MC624 Assembly guide

Safety warning

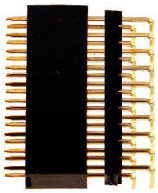
The kits are main powered and use potentially lethal voltages. Under no circumstance should someone undertake the realisation of a kit unless he has full knowledge about safely handling main powered devices.

Please read the "DIY guide" before beginning.
Print or open the following documents :

- MC624 Schematics
- MC624 Components layout
- MC624 Parts list
- MC624 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.

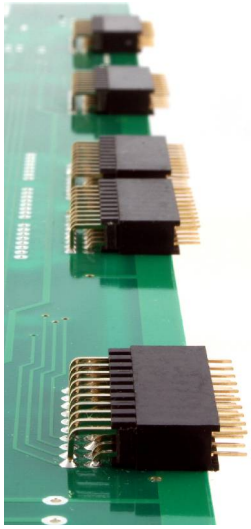
MC624 Assembly guide – Main PCB



1. PCB to PCB connectors

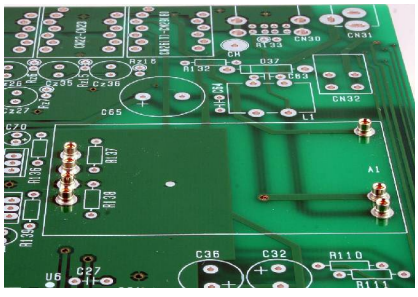
Insert the male, 90° angled, 2x10 connectors into the corresponding 2x10 sockets and put them in place, flat **under** the PCB. Solder.

Warning : The connectors are installed ***on the solder side*** of the PCB, that is the side with no writing.



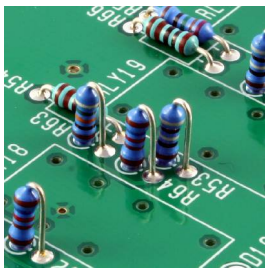
2. PSU Switcher-2 pin sockets

Solder the 7 pin sockets for the Switcher-2 PSU. Solder one at a time. Insert the 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 PSU.



MC624 Assembly guide – Main PCB

3. Resistors



Add R1 to R143 (except R131 which is located on the front PCB). The resistors marked NC in the parts-list should not be installed.
The best way to proceed is to pick a resistor band in the bag, measure the value with the digital multimeter, find the value in the parts list, and find the corresponding resistor references. Find these references on the PCB, place and solder the resistors.
Warning :Some resistors are placed vertically. Bend one leg 180° and insert.
The horizontal resistors must be bended at 0.4".

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-brewn-black-black-brown).

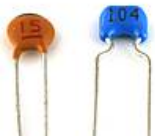
There are 4 extra 47K resistors which can be used to cancel possible click noise (details in the user manual).

4. Horizontal diodes

Add D1 to D8, D35, D36. Use a lead forming tool to bend the leads at 0.4".
Add D37, leads bended at 0.6".
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. IC Sockets

Insert and solder the IC sockets: 10 x 8 pins, 9 x 16 pins, 1 x 28 pins.
Warning : Make sure to respect the socket direction, marked by a notch on the socket, corresponding to a dot on the PCB.



6. Ceramic capacitors

Add C1, C2, C4, C5, C7, C8, V11, C12, C15, C17, C18, C19, C21, C22...C28, C31, C33, C35, C37, C38, C41, C43, C45, C47...C50, C54...C64, C74, C75.

7. Crystal

Add XT1. Leave a 1mm space between the crystal case and the PCB.

8. Resistor networks

Add RN1 to RN3, RN8 to RN13.
Warning : RN1 to RN3 are polarized and must be mounted in the right direction identified by a dot on the resistor network and a dot on the PCB.

9. Test pins

Solder the 20 test pins. Insert from the component side, short part first. Use pliers because they need some pressure to get in.

10. Chassis pin

Solder the 1.3mm chassis pin, marked CH near the upper right corner of the PCB.

MC624 Assembly guide – Main PCB

11. Jumper headers

With the cutting pliers, split the 27 pins strip into nine 3 pins headers. Solder the jumper headers JMP1 to JMP9. Solder one pin first, check verticality, then solder the other pins.

