Dada Electronics - Quad 33 Revision - Illustrated Guidelines – V 2.7

First of all, thanks for your purchase of our upgrade kit! Hereunder you will find the step-by-step guidelines for upgrading the Quad 33 amplifier to modern, high-end standards. All resistors are metal film low-noise 1% 0,5W; all capacitors are audio-grade (except for the power-supply ones) and 10 Volt or more. All transistors will be replaced with low noise equivalents. A word of advice: be sure to always watch the polarity of all diodes, zeners & electrolytic capacitors mentioned, and strictly follow the steps described in these guidelines!
In general, a higher voltage rating for the components will not cause a problem; sometimes, capacitors with a higher voltage rating are delivered, depending on availability.

A warning about soldering and de-soldering: the circuit tracks, being very old and predating modern PCBs, may involuntarily lift when removing components, so additional care should be taken. Do not (!) apply too much heat. Use a desoldering pump or -station. Always use leaded solder and use eye protection when soldering!

Be sure to always take *appropriate safety measures* when performing the upgrades mentioned.

You can obtain 7/7 technical support for upgrading the 33 via this e-mail address.
Also, make sure to check the Quad revision weblog regularly.
The diagrams and the service manual can be downloaded from our website; details will not be repeated in these guidelines. Please refer to our download section.
The Quad 33 revision kit (with selected components) is available from the Dada Electronics webshop.

Stefaan and Joost, December 2018

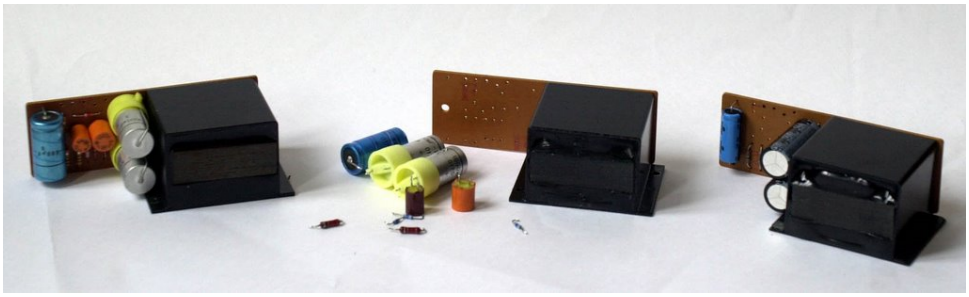
Components in our kits may change without notice; the values mentioned in this manual are merely minimal specifications. Please be advised: make sure to always download the latest manual. If you are planning to upgrade somewhere in the future, be aware to store the corresponding upgrade manual together with the kit, Dada Electronics will not store older versions of any upgrade manual online.

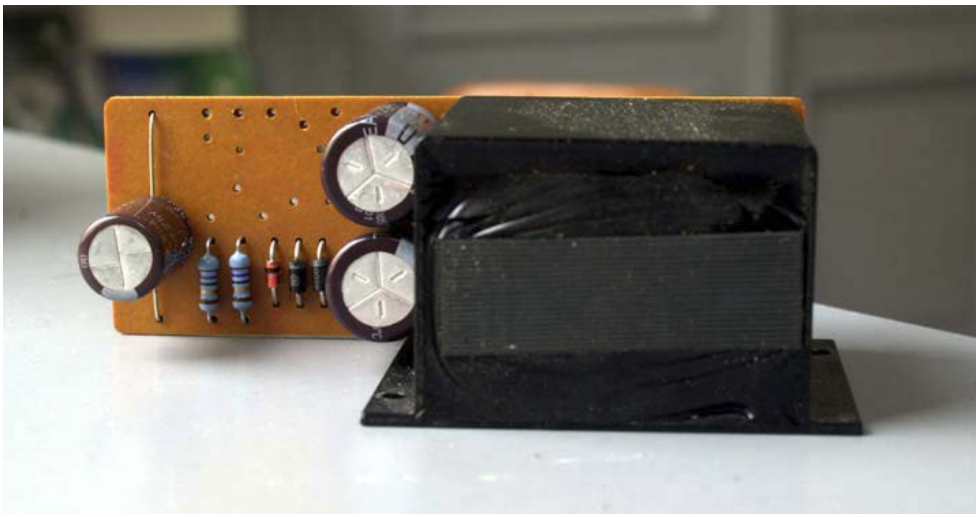
Step 1 - Modifying the power-supply from 12 to 16 Volts

Increasing the power-supply voltage to 16V increases the ''headroom'' and reduces distortion.
Also, the low-voltage switching signal at pin 4 of the output socket (which was intended for switching on the power-amp remotely) is disabled. This feature has never been implemented for the Quad power-amps. Also, this has been omitted by Quad in later versions of the 33. For this purpose, C503, C504, MR503 and R502 will be removed as well.

