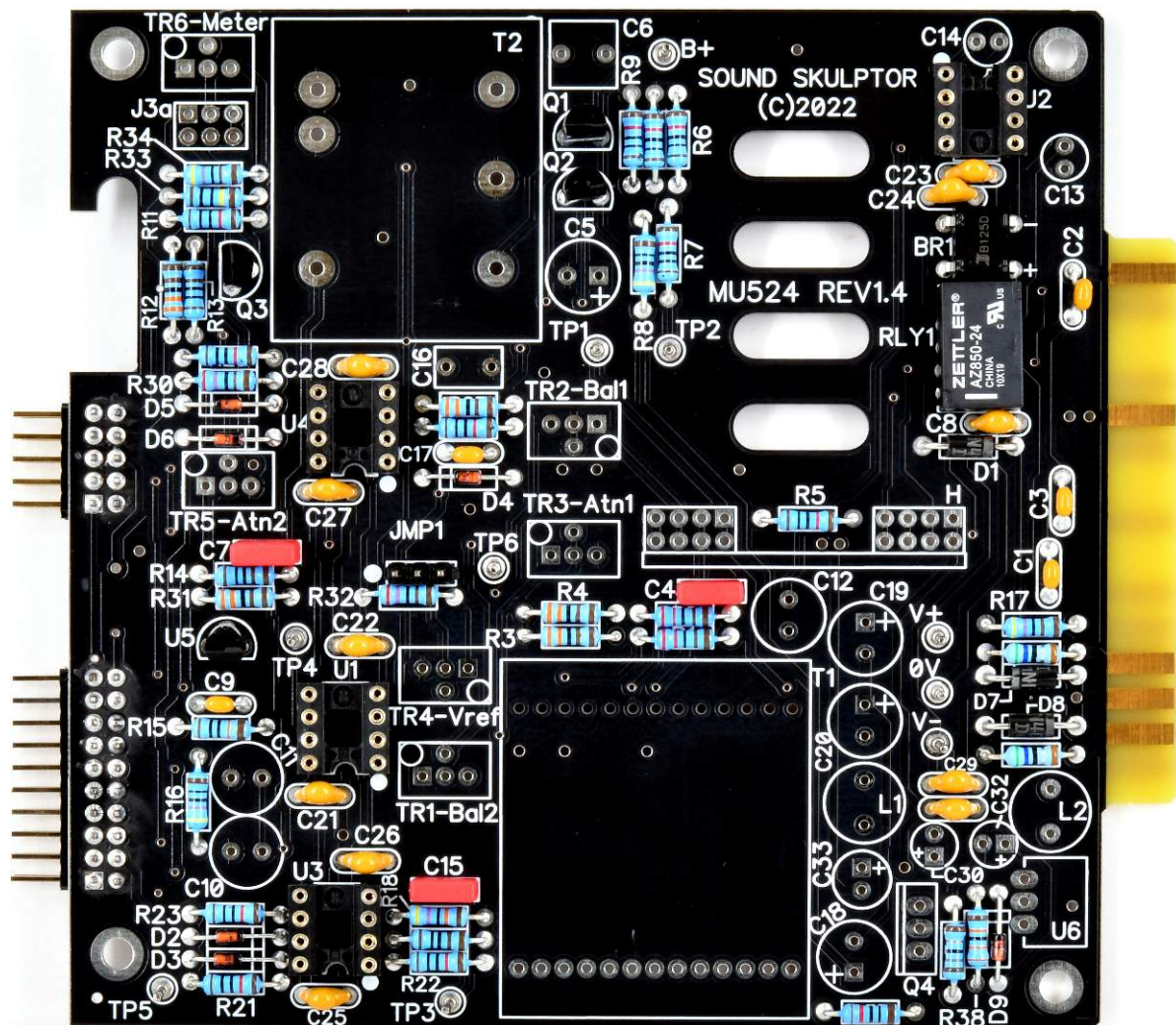


Add the 3 pins JMP1 jumper header.

