Upgrade/revision manual Quad 44 pre amplifier. V2.6

These are the illustrated step-by-step guidelines for upgrading your Quad 44 with the Dada Electronics upgrade-kits.

The Quad 44 preamp was the first Quad preamplifier using op-amps and electronic switches. The input circuits where built as separate modules, allowing for more versatility. The input modules are interchangeable, so you could equip the unit with 5 pickup inputs or any other combination.

From a technical design viewpoint the unit was the successor of the Quad 33; it has the same internal bus voltage of 100mV, DIN sockets in the first models and the 33 filter section. A lot can be said about the quality of the circuit design and the design parameters, but remember, this is from today's perspective!

With the implementation of the Dada kits, the 44 will perform as it was intended by Quad and even better as we will use the latest in Opamp and switching technology as well as better passive components.

The 44 was produced from 1979 till 1989, 40000 units were built. Although there are a lot of internal versions, if you look at the outside only, there are two models, the first brown series and the later grey series.

From serial number 23000 onwards, the tone and volume control circuits were "copied" from the Quad 34 preamp, which was introduced after the 44. Also, dual opamps were used in the CD/AUX-module.

Although there are major internal circuit releases, three kits can cover these models with the standard input modules. For the non standard modules, in most cases the MC modules in a total of seven variations, ask us for a separate kit. Based on the serial number and the module PCB numbers DaDa Electronics can supply the correct parts. Contact info@dadaelectronics.eu for special versions of the kit or specific components.

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 conclusion, but you don't have to be an electronics expert.

If there are any problems, send an e-mail to info@dadaelectronics.eu with a clear description of the problem. Some pictures may help us understand the problem better. We will do our best to answer within 24 hours 7 days a week. When the project is completed, 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.

For diagrams and other useful information: download the service manual.

Stefaan & Joost, June 2019

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 miniature pliers
- Philips n° 2 and 1 screwdrivers
- Tin/lead solder wire
- A digital multimeter
- Kontakt 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 web shop.

The components in the Quad 44-kit:

During the revision we will replace all electrolytic capacitors as well as the (single and dual) opamps and the electronic switches.

Depending on the serial-number you will use kit I, II or kit III.
To avoid switch oscillation and malfunction we will add a 4µ7 axial capacitor to the PSU board: see the Quad paper on this subject on page 5 of this manual.

	Serial number 0-12000 - Kit I	**Replace with:**
Tonecontrol: M 12512 iss 8	4 x TL 071 2 x 100uF 6.3V C522/523 1 x 47uF 40V C528	OPA604 or LME49710 100µF 10V 47µF 63V
Mother/PSUboard M 12436 iss 4 See page 7	2 x 47uF 63V C402/403 2 x 1000uF axial C404/405 4u7 63 volt on PSU board extra 4 x 4066 R400, R405 R402, R403	47µF 63V 1000µF 25V Axial or Radial 4,7µF 63V Axial CDC4066BNC 1Ohm 1500 Ohm
Tape board 2 x M12496 iss 3	4 x TL071 4 x 100uF 6.3V C3/4	OPA604 or LME49710 100µF 10V
Disc board M 12515 iss 5	2 x TL071 2 x 2.2uF 50V C316/317	OPA604 or LME49710 2,2µF 50V
Radio board M 12511 iss 1	4 x TL071(2 x Radio board)	OPA604 or LME49710

	Serial number 12000 - 23000 - Kit II	Replace with:
Tonecontrol board: M 12512 iss 9	4 x TL 071 2 x 100uF 6.3V C522/523	OPA604 or LME49710 100µF 10V
Mother /PSUboard: M 12436 iss 5 See page 7	2 x 47uF 63V C402/403 2 x 1000uF axial C404/405 1x 100uF 16V C407 4u7 63 Volt on PSU board extra 4 x 4066 R400, R405 R402, R403	47µF 63V 1000µF 25V Axial 100µF 16V 4,7µF 63V Axial CDC4066BNC 1Ohm 1500 Ohm
Tape board 2 x M12496 iss 3	4 x TL071 4 x 100uF 6.3V C3/4	OPA604 or LME49710 100µF 10V
Disc board M 12515 iss 5	2 x TL071 2 x 2.2uF 50V C316/317	OPA604 or LME49710 2,2µF 50V
Radio board M 12511 iss 1	2 x TL071	OPA604 or LME49710
AUX board M 12511 iss 2	2 x TL071	OPA604 or LME49710