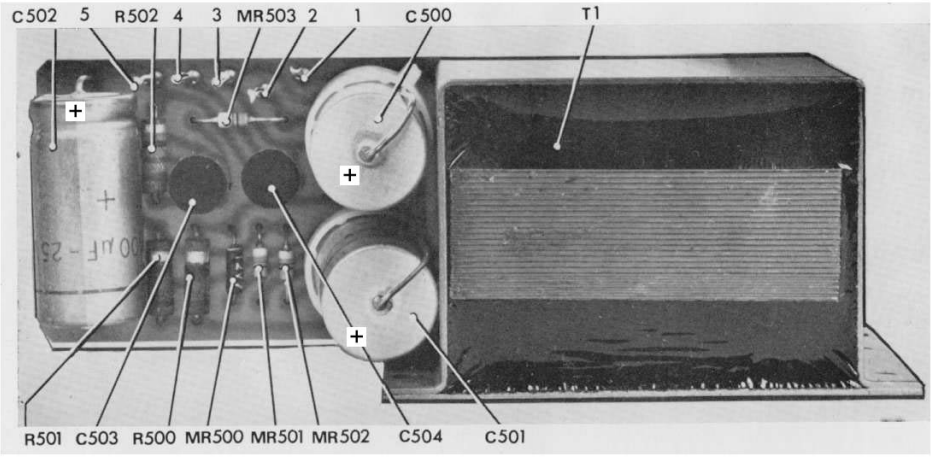
Some earlier boards have PCB connectors, the wires are not connected directly to the board as was the case in later versions. Please be advised to *not* remove those pins.
Desolder the wire-beam and the mains connections located on the power-supply board. Be sure to remove the power-supply board (2 screws). Also, remove all components - except for the transformer - from the board.

- Replace R500 and R501 with 27R resistors (red, violet, black, gold, brown)
- Replace MR500 with a 1,3W 16 V Zener
- Replace MR501 & MR502 with a 1N400x (1N4001 … 1N4008) Diode
- Replace C500 & C501 with a 1000, 1500 or 2200µF 25V radial.
- Replace C502 with a 1000 or a 1500µF 25V axial, or a radial one as shown in the second picture





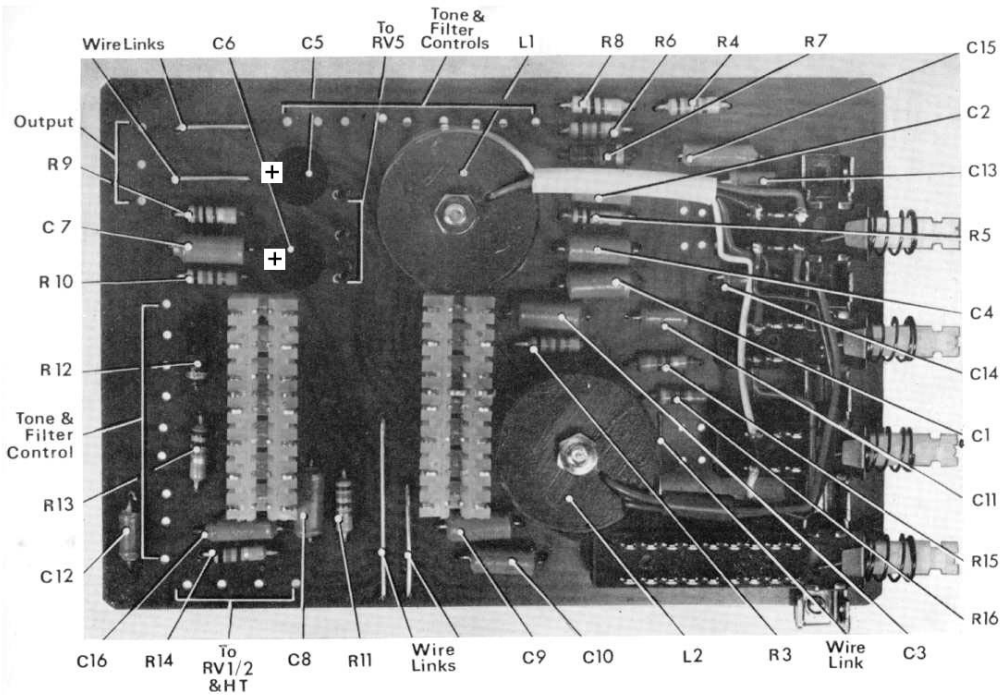
The cathodes (banded ends) of the rectifier and Zener diodes should point towards the middle of the board.



