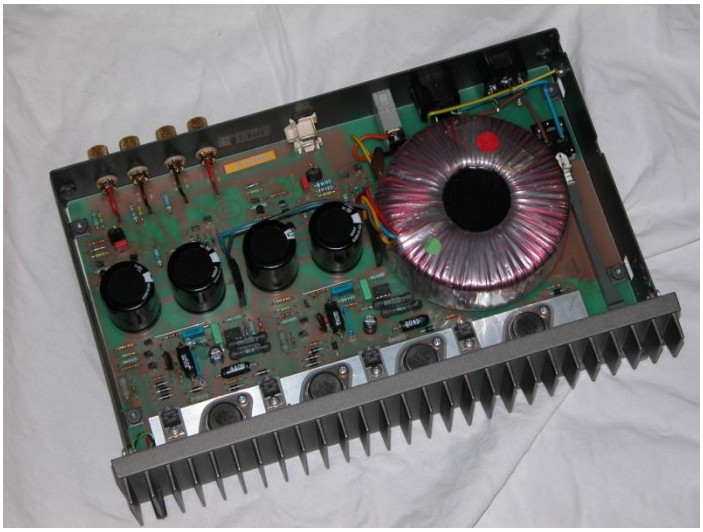
Quad 306 DIY illustrated guidelines version 1.4

These are the illustrated step-by-step guidelines for upgrading your Quad 306 with the Dada Electronics upgrade-kit.



We will replace all electrolytic capacitors, the output connectors, some resistors and capacitors in the input- and DC feedback circuit like Quad did in the 606 MKII, 707 and 909. Some signal capacitors are replaced by high quality capacitors.
We will also adapt the input-sensitivity (as an option) by increasing the local feedback in the input-circuit. This further increases the signal-to-noise ratio reduces distortion and makes the amplifier better adapted to modern sources.The standard 306 has a very high input sensitivity, this was done to match it with a 606 in a 'horizontal' Bi-Amp configuration.
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.
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 to understand the problem better. We will do our best to answer within 24 hours 7/7. When the project is a success you will be listening to one of the best high-end current-dumping amplifiers ever made with a better-than-original Quad-sound. Always Download the service manual for additional information from our website. Information from the service manual will not be repeated in this manual.
Components may change without notice. If you plan the upgrade in the future, store the corresponding upgrade and service manual with the kit. We don't keep the older versions of the manuals on-line!

Stefaan & Joost November 2015

www.dadaelectronics.eu

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 desoldering-pump or desoldering station
- A micro cutting nipper, a wire-stripper and a miniature plier
- A Philips n° 2 screwdriver and a small flat 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 306 upgrade-kit:

Cables, connectors & mechanical components:

- 2 x Gold-plated LS-connectors with red markings
- 2 x Gold-plated LS-connectors with black markings
- 2 x 10 cm flexible 0,75mm² Hi-Q cable for internal wiring of the LS-connectors (Black + Red).

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

- 2 x R 62K 1% for R6 (blue-red-black-red-brown)
- 2 x R 18R 1% for R13b (brown-grey-black-gold-brown) (*)
- 2 x R 27R 1% for R13c (red-violet-black-gold-brown) (*)
- 2 x C 330nF MKT for C2
- 2 x C 1µF MKT for C3
- 10 x C 100nF MKT (Decouple[1] caps for the zener's D1 to D4 and C7)
- 6 x C 330pF polystyrene for C1, C5, and C6
- 2 x C 180pF polystyrene for C4
- 2 x C 47pF polystyrene for C8
- 4 x C 6800µF or 4700uF, 50V or 63V for C10 and C11
- 2 x C 100µF 63V for C7