### 12. Test pins



Solder the IO test pins TP1, TP2, TP3, TP4, TP5, TP6, OV, V+, V-, B+.



## MU524 Assembly guide – Main PCB



### 13. Connector J3a

Add the 2x3 pins female connector J3a



### 14. Large film capacitors

Add the larger film capacitors C16 and C6.



### 15. Trimmer potentiometers

Add the 6 trimmer potentiometers TR1 to TR6. Solder one pin, check verticality then solder the other pins.



### 16. Capacitor C12

This capacitor is going to be very close to the input transformer PCB and to the tube PCB. Leave a few millimeters of wire under the capacitor to allow some movement and thus prevent the PCB pins from piercing the insulation and touching the capacitor case.



### 17. Other non polarized electrolytic capacitors

Add C13, C14, C10, C11.

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



### 18. Electrolytic capacitors

Add the electrolytic capacitors C30, C32, C33, C5, C18, C19, C20.

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



### 19. Radial inductors

Add L1, L2.



### 20. Q4

Insert and solder Q4.

**Warning** : The direction is marked by a double line at the back of the transistor.



### 21. UG

There are two versions of UG.

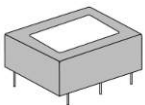
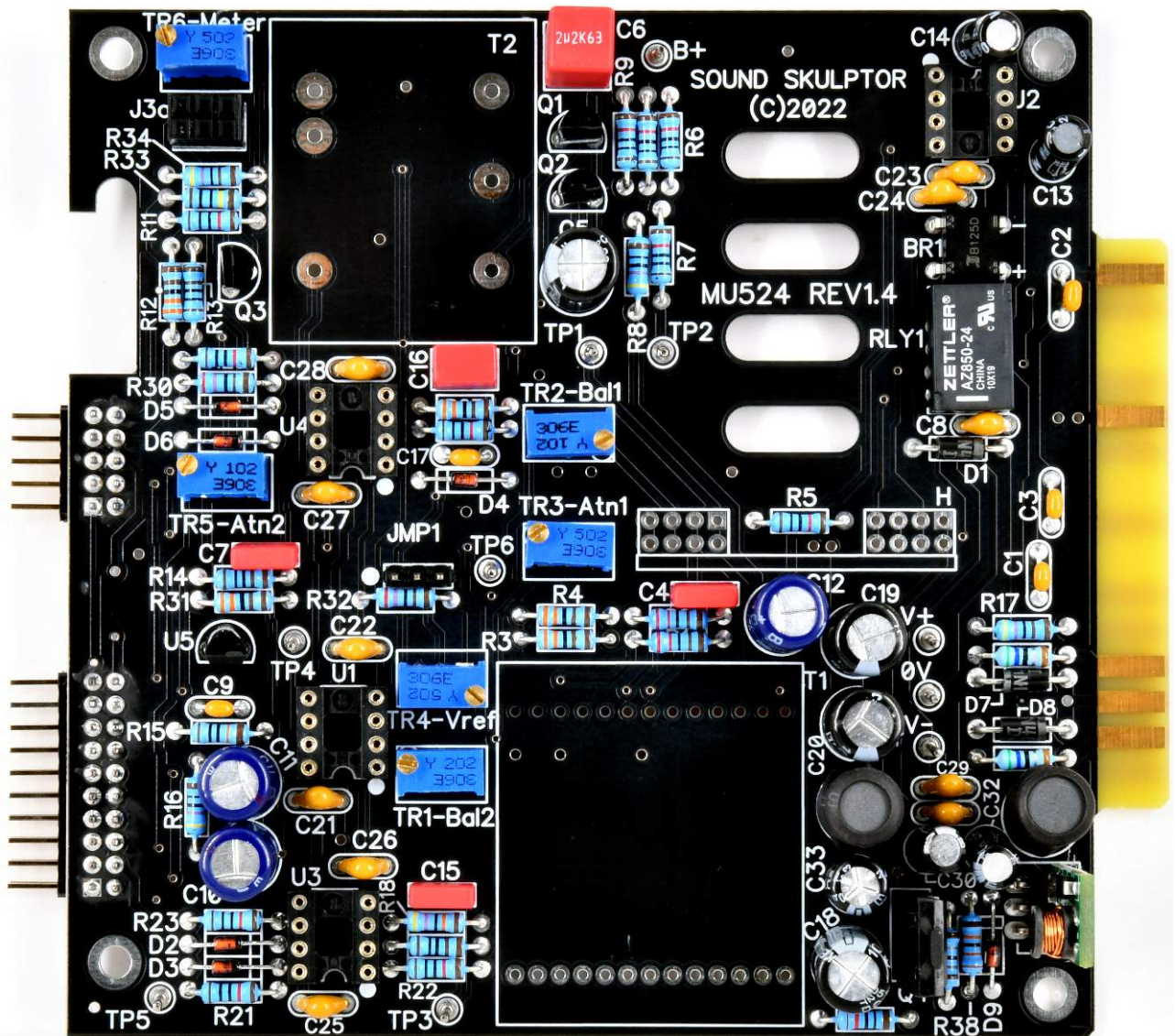
It is recommended to use one of each when two compressors are used as a stereo pair. They work at a very different frequency (150kHz apart) which insure there will be no hiss at the difference of the frequencies in the output.