Power Supply Board M 12032

Step 2 - Changing the Balance-caps on the motherboard

- Replace C5 & C6 on the motherboard with 100µF 10V



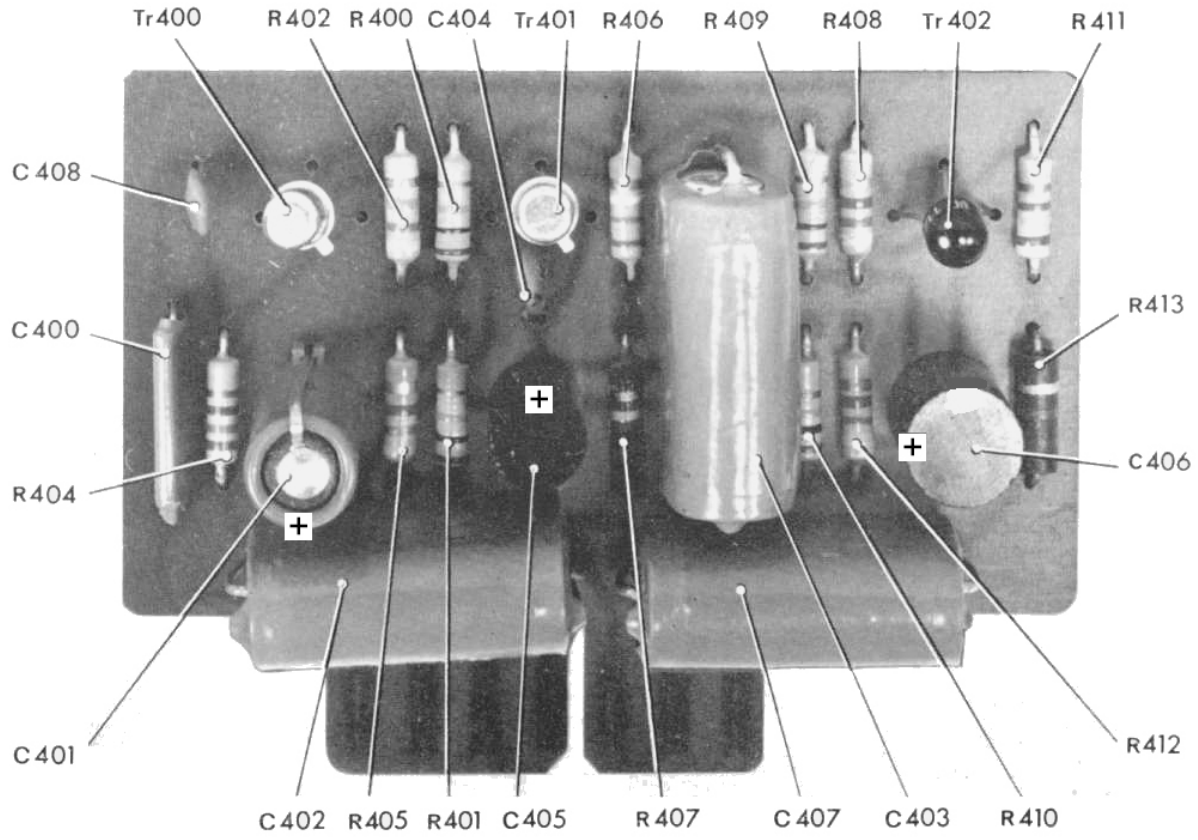
Filter Board M 12029

Step 3 - Upgrading the amplifier boards

As an option, the gain of the 33 can be reduced with a factor of 2.5. This will allow for "modern" sources like CD-players to be connected without distortion to the Radio 1 or 2 inputs. This will also improve the signal-to-noise ratio by about 8dB. Of course, also the old electrolytic-capacitors will have to be replaced. Repeat these steps for both amplifier-boards. See the appendix for the effects this will have on the sensitivity of the pre amplifier.

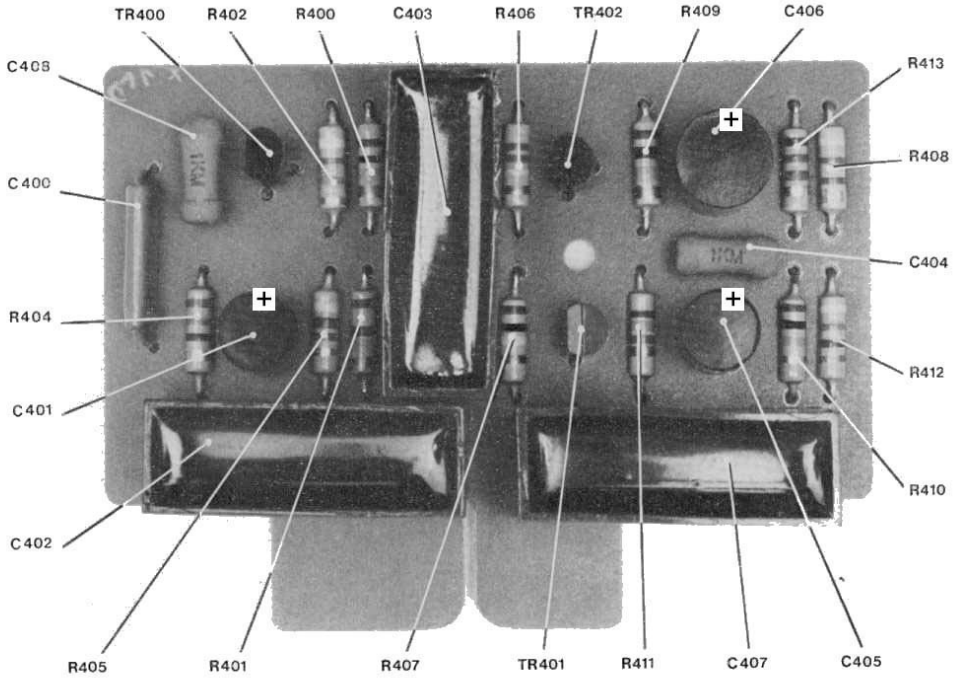
- Replace C401 with 2,2 or 4,7µF (radial)
- Replace C405 with 47µF (radial)
- Replace C406 with 22µF (radial)
- Replace R411 with 1K (brown, black, black, brown, brown)
- Replace R412 with 1K3 (brown, orange, black, brown, brown)
- Replace Tr400, 401 and 402 with BC550

