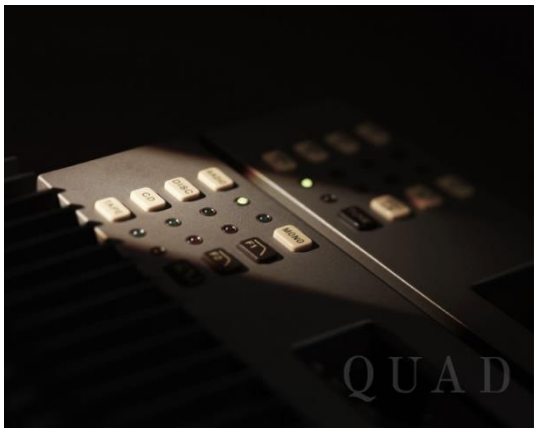
Quad 34 DIY illustrated guidelines version 3.5

These are the illustrated step-by-step guidelines for upgrading your Quad 34 with the Dada Electronics upgrade-kit.



The Quad 34 is a very good preamplifier, but after a number of years the electrolytic capacitors tend to dry out and need replacement. Also the outdated opamps are replaced with modern up to date devices. We will replace all electrolytic/tantalum capacitors, and the Opamps.

Although there are three major releases of the circuit, from a replacement point of view, we can cover all the models with two kits. One kit for serial number 1 to 8000 and another kit for serial number 8000 and onwards.

We will give you some information about changing the output level of the 34, i.e. if you want the preamp to drive a Quad II tube amplifier or others with lower sensitivity.

Also some capacitors (C16 and C17) are not correct placed, we will address this issue.

We will do the upgrade step-by-step. For every step these guidelines will tell you what to do (in Underline) and give you some tips, tricks and advice (in Italics). You should have some soldering-experience for bringing this project to a good end but you don't have to be an electronics-expert.
Download the Service Manual from our Website. This will give you an idea about general construction and the diagrams. The information from the Service manual is not repeated in this manual. If you plan the upgrade at a later date, also store the upgrade manual with it, we don't keep older versions online.

When there are any problems, send an e-mail to info@dadaelectronics.eu with a good description of the problem. Some pictures may help us understand the problem better. When the project is a success you will be listening to one of the best high-end pre amplifiers ever made with a better-than-original Quad-sound. Components may change without notice.

Stefaan & Joost –December 2016

Step 1 – The tools & the Components

The tools you need:

- A good quality soldering iron with a fine point (max 30) Watt or a soldering-station.
- A good desoldering-pump or desoldering-station
- A micro cutting nipper, a wire-stripper and a miniature pliers
- A Philips n° 2 an 1 screwdriver
- Tin/lead solder wire
- A digital multimeter
- Kontakt LR PCB-cleaner and Kontakt 61 Contact-spray are very useful

If you don't have these tools you can order them in the Dada Electronics webshop.

The components in the 34 upgrade-kit:

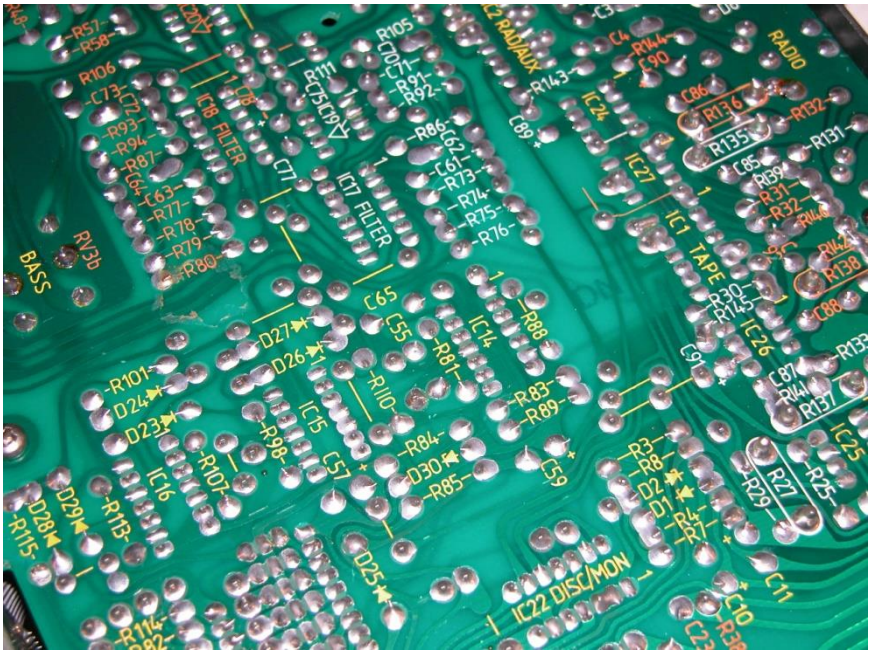
Components to be mounted on the motherboard (in both channels):