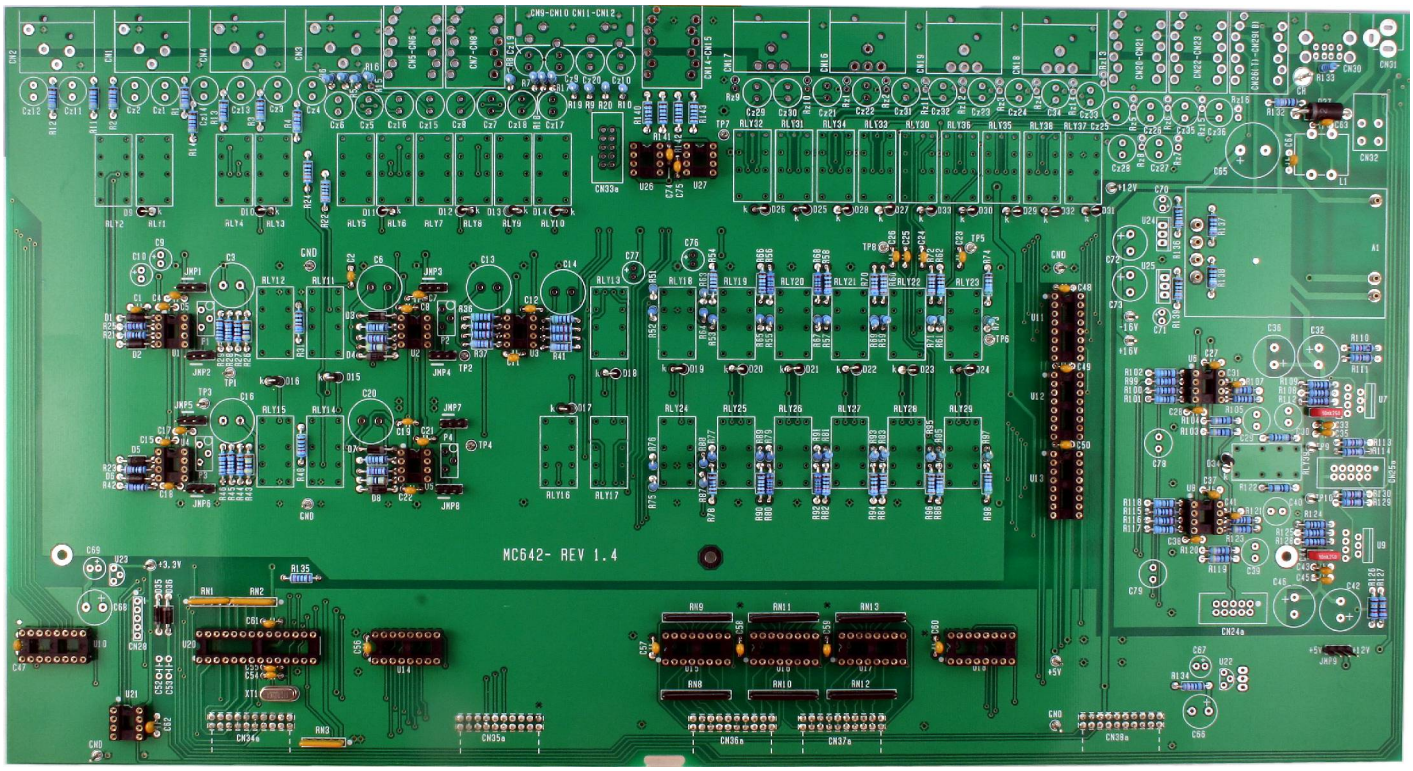
12. Vertical diodes

Solder the vertically mounted diodes: D9...D34.

Warning: The diodes are polarized and must be installed in the correct direction. Fold the cathode lead, identified by a ring on the diode body. The cathode is marked K on the PCB.

13. Film capacitors

Add C34 and C44.



14. Regulators

Add U22 & U23.