(Replacing R411 and R412 reduces input gain by about 8dB, making it possible to connect a modern input-source like a CD-player to the Radio 1 and Radio 2 inputs. Please refer to the appendix for additional ways to connect a CD player to the Quad 33. When using Quad tuners or the Tape adapter or Phone adapter CD solution, be aware to *not alter* the sensitivity, and connect the CD/DVD player or DACT to the Tape input)

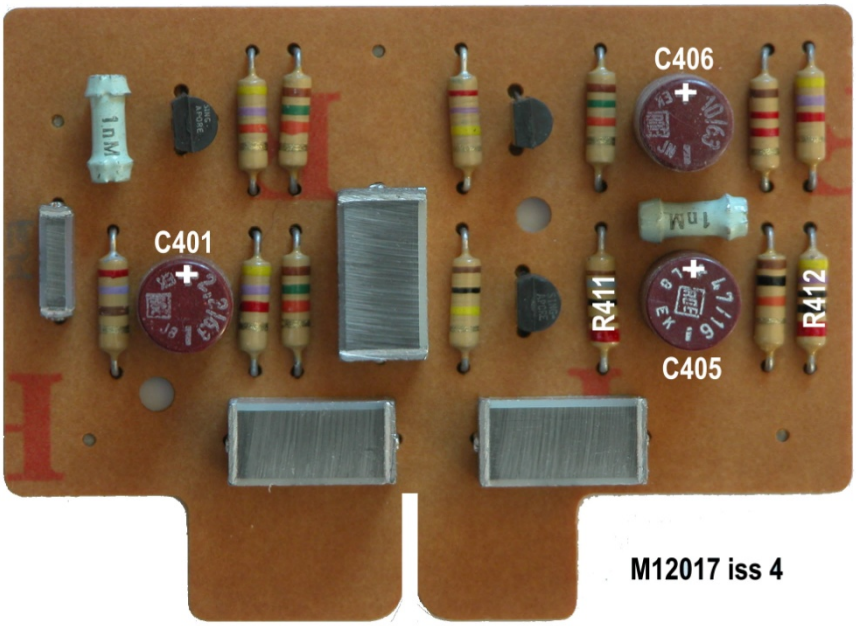


Amplifier Board M 12017 Issue 2

Same capacitor placement for issue 1 boards



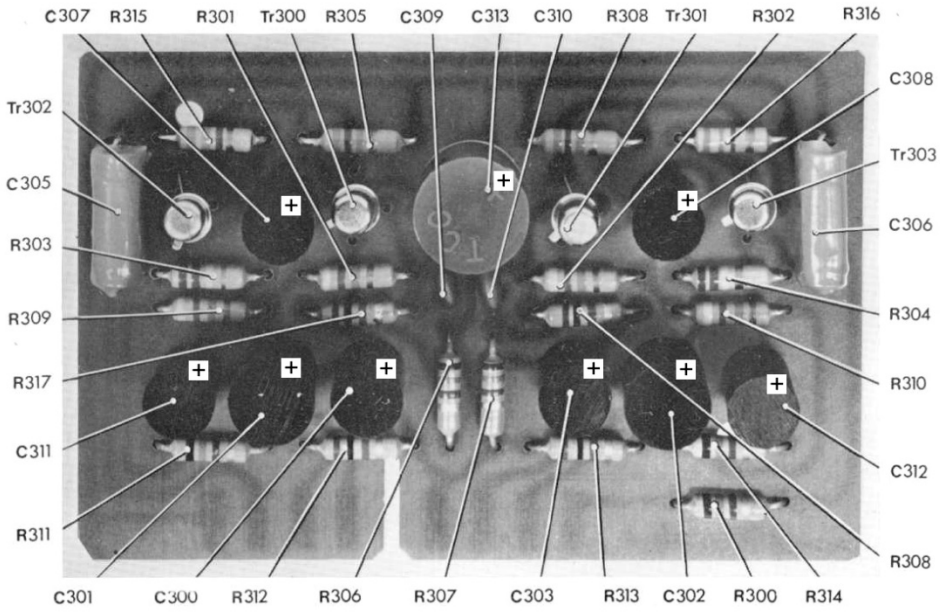
Amplifier Board M 12017 issue 3



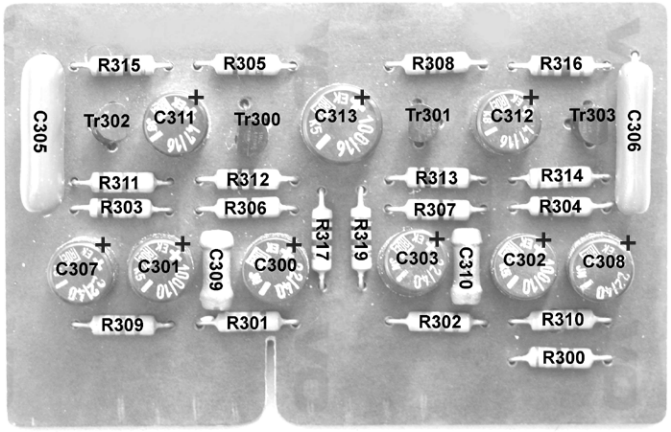
Step 4 - Upgrading the Phono preamplifier board