Insert and solder UG.

The the small coil must face towards Q4.



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**22. Transformer T2**

Stick a small piece of adhesive rubber under the transformer T2 (Z3002C) so that the metal case does not touch the PCB traces.

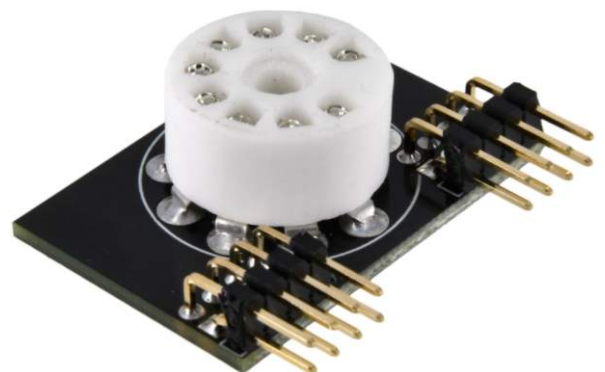
Insert and solder the transformer.

**23. Tube support PCB**

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

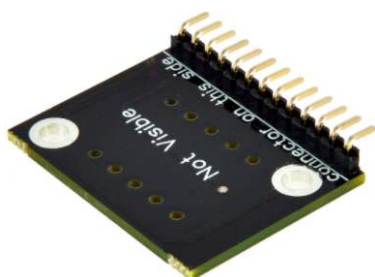
Solder the tube socket and cut the pins flush.

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



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### 24. Transformer T1 front PCB



Use the input transformer front PCB, the one with the pin holes and numbers. Insert the 90°, 13 pins headers, long tails first, into the holes, from the bottom side, marked "Not visible".

Use the supplied jumpers to hold the connector in position while you solder one pin. Remove the jumpers and solder the other pins. Cut the straight pins sharp.



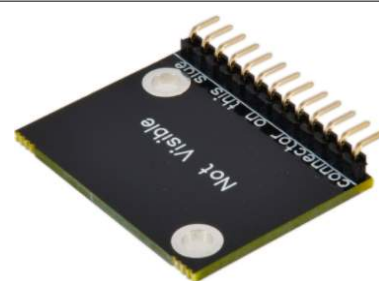
**Warning** : the pin headers must sit perfectly perpendicular to the PCB surface for a good matching with the main PCB.

**Warning** : Cut the pins extremely short because there is a risk of touching the nearby components R1, R3, C12 which must absolutely be avoided.

### 25. Transformer T1 back PCB

Insert the 90°, 13 pins headers, long tails first, into the holes, from the side marked NOT VISIBLE.

Solder one pin, adjust the position then solder the other pins. Only one pin out of two are soldered. Cut the straight pins sharp.