Warning : Watch out the regulator direction.

15. IDC connectors

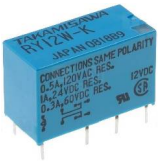
Add CN24a, CN25a, CN33a.

Warning : Check the position of the slot, it must not be mounted backwards.

MC624 Assembly guide – Main PCB

16. Trimmer potentiometer

Add P1 to P4. Solder one pin, check verticality then solder the other pins.



17. Relays

Add RLY1 to RLY39.

18. Small electrolytic capacitors

Add C9, C10, C29, C30, C39, C40, C66...C73, C76...C79.
Solder one lead first, adjust verticality then solder the second lead.
Warning : Some electrolytic capacitors (ex: C29, C30) are not polarized and can be inserted in any direction. The other ones must absolutely be inserted in the correct direction, longest lead going into the +hole. Do not reverse (or they may explode !)

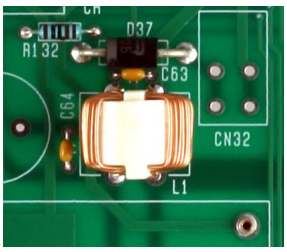
There are 4 extra 100uF bipolar capacitors which can be used to cancel click noise (details in the user manual).

19. DC connector

Add the DC input connector CN31. Make sure it sits perfectly flat on the PCB.

20. Common mode coil

Add L1.
Warning : Do not mount with a 90° twist, it would cause a power short circuit (check picture).



21. Wire terminal bloc

Insert and solder the wire terminal bloc CN32, the wire holes facing towards the front panel.

22. Voltage regulators

Add U24 & U25. Solder one pin first, check verticality and solder.
Warning : Watch out the device direction, the metal tab at the back of the device is symbolized by a double line on the PCB marking.

23. Power amps

Add U7 and U9.
Solder one pin first, check verticality and solder.

24. Dual connector

Add the dual USB type connector CN30. Make sure it sits perfectly flat on the PCB.

MC624 Assembly guide – Main PCB

25. XLR male sockets

Add the 4 male XLR sockets CN16 to CN19. Make sure they sit perfectly flat on the PCB.

26. XLR female sockets

Add the 4 female XLR sockets CN1 to CN4. Make sure they sit perfectly flat on the PCB.

27. RCA connectors

Add the quad RCA connector CN9...CN12. Make sure it sits perfectly flat on the PCB.

28. Jack connectors

Add the 6 dual jack sockets : CN5/6, CN7/8, CN14/15, CN20/21, CN22/23, CN26/29.
Make sure they sit perfectly flat on the PCB.

29. Large electrolytics

Add C3, C6, C13, C14, C16, C20, C32, C36, C42, C46, C65. Solder one lead first, adjust verticality then solder the second lead.

30. Spacers

Attach three 5mm spacers below the PCB with three M3x5mm screws.
Warning : Do not confuse the 5mm spacers with the 6mm spacers used on the front panel PCB.

31. IC's

This step is done at testing time.
Insert U1...U6, U8, U10...U18, U20, U26, U27 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 on the IC ans a dot on the PCB.