	Serial number 0-8000	
IC	Number in diagram	Quantity
LME49710 or OPA604	Ic 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 19, 20	12
Capacitor	Value and number in diagram	
100uF	C 10, 11, 16, 17, 57, 59, 69, 77, 78	9
22uF	C 58	1
1000uF	C 74	1
2.2uF	C 18, 22	2
Wire link	C 30, 31, 48, 54	4
	Serial number 8000 and onwards	
IC	Number in diagram	
LME49710 or OPA604	Ic 7, 8, 9, 10, 12, 13, 19, 20	8
LME49720 or OPA2604	Ic 24, 25, 26, 27	4
Capacitor	Value	
100uF	C 10, 11, 16, 17, 57, 59, 69, 77, 78	9
22uF	C 58, 84	2
1000uF	C 74	1
2.2uF	C 18, 22	2
Wire link	C 30, 31, 48, 54, 89, 90, 91, 92	8
Decouple cap	100nF for decoupling the Op Amps, see page 7	4

All other Quad 34 electronic components are also available from *the Dada Electronics webshop,* see also *the Quad Spot weblog*.

Step 2 – Dismantling the 34

Working on the 34 is simple. All components are soldered directly to the motherboard. Remove the lid of the power supply compartment and the protective plastic plate at the underside of the motherboard.



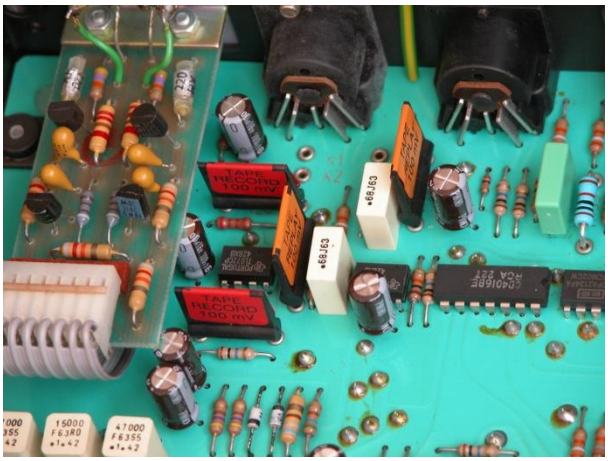
On the back of the boards the component-numbers for the left channel are printed in white, for the right-channel in yellow. The schematic for both channels is identical but not the object-location. If you are not sure about the positions of the components, make pictures of the unit or a drawing before you remove any component.

The best way to proceed is to remove all components to be replaced (see the list above) in one channel and then in the other channel. After removing the components you can clean the board with Contact LR cleaner. Make sure all unnecessary solder and raisin rests are removed.

The circuit board is dual layer, so use a good desoldering-pump or desoldering-station. Don’t apply to much heat or force. If you don’t need to reuse (not advisable) the old components, clip them with small pliers on the component side and remove the remains with the desoldering-pump or station, this is much easier and gives a lower risk of damaging the tracks on the board.