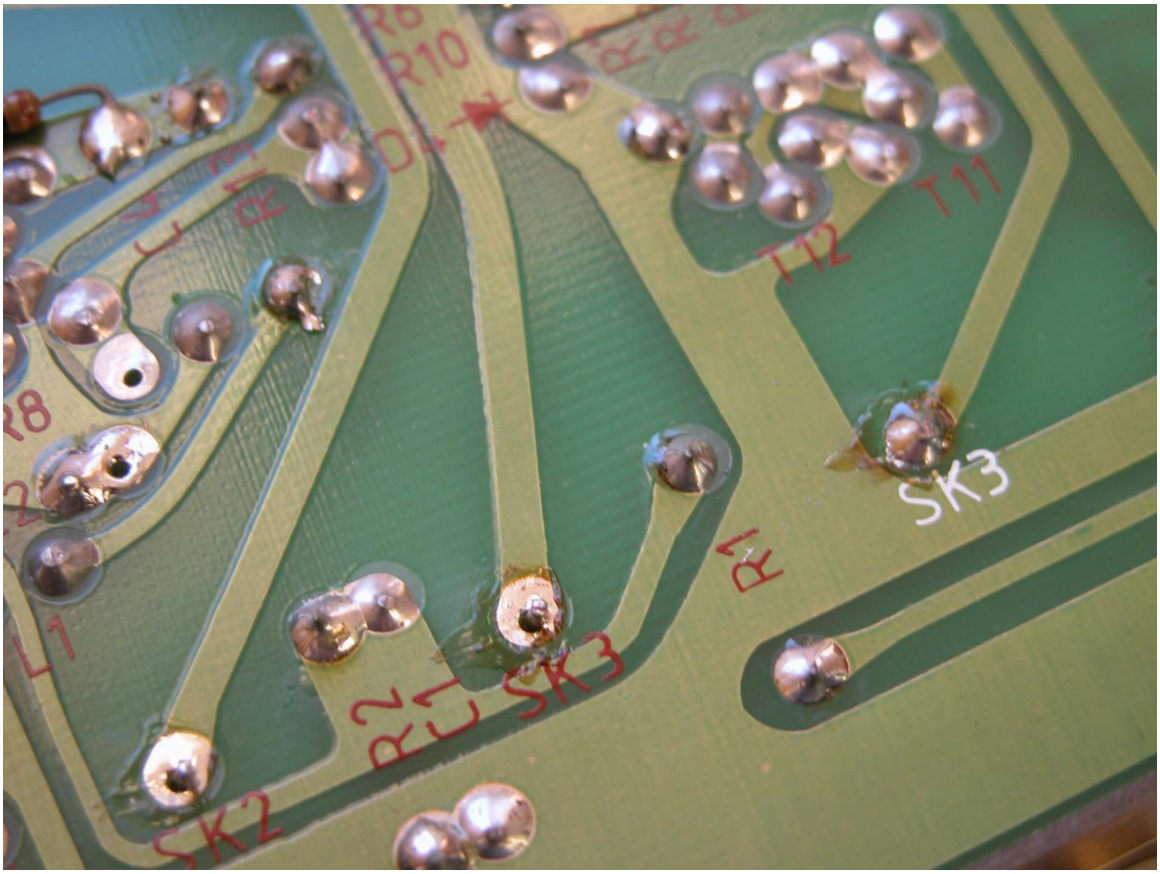
(*) Only needed if you want to change the input sensitivity!

All other Quad 306 electronic components are also available from *the Dada Electronics webshop*.

[1] Decoupling, not for replacement, decoupling caps are placed at the copperside!

Step 2 – Dismantling the 306

Working on the 306 is simple. All components except the loudspeaker-connectors are soldered directly to the motherboard. The LS-connectors are connected with a small piece of wire.



On the back of the boards the component-numbers for the left channel are printed in white, for the right-channel in red. The schematic for both channels is identical but not the object-location.

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 Kontakt LR cleaner. Make sure all unnecessary solder and raisin rests are removed.

Step 3 – Fitting the components to the board

Solder all the components to the board. Double check everything.

Old en new!