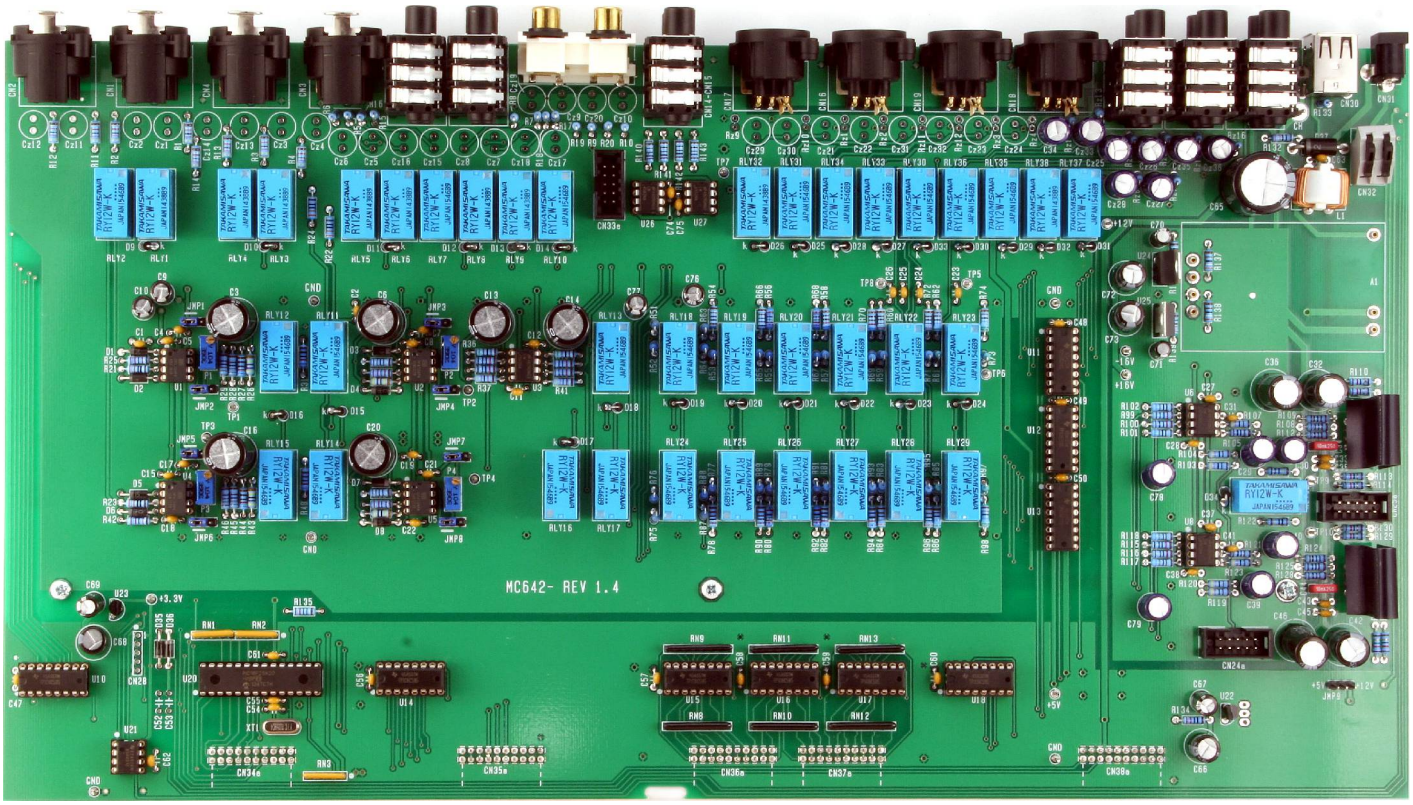
32. Jumpers

If you are using the standard IC's, insert 8 jumpers on JMP1 to JMP8, at the position marked by a line on the PCB.

33. Heatsinks

Insert two clip heatsinks on U7 & U9.

MC624 Assembly guide – Main PCB



In the above picture, optional components Cz25…Cz28, Cz33…Cz36 and Rz5…Rz8, Rz13…Rz16 are installed on outputs 3 and 4.

34. 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.

MC624 Assembly guide – front PCB assembly

1. Resistor

Add R131.

2. Resistor networks

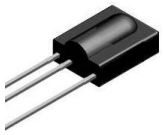
Add RN4 to RN7.

Warning : RN4 to RN7 are polarized and must be mounted in the right direction identified by a dot on the resistor network and a dot on the PCB.

3. Capacitor

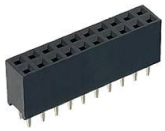
Insert C51 all the way down then bend it over to make it rest flat on the PCB. Solder.

MC624 Assembly guide – front PCB assembly



4. U19

Insert U19 all the way down then bend it over to make it rest flat on the PCB, the curved side facing up. Solder.



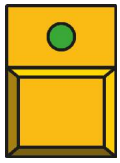
5. Sockets 2x10 pins

Solder five 2x10 connectors, inserted from the solder side.