	Serial number 23000 & Higher - Kit III	Replace with:
Tonecontrol board: M 12784 iss 1	5 x TL 072 6 x 100uF 6.3V C702/703/706/707/731/735	OPA2604 or LME49720 100µF 10V
Mother/PSU board: See page 7	2 x 47uF 63V C402/403 2 x 1000uF axial C404/405 100uF 16V C407 4u7 63 volt on PSU board extra 4 x 4066 R400, R405 R402, R403	47µF 63V 1000µF 25V Axial 100µF 16V 4,7µF 63V Axial CDC4066BNC 1Ohm 1500 Ohm
Tape board 2 x M 12496 iss 3	4 x TL071 4 x 100uF 6.3V C3/4	OPA604 or LME49710 100µF 10V
Disc board M 12515 iss 5	2 x TL071 2 x 2.2uF 50V C316/317	OPA604 or LME49710 2,2µF 50V
Radio board M 12511 iss 2	2 x TL071	OPA604 or LME49710
CD/AUX board M 12815 iss 1	1 x TL072	OPA2604 or LME49720

All other Quad 44 components are also available from *the Dada Electronics webshop*

Dismantling the 44 and replacing the components

Remove the cover. Remove the input modules. Remove the white plastic locator and the protective cardboard from the module rack.

If you want easy access to the motherboard to which the input modules mate, remove it from the unit.

You don't need to remove the tone-control board: you can solder the components while the board remains in place.

Replace the electrolytic capacitors one by one. On the circuit boards there is in most cases no plus or minus indication, so make notes or pictures. The same applies to the op-amps and the switches: note where pin 1 was before you remove each op-amp, and fit the new op-amp the same way. You may indicate the + side of the electrolytic and the pin 1 location of the op-amps on the board with a pencil.

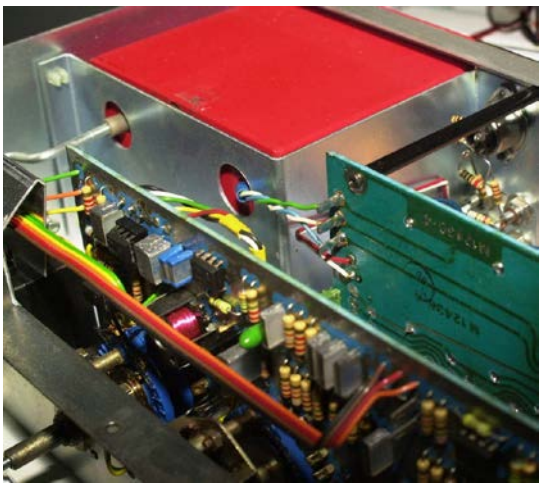
There is an extra 4.7µF Axial electrolytic supplied in the kit. This is an official modification from Quad to prevent erratic switching, see the picture and the Quad paper for correct placement on the PSU board.

On 44 above serial number 23.000 it can be difficult to replace Ic701. Remove the front and the plastic on/off switch rod.

Testing the amplifier

If you have a scope and a sine wave-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.

No calibration is necessary.



And that's it.