### 26. Transformer T1 assembly



Remove the 2 screws from the transformer pin side and insert the front PCB on top of the transformer, checking the pins number correspondence and with the NOT VISIBLE text hidden. Assemble with the 2 screws. If there is play between the parts, pull the transformer down so that it does not protrude from the PCB top. Solder the transformer pins (pin 11 is not soldered).

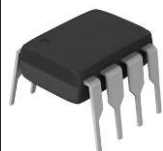
Remove the 2 screws from the transformer back side and attach the back PCB with the NOT VISIBLE text hidden. Assemble with the 2 screws.

Insert the transformer into the main PCB and solder the 26 pins.

**Warning**: the transformer pins face up, towards the tube.



### 27. Integrated circuits



Insert the four integrated circuits U2, U1, U3, U4 into their respective sockets.

**Warning** : U2 is different from the others. The IC's have a direction identified by a notch or a dot.

### 28. Tube



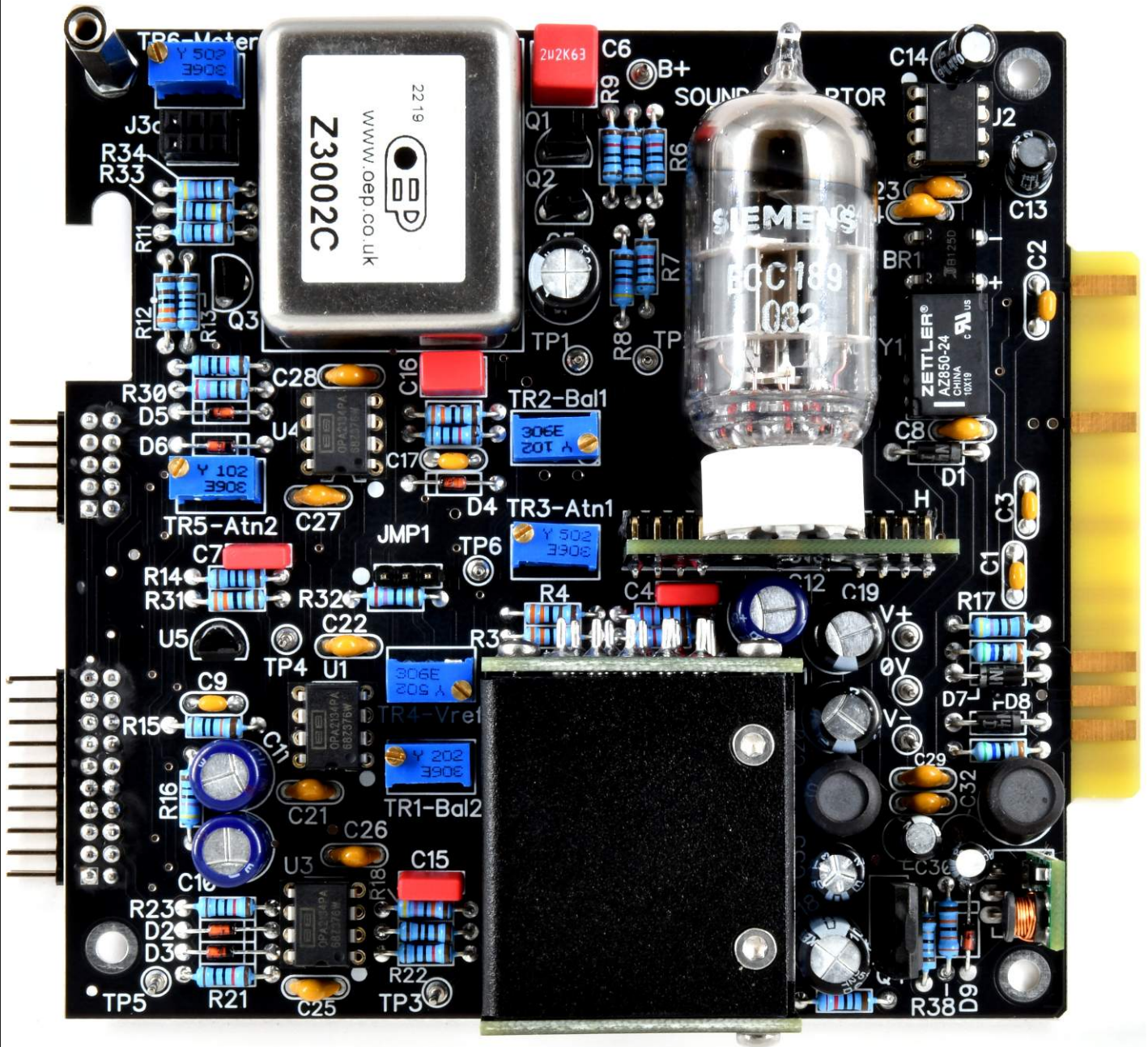
Carefully insert the tube into the noval socket.