6. Seven segment display

Insert and solder the three seven segment displays.

Warning : The digital dot is down. Do not reverse.



7. Key switches

Insert and solder the 15 key switches in the following order from left to right:
[YEL YEL WHT WHT YEL YEL] [YEL WHT WHT WHT YEL] [YEL WHT WHT YEL]

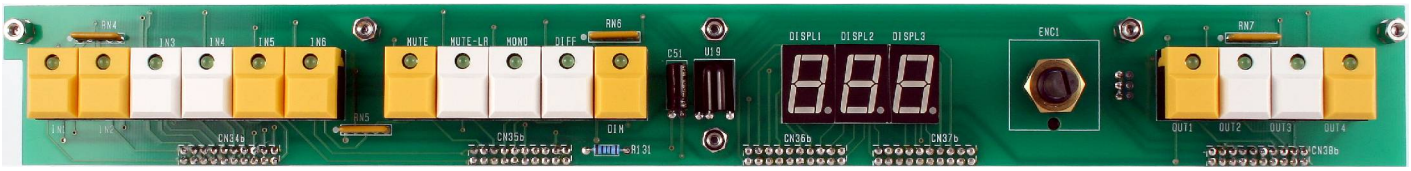
Warning : Make sure to sit the switches perfectly flat on the PCB.

8. Rotary encoder

Insert the rotary encoder from below PCB, fitting the 3 pins into the corresponding holes. Attach with lockwasher and nut. Solder the 3 pins.

9. Spacers

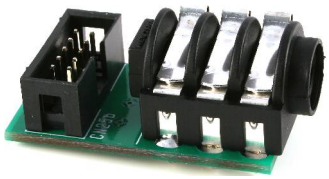
Attach six 6 mm spacers with six M3x5 mm pan head screws, inserted from the solder side. Do not tighten yet.



10. Headphone jack PCB

Insert the 2 x 5 pins IDC header on the silk screened side, taking care of the slot position and solder.

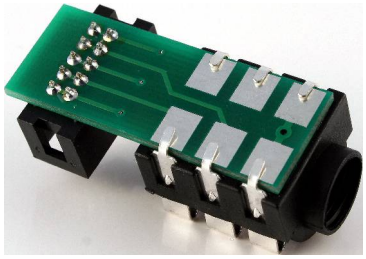
Solder the jack socket and cut the pins flush.



11. Font input jack PCB

Solder the 2 x 5 pins IDC header on the silk screened side, taking care of the slot position.

Place the jack socket and bend the 6 pins over until they are flat on the opposite side. Make sure the pins are in the centred on the pads and solder.

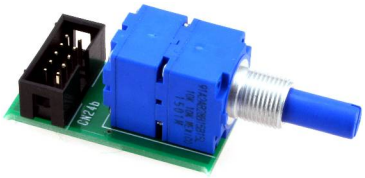


MC624 Assembly guide – front PCB assembly

12. Potentiometer PCB

Solder the 2 x 5 pins IDC header on the silk screened side, taking care of the slot position.

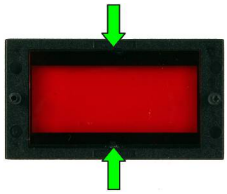
Solder the dual potentiometer.



MC624 Assembly guide – Final assembly

1. Display filter (1)

Remove the protecting film on both sides of the red filter and place it on the frame. Lock it in position with two very small drops of instant glue at the arrow positions on the picture.



2. Display filter (2)

Cut 2 lengths, 3mm each, of neoprene tube, and insert them on the two fixing studs on the frame, in order to increase their diameter.

3. Display filter (3)

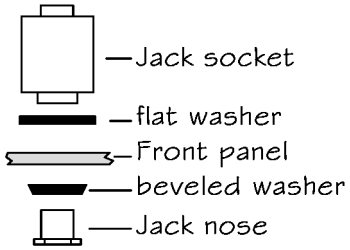
Insert the filter frame into the front panel and lock it in place with 2 locking washers. You can secure the assembly with a little glue on the 2 locking washers.