R300 will have to be changed in order to adapt the phono-preamp to the new power-supply voltage of 16V. All electrolytic capacitors will need replacement as well. R305 & R308 are replaced with 1% metal film resistors.

- Replace R300 with a 2K7 (to adapt the board to the new 16V power supply) (red, violet, black, brown, brown)
- Replace R305 & R308 with an 82K (to lower the noise) (grey, red, black, red, brown)
- Replace C300,C303,C307,C308,C311 & C312 with a 47µF (radial)
- Replace C301 & C302 with a 100µF (radial)
- Replace C313 with 220 or 470µF a 16V (radial)
- Replace Tr300, 301, 302 and 303 with a BC550



Disc Pre Amplifier Board m 12019 issue 2 or 3



Disc Board M12019 issue 4

Step 5 - Adapting the Disc Adaptor Board

To preserve the original gain of the Phono input (if necessary), there are two possible options. First we can use the M1 input instead of the M2 input by relocating the Disc Adapter board, as explained in the User Manual. But if the M1 position is already used, the gain of the M1 section of the board can be increased. This is done by replacing 4 resistors. Please note the deliberate *changing* of the balance between inputs so as to accommodate CD playback, by (i) altering the overall gain and then (ii) altering phono gain.

- Replace R105 & R106 in the M1 position with a 560R (green, blue, black, black,, brown)
- Replace R107 & R108 in the M1 position with a 120R (brown, red, black, black, brown)

As an option (not supplied with the kit - available in the webshop), a change of all 68k resistors R101/2/3/4 to 47k shunted by 180pF can be installed.
This will adapt the input impedance - as usually seen when moving-magnet phono cartridges are used - to better reflect modern standards, which will flatten and extend frequency response.

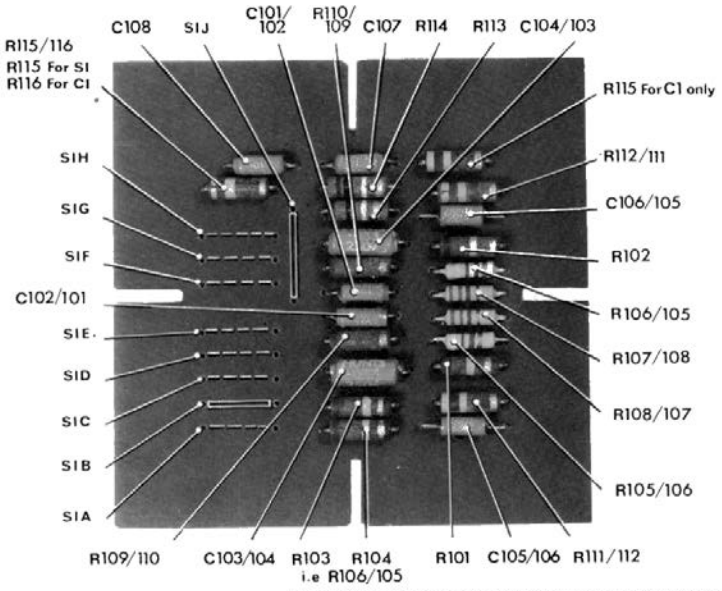
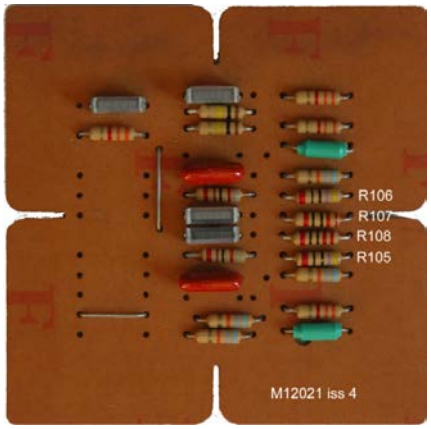