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

Stefaan & Joost

QUAD

Technical Information

No: 003 issue 2

Date: 23.05.90

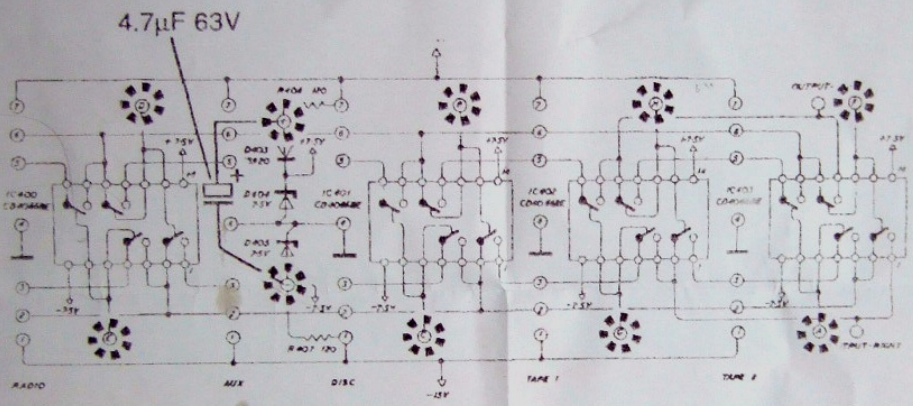
Ref: M12436-5

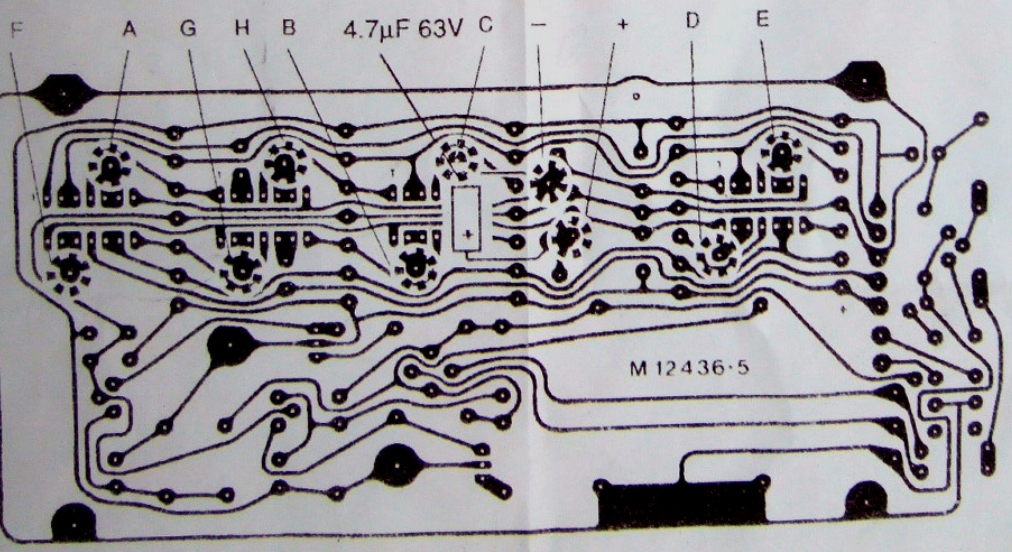
QUAD 44 ERRATIC INPUT SWITCHING

A small number of 44 control units appear to be subject to pulses, triggering the electronic switching causing the unit to change from the input selected either to another input or to no input at all. The required input can then be regained by pressing the appropriate input selector button. The cure is to:

1. Resolder both sides of the 10 feed through pins marked D, E, +, -, B, C, H, G, F and A on the mother board. Ideally the pins should be replaced with tinned copper wire. These are ringed in the diagrams below.