Step 3 – Fitting the components to the board

Solder all the components to the board. Double check also the position of the opamps, on the copper side there is a dot or a 1 to mark pin 1, like on the opamp-chip.



Check also the positions of the Elko's. C 30, 31, 48, 54 and C 89, 90, 91, 92 are replaced by a wire link. The plus and minus symbols on the Pcb are not always correct or missing. Put the wire link from the component side in the Pcb, in this way it is clear from the component side which component is replaced by a link.

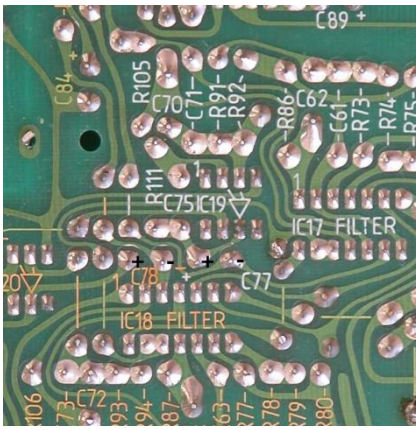
Capacitor	Placement	Correction
C10	Ok	
C11	Ok	
C16	Reverse	See Pictures for both kits
C17	Reverse	See Pictures for both kits
C18	Ok	
C22	Ok	
C30	Replace by link	
C31	Replace by link	
C48	Replace by link	
C54	Replace by link	
C57	Ok	
C58	Ok	
C59	Ok	
C69	Ok	
C74	Ok	
C77	Ok	See Picture for all kits
C78	Ok	See Picture for all kits
C84	Ok	
C89	Replace by link	
C90	Replace by link	
C91	Replace by link	
C92	Replace by link	

Position of C16 and C17 in models prior to serial number 8000

Picture courtesy of Keith Snook

Position of C16 and C17 in models above serial number 8000

Position of C77 and C78 all models



Step 4 - Changing the output level (optional)

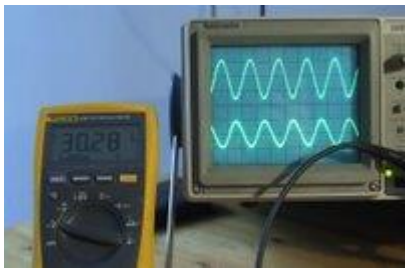
The standard level is 500mV RMS

Changing Output Level Chart				
To **reduce** the output connect additional resistors in parallel with R119/122 as follows:	470Ω for 9 dB attenuation (180 mV) 180Ω for 15 dB attenuation (90 mV) 100Ω for 20 dB attenuation (50 mV)			
To **increase** the output change resistors as follows:	output (rms)	1V6	1V1	775 mV
	R118/121	shorted	1kΩ	1k5Ω
	R119/122	3k3Ω	2k2Ω	1k5Ω

Step 5 - Testing the amplifier

If you have a scope and a sinus-generator you can measure the output voltage and the input-sensitivity of the amplifier.

If you don't have this equipment it's not a problem. There are no necessary calibrations to be done.



Step 6 – Re-assembly

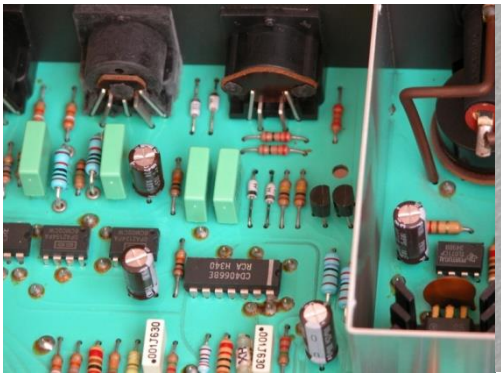
Re-assembling the 34 is simply a matter of reinstall the protective plate and the lid on the PS compartment and putting it in its case…

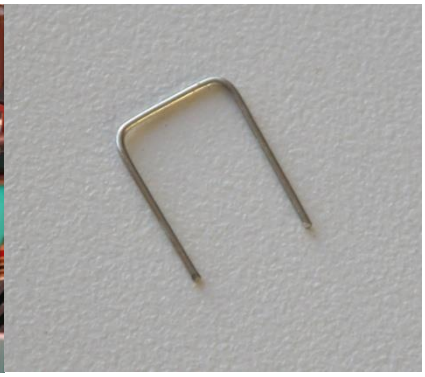
And that's it.