4. Front panel and PCB assembly

Attach the front PCB to the front panel with six M3 x 6 mm countersunk black screws. Now you can tighten the six M3 x 5mm pan head screws on the other side of the spacers.

5. Headphone jack assembly

Insert the headphone jack (connectors CN25b, CN27) into the rightmost panel hole, PCB on top and screw in the front nut through the bevelled washer. Add a flat washer at the back of the panel if necessary. Tighten very gently.
Plug in the 13cm long ribbon cable



6. Input 6 jack assembly

This step is better done at test time, after insertion of U10 in the digital test step 3.
Insert the input jack (connectors CN33b, CN13) into the leftmost panel hole, PCB on top and screw in the front nut through the bevelled spacer. Add a flat washer at the back of the panel if necessary. Tighten very gently. Plug in the 33cm long ribbon cable

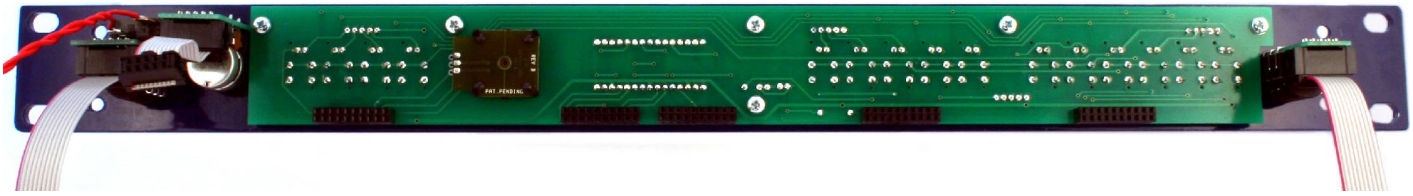
7. Potentiometer assembly

Insert 2 M10 washers on the potentiometer bushing and insert the potentiometer into the headphone level hole, PCB on top, insert lockwasher and screw the nut.
Plug in the 7cm long ribbon cable

MC624 Assembly guide – Final assembly

8. Power switch assembly

Solder two 23 cm red wires to the contacts of the power switch then clip it into the front panel cutout. Strip 5mm out of the other end of the wires and tin. Twist the wires together.



9. Back panel assembly

Insert the back panel on the connectors. Start by the four female XLR locking levers into their corresponding holes then insert the dual jacks. Attach with 16 self taping pan head screws on the XLR connectors and 7 self taping countersunk head screws on the jack connectors.

10. Case connection

Insert a solder tag and a lockwasher on a M3x16mm pan head screw. Insert the screw into the backplate, from inside. Insert an M3 washer and attach with a M3 nut. Finally, add a metal washer and a thumb nut.
Strip 5mm on both ends of a 5cm black wire. Solder one end to the 1.3mm socket. Solder the other end to the case solder tag.
Plug the 1.3mm socket on the 1.3mm chassis (CH) pin.

11. Side panels

Assemble the backplate and the two sides of the case with four black M4 countersunk screws.
The external face of the side is the one with two grooves.

12. Top and bottom fixing nuts

Insert two M3 nuts into the top and bottom grooves of both sides of the case (for a total of 8 nuts). They will be used to attach the top and bottom covers.

13. Front panel

Insert the main PCB connectors into the front PCB sockets.
Attach the front panel to the sides with four black M4 countersunk screws.

14. Connections

Plug the ribbon connectors:

- from input 6 jack into CN33a
- from headphone potentiometer into CN24a
- from headphone jack into CN25a

Lift the 2 levers on CN32, insert the two red wires from power switch and lock down.