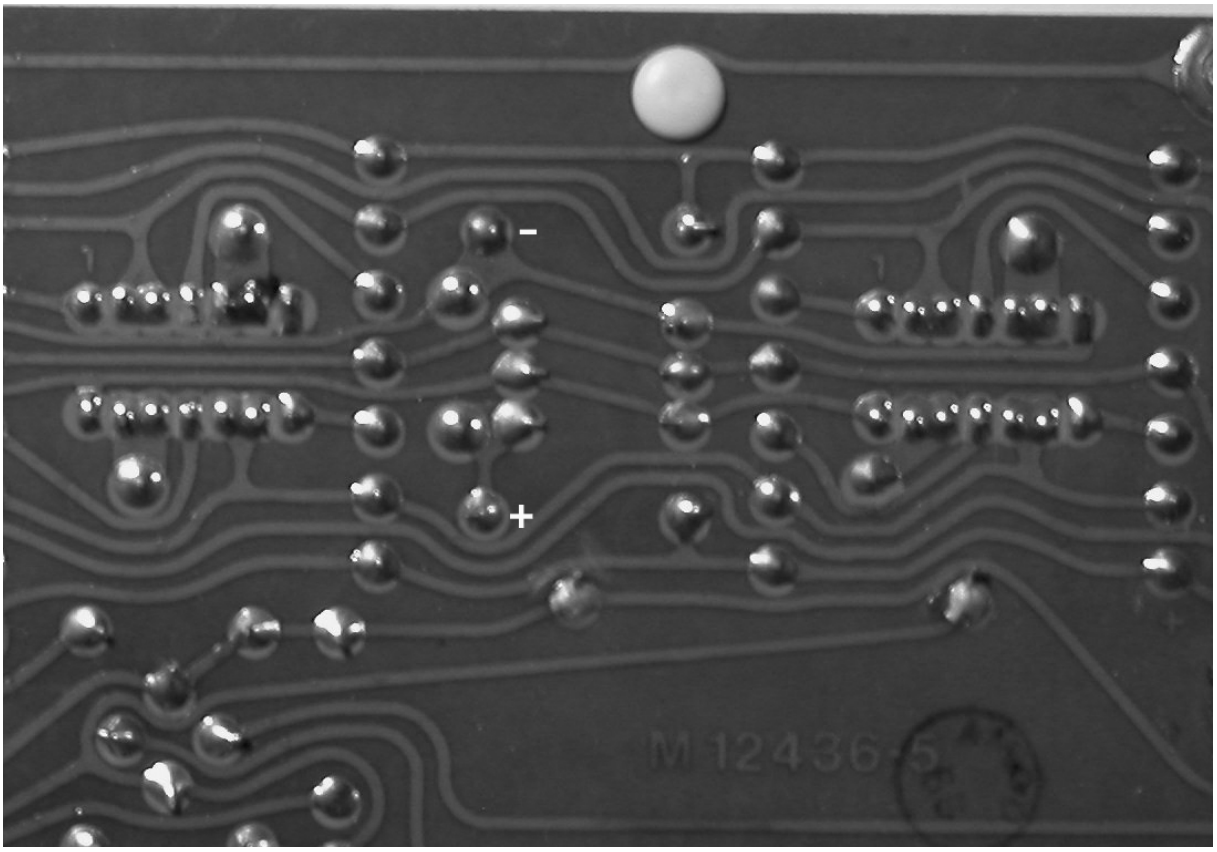
2. Connect a capacitor min 4.7 µF (C4U70ZA) across the +8.5V and -7.5V rails on the back of the mother board, as shown below.





Quad Electroacoustics Ltd Huntingdon PE18 7DB United Kingdom
Telephone: 0480 52561 Telex: 32348 QUAD G Fax: 413403

Placement of 4u7 capacitor on the motherboard



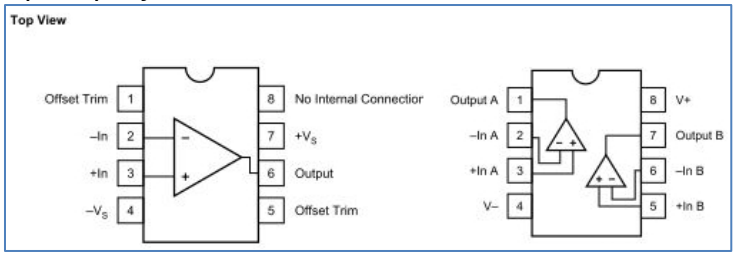
Extra information on further upgrading and fault situations.