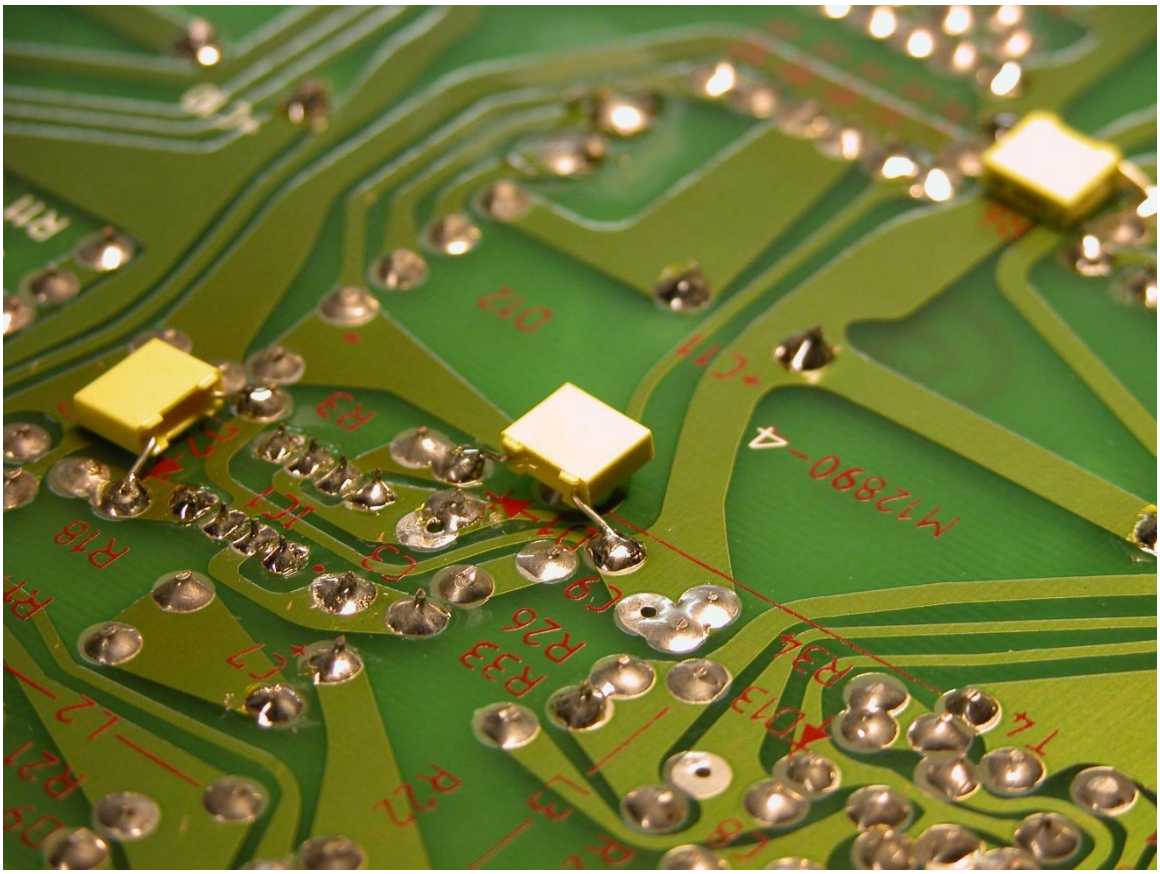
The standard input-sensitivity is **0.375 Volt**. If you want to change it to **0.775 Volt** replace R13 with 18R – if you want to change it to **1.0 Volt** (Line-voltage) replace it with 27R. The alternative resistors are included in the kit.

If you are using the 306 with a 33, 34, 44 or 66 preamplifier you might not prefer to change the sensitivity. But in most cases the 0.775V or 1.0V setting makes the volume pot range on Quad pre amps more usable. For other preamplifiers you would prefer the 1.0 Volt sensitivity. Of course you can always change it afterwards.

Install the Loudspeaker-posts. The holes have the correct size so you won't need to drill. Connect the posts to the board with a piece of wire.

Attention: the order is Red – Black – Black – Red.

Solder the small 100 nF decoupling caps over the zener-diodes D1 to D4 and C7 on the copper side of the board. **Leave the zeners and capacitor in place**!



Mount the snap-in 6.800 µF Power-supply capacitors. Check and double-check the polarity.

If the polarity is wrong they will explode!!!

The + side is indicated op the PC Board. The white or gold band on the capacitors is the – side.

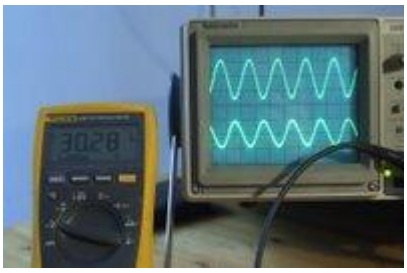
You may consider cleaning the RCA-contacts with Kontakt 61 anti-corrosive contact-spray.

Step 4 - Testing the amplifier

If you have a scope and a sinus-generator you can measure the power 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 as it is a Current-dumping design.

If you have a multimeter you could check the power-supply rails (+ 40 V and – 38V) and the DC-component in the output (< 0.01 V).



Following measurements are OK:

- 0.01 or less Volt DC on the outputs
- Around 20 Volt AC on the outputs just before clipping. This corresponds with 50 Watt into 8 Ohm. One channel driven, 240 VAC power supply voltage. If the measurements take more than 10 to 20 seconds on full power, the trip protection comes in, this is normal. Switch the amp off, and reset the trip protection.
- The AC voltage you selected with R13 on the input before clipping.

Step 5 – Re-assembly

Re-assembling the 306 is simply a matter of putting it in its case…

And that's it.

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

Stefaan & Joost

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

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

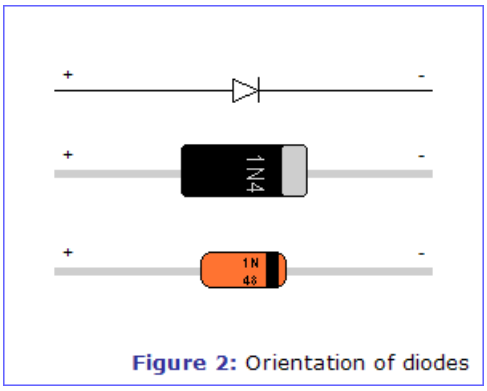


Figure 2: Orientation of diodes

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