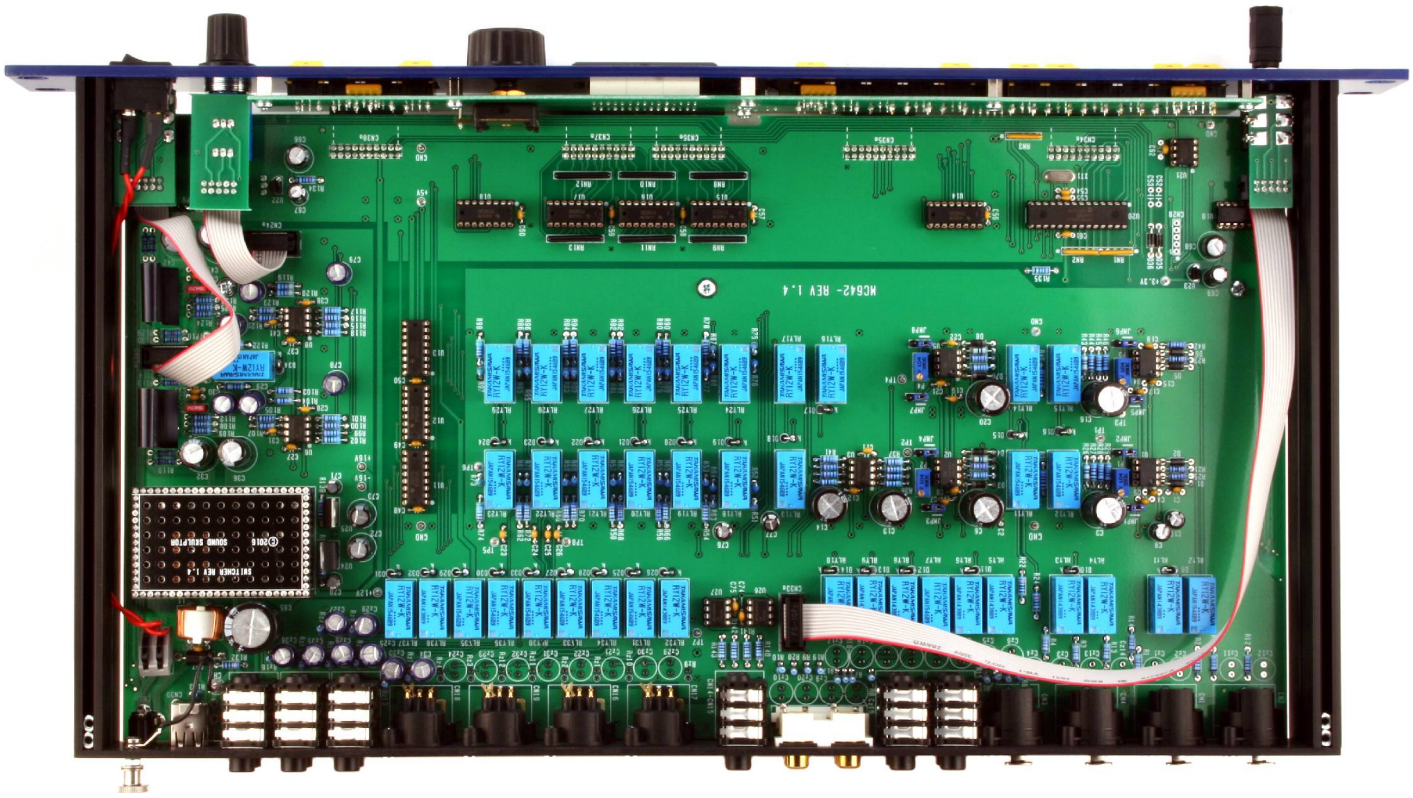
15. Power module

Insert the Switcher-2 power module into the sockets.

MC624 Assembly guide – Final assembly

16. Knobs & jack

Attach the knobs. The large knob, for level encoder, needs a 10mm socket wrench for tightening.
Shorten the headphone potentiometer shaft by 5mm using large cutting pliers.
Insert the nut cover into the smaller knob and attach it to the headphone potentiometer.
Insert the 3.5mm jack adapter into the input 6 jack.



17. Testing

Follow the testing guide: m624-setup-guide document

18. Top and bottom

The top and bottom covers have a 5mm front fold that must be placed against the front panel.
With the help of the panel, adjust the position oft the 2 nuts on both sides in order to make them face the panel holes. Then screw the panel in place with 4 M3x6 black countersunk screws.

Stick four self adhesive rubber feet to the bottom of the case.

19. Congratulations !

You're done !