Tone control board
On some Model I units, prior to serial 2401, users find it annoying that the unit is not ‘silent’ at volume position zero, like the 34 pre amp.
Change R500 and R501 from 22k to 6k8, change R502 and R503 from 6k8 to 2k2 on the tone control board. The output of the 44 is now at a -72dB level at position zero, not silent, but close!

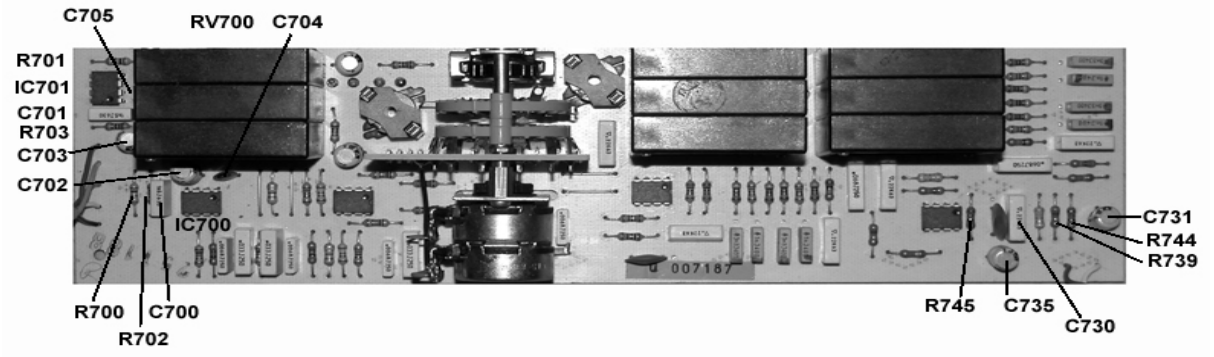
Power supply board
In some cases the PSU is not delivering enough current to feed all the Op amps and the relay circuit, with a rattling relay at start up as the consequence.
Replace R400 and R405 with 1 Ohm, R402 and R403 with 1500 Ohm. The resistors are in the kit, but only necessary when the ‘rattling’ occurs.

Low frequency oscillation.
In some cases the modern Op Amps oscillate due to long power supply tracks and/or wiring. Placing a small capacitor between the plus and ground, and the minus and ground can solve this oscillation, the best place to this is at Ic500 and Ic501. Connect a small 100nF capacitor between pin 3 and 7, and 3 and 4. For 44’s above serial 23.000: The Ic number is Ic700a and Ic701a. The capacitors must be placed between pin 3 and 4, and between pin 3 and 8 because these are dual Op Amps.

Op Amp layout



Layout of tone control board above serial 23000



The next section gives information on further upgrades, beyond the standard kit.

Radio Input board M12511 iss 1 and 2
Remove R204 and R205, and replace R202 and R203 with a wirelink.

Aux Input board M12511 iss 2
Remove R606 and R607, and replace R604 and R605 with a wirelink.

Quad did design the circuits like they are, because of Op Amps that could not cope with unity gain, with the replacement Op Amps; this is not a problem anymore. The modification reduces noise and distortion by increasing the local feedback.

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

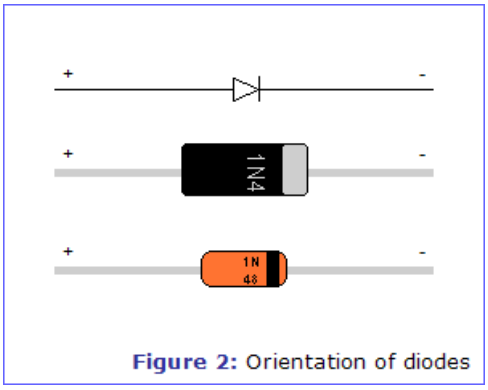


Figure 2: Orientation of diodes

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