If there is any problem don't hesitate to send me an e-mail (info@dadaelectronics.eu). A picture and a good description will help to solve the problem.

Stefaan & Joost

Notes and extra information.

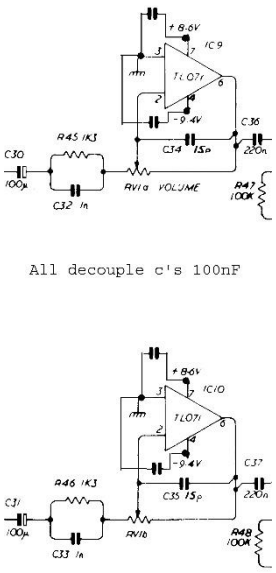




Example of a wire link

Decoupling of the Op Amps.

In some cases a low frequency oscilation occurs, this is due to the long Pcb tracks from the powersuply to the Op Amps.
Use a small film caps between pin 3 and 7, and between pin 3 and 4, of Ic 9 and 10, as in the following diagram, two 100nF low voltage ceramic or film capacitors per Op Amp will do.

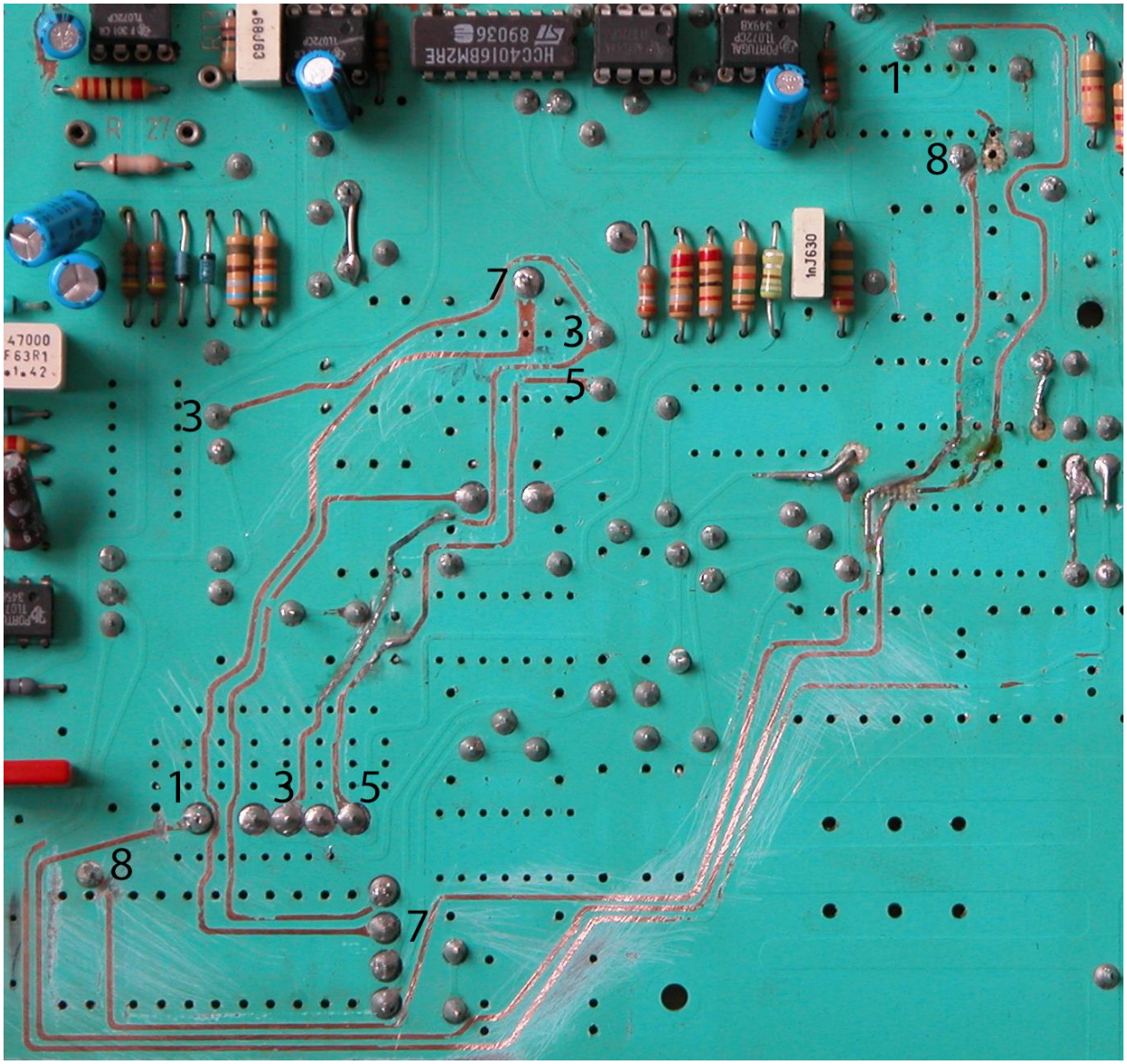


The most convient place for these capacitors is around Ic 9 and Ic 10, because pin 3 of the op Amps is allready connected to mass (ground), solder the capacitors at the copper side.