Fig. 4 Disc Adaptor Board M.12021

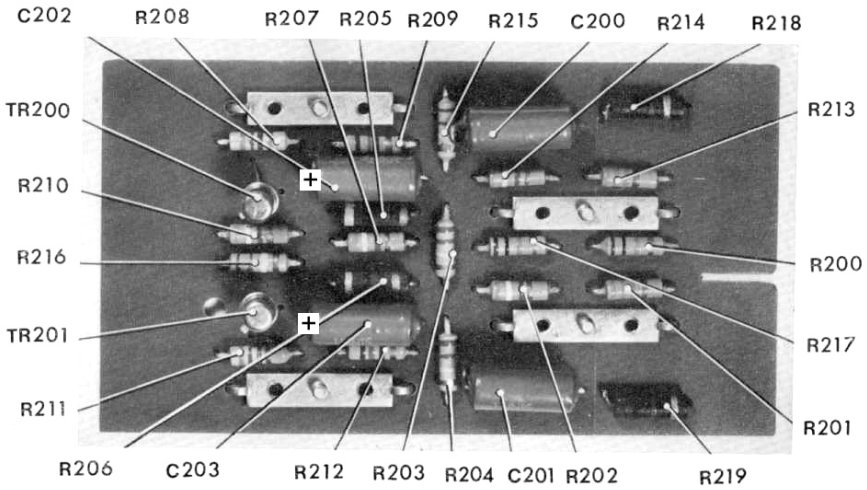
1st number is component ref. in M1, 2nd number is component ref. in M2.
i.e. R106/105 is R106 when adaptor is in M1, and R105 when adaptor is in M2.



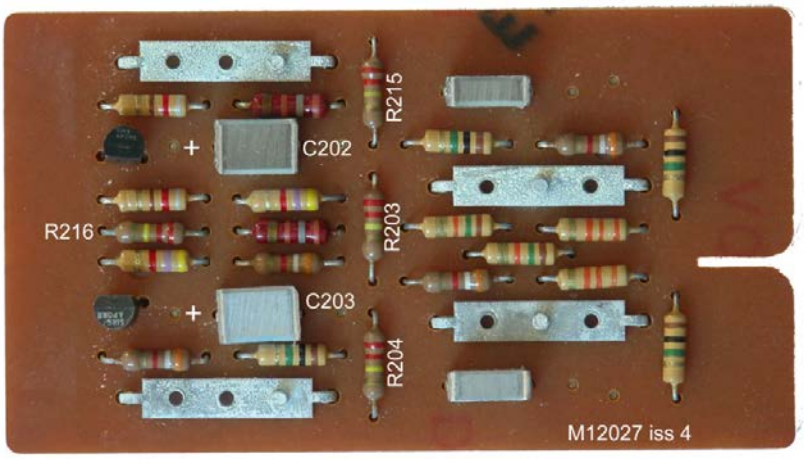
Step 6 - Replacing resistors & caps on the Tape Adaptor board

Another 4 resistors on the Tape-adaptor board will need replacement with metal film resistors. C202/203 will be replaced with 2,2 or 4,7µF in order to considerably improve bass response.

- Replace R203, R204, R215 & R216 with a 220K (red, red, black, orange, brown)
- Replace C202 and C203 with a 2,2 or 4,7 µF (axial), the + (positive) side towards the transistors.
- Replace Tr200 and 201 with a BC550