## MU524 Assembly guide – Main PCB



### 29. Fem/fem spacer

Insert a M3x10mm screw from below PCB, in the upper left hole. Add an M3 nut and tighten then add a 25mm spacer and tighten.



### 30. 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?

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



## MU524 Assembly guide – Front PCB



### 31. Resistors

Add R19, R24, R25, R26.

The resistors on the front PCB are installed vertically.



### 32. Push switches

Insert the push switches SW2, SW3, SW4 flat on the PCB, in the correct direction and solder one pin. Check again the good position then solder the other pins.

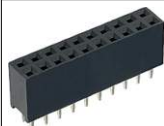
**Warning** : The switch direction is given by the digits 2 0 1, engraved on one side of the switch. Match the digits with the ones on the PCB.



### 33. Toggle switch

Add the toggle switch SW1.

**Warning** : The position of the switch 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. Check position then solder the other pins.



### 34. Connectors J1b, J2b

Insert the 2x5 and 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.



### 35. Potentiometers

Add P1, P2 and P3. 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.



### 36. Spacers

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

## MU524 Assembly guide – Front PCB



## MU524 Assembly guide – Meter assembly



### 37. Connector

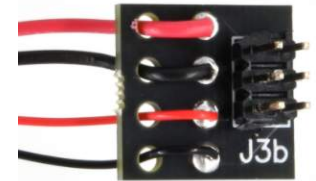
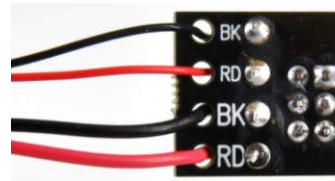
Solder the 2x3 pins header to the small meter PCB.



### 38. Meter connections

There are 2 wire colors and 2 sizes.

Insert the corresponding color and size wires into the PCB holes and solder.



### 39. Meter mounting

Insert the meter in position on the front panel and attach with 4 M2x14mm screws and nuts.

## MU524 Assembly guide – Final assembly

### 40. Front panel assembly

Insert and attach the front panel to the front PCB with three M2.5x6mm black screws.

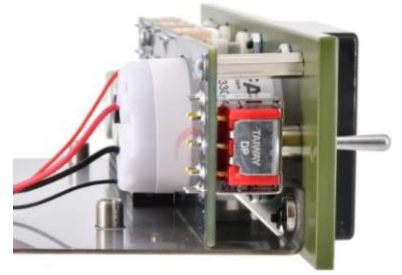




## MU524 Assembly guide – Final assembly

### 41. Chassis plate assembly

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



### 42. Main PCB assembly

Insert the main PCB by matching the J1 and J2 connectors.  
Connect the meter connector to the matching socket.

### 43. Spacers

Screw 3 nuts to the 3 M3x25mm spacers and use them to attach the main PCB to the chassis

The fourth hole in the chassis plate receives a M3x6mm countersunk screw.



### 44. Knobs

Attach the 3 knobs.

### 45. Setup

Time to setup. Follow the setup guide.

### 46. Cover

Attach the cover with 4 M3x6mm countersunk screws.

### 47. Congratulations

You're done!



### MU524 Assembly guide – Final assembly