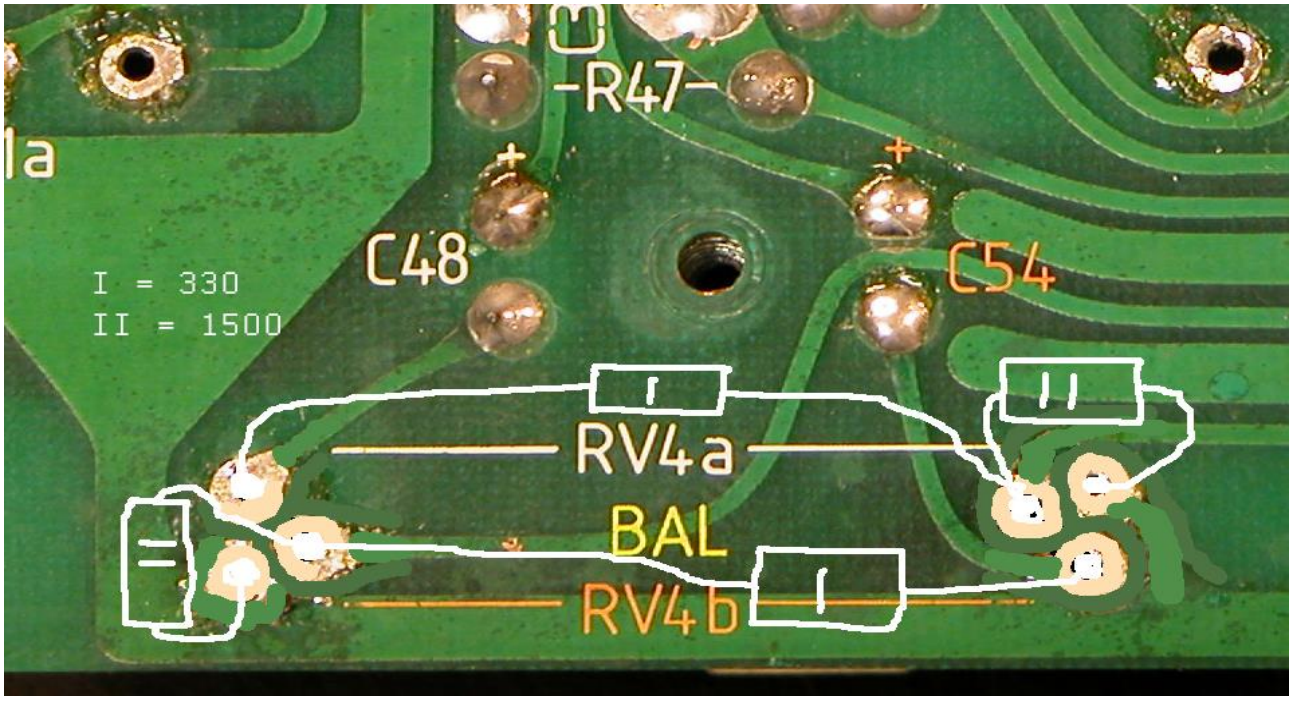
Example of decoupling Ic 10

Erratic switching

Due to leakage of the coupling elco's, sometimes the tracks underneath the elco's, or nearby, got 'eaten' by the acid mixture, also the capillary cavity formed by the layer of paint on the Pcb, doesn't help. Although the lethal (electronically spoken) mixture could also be in other places on the circuit board, the most annoying effect is the suddenly changing of input channels or mixing the inputs. The picture shows a board in bad shape, but by connecting the 'pins' with insulated wire, the bad tracks are bypassed. Just connect number one with the other number one, number 3 with the other two number 3 and so on. If the elco's in other places leaked and damaged the tracks, the same recipe should be followed, but the damaging in other places is rare.

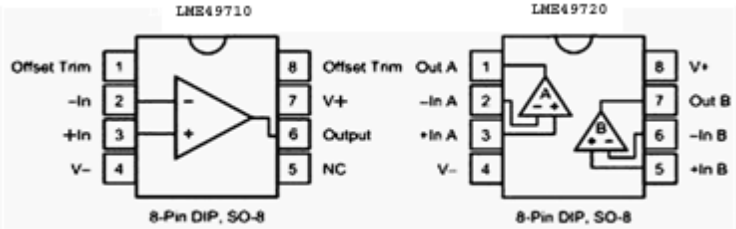


Replacement of defect Balance control



You can replace the balance control with fixed resistors. RI is 330 ohm and RII is 1500 ohm. In this way you preserve the original volume setting. At the cost of some extra volume, you can replace RI with a wire link and do not place RII.
Original Balance potmeters are not available anymore, in some cases the pot can be repaired, but it will be labor intensive and hence expensive.

Pin layout LME49710 and 720, top view! (Component side)



These diagrams explain the pin numbering, the notch in the casing indicates the position of pin 1 and 8 (or there is a dot in the form of a well in the case near pin 1). The OPA range has the same layout.

Possible adjustments for the Phono MM module.

In our kit we only replace the standard worn out or outdated components, but in some cases the MM module sounds lifeless comparing to the other inputs. A possible cure for this is the replacement of C1b and C2b on the MM module. The value is 220pF which combined with the capacity of the Turntable Pick Arm cabling could be too high for modern MM cartridges. Reducing the value to 47pF will increase the high frequency output of the cartridge.

A very good one is:

http://www.dadaelectronics.eu/shop/components/capacitors/silvered-mica-capacitors/47pf-500v-sm-cornell-dubilier

A more affordable one:

http://www.dadaelectronics.eu/shop/components/capacitors/ceramic-capacitors/47pf-100v-vishay

If slightly more bass output is needed, increase C18 and C22 to 3.3uF.

http://www.dadaelectronics.eu/shop/components/capacitors/electrolyte-capacitors/3-3f-100v-radial-bc-components

Some words about capacitor polarization.