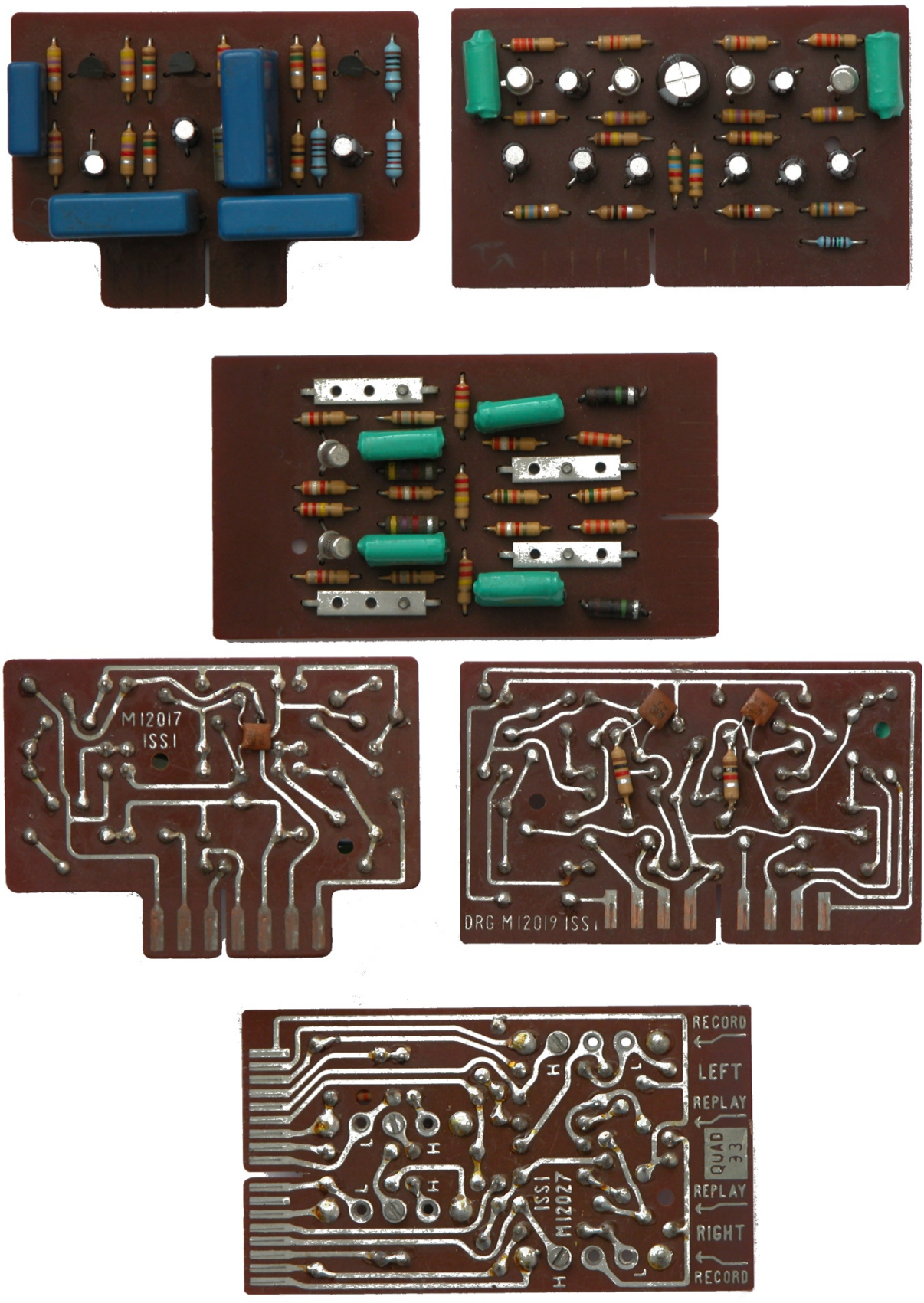
Tape Adapter Board M 12027 issue 1



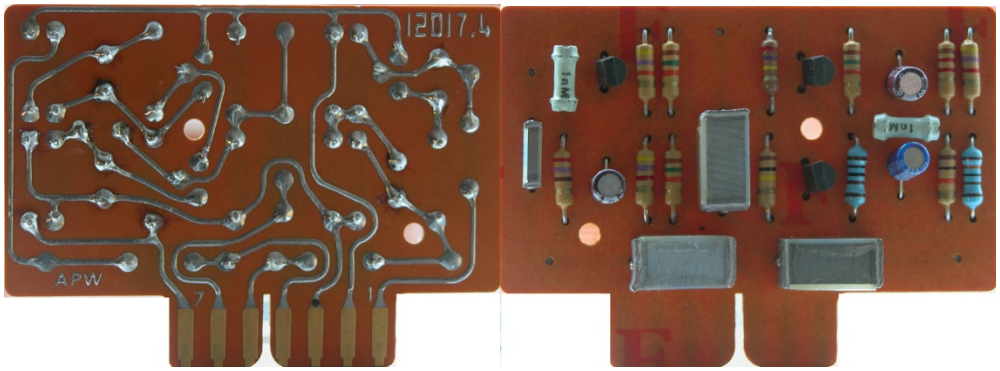
The new C202 & C203 capacitors will have to be mounted with the + (positive) side towards TR200 & TR201.

The sensitivity of the Tape input, as well as the voltage of the Tape output can be adapted by placing the relevant screws in another position (please refer to the owners manual, it is available on the Download-page).

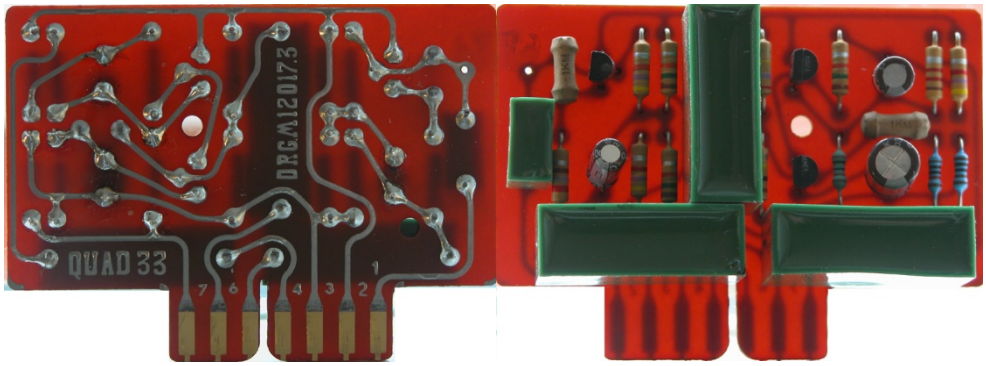
Various issue 1 boards



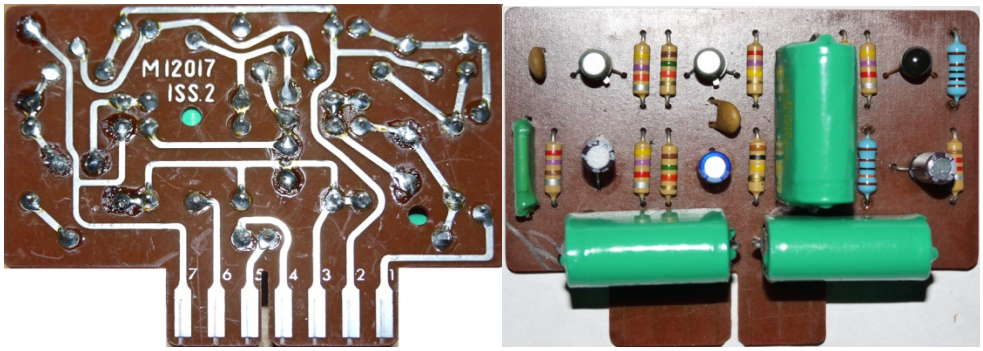
Various boards



M12017 issue 4



M12017 issue 3



M12017 issue 2 with correct placement of elcos, same for issue 1

M12019 issue 1

Appendix I

CD connection options and functional diagram. Changing the mains voltage. Both diagrams as well as service manual can be found here: Downloads.

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

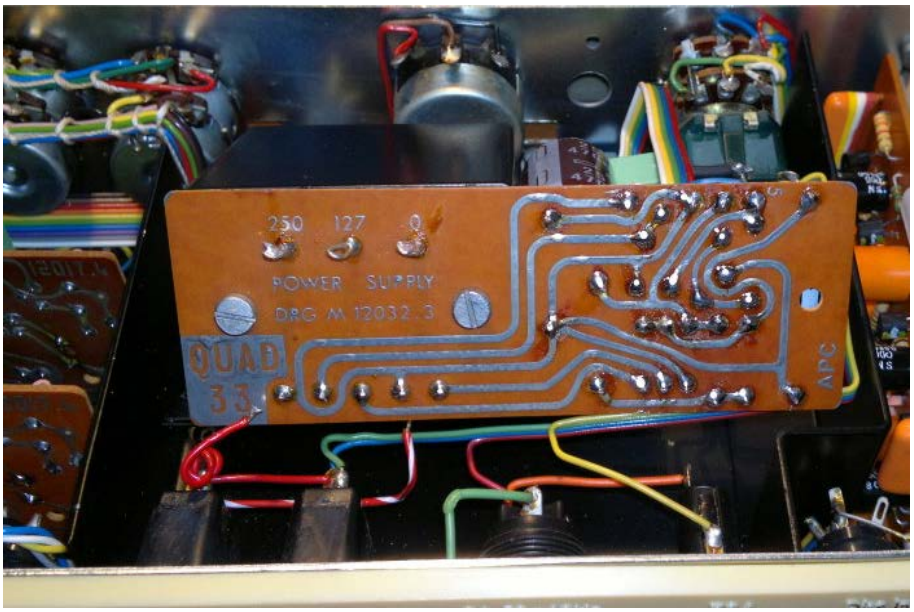
Color	**A** First figure	**B** Second figure	**C** Third figure	**D** Multiplier		**E** Tolerance
Black	0	0	0	×1		–
Brown	1	1	1	×10		±1%
Red	2	2	2	×100		±2%
Orange	3	3	3	×1K		–
Yellow	4	4	4	×10K		–
Green	5	5	5	×100K		±0.5%
Blue	6	6	6	×1M		±0.25%
Violet	7	7	7	×10M		±0.1%
Gray	8	8	8	×100M		±0.05%
White	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 a resistor has 4 bands, ignore column C from the table

Changing mains voltage:



Leave the white striped wire connected. The red wire should be connected to the appropriate terminal, being either 250V or 127V AC. Select the tap which is closest to your local mains voltage.

QUAD

Technical Information

No: 036

Date: 26.09.91

Ref: 33CD/GP

Using a CD Player with the 33 Control Unit

Although the 33 control unit does not have a dedicated CD input connecting a CD player is quite simple. The 33 uses DIN connectors for all inputs therefore a DIN to Phono adaptor is required. Most CD player specifications give an output level of 2V but in practise this corresponds to 300 mV rms from an average disc (10 dB attenuation necessary). Three methods are possible and these are listed below in order of preference.

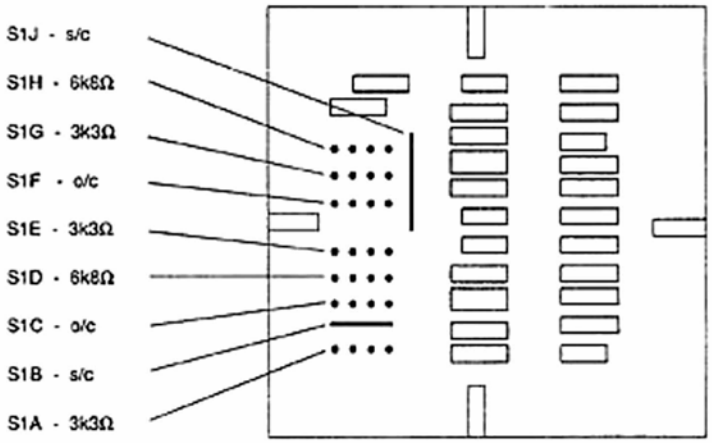
1. **Radio 2 Input:** Use Quad Din to Phono adaptor/attenuator type PCD316M (length 15 cm), with 10 dB attenuation. The standard Phono