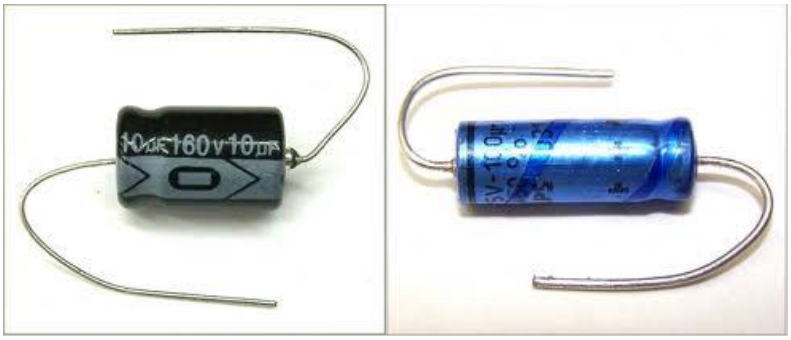
With modern OpAmps it is almost impossible to polarize the electrolyte capacitors. The DC offset at the output of OpAmps is very low and unpredictable concerning the polarity. That's why we advise to shorten the caps in a revised pre amplifier. The only awkward place to do this is the output section and the tape output. Because you never know the kind of equipment connected to the outputs, leave the caps in place. So in most cases two output capacitors have to be used. After years of experience and selling kits, we decided that the best way to install those capacitors is with the negative connection towards the output connector. As you will see in diagrams of the updated Service manual V1.0.

The indentification of the plus and minus of electrolyte capacitors.

In allmost all cases the minus is indicated with a long stripe with symbols at the side of the can in the color of the printed text.

Also if the capacitor has wires, the minus wire is the shortest one!

Capacitors with srcew terminals will have sometimes the stripe indication or have indications on top of the capacitor, if any doubts, contact us! Connecting capacitors in the wrong way could give a lot of damage.



With axial capacitors there is an extra arrow indicating the minus wire, or there is a printed small ring around the body indicating the minus wire. Also the minus wire is direct connected to the aluminium body. The plus wire is sticking through the black plastic cap.

Indication of the cathode of diodes and zener diodes

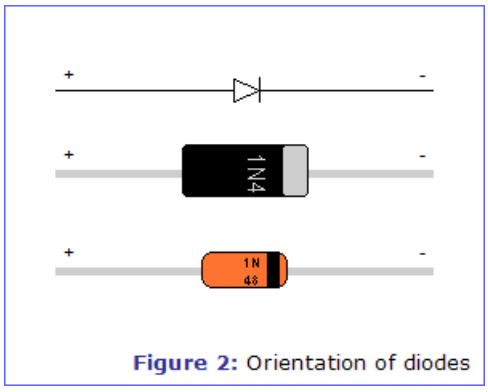


Figure 2: Orientation of diodes

The cathode will be indicated by a white, silver or black line on the body of the diode.

Color coding of resistors.

To distinguish left from right there is a larger gap between the D and E bands.

- band **A** is the first significant figure of component value (left side)
- band **B** is the second significant figure
- band **C** is the third significant figure
- band **D** is the decimal multiplier
- band **E** indicates tolerance of value in percent

Color	**A** First figure	**B** Second figure	**C** Third figure	**D** Multiplier		**E** Tolerance
Black	0	0	0	×1		–
Brown	1	1	1	×10		±1%
Red	2	2	2	×100		±2%
Orange	3	3	3	×1K		–
Yellow	4	4	4	×10K		–
Green	5	5	5	×100K		±0.5%
Blue	6	6	6	×1M		±0.25%
Violet	7	7	7	×10M		±0.1%
Gray	8	8	8	×100M		±0.05%
White	9	9	9	×1G		–
Gold	–	–	–	×0.1		±5%
Silver	–	–	–	×0.01		±10%
None	–	–	–	–		±20%

Example: Red, Red, Black, Red, Brown
220 X 100 = 22Kohm and 1% tolerance

If the resistor has 4 bands, leave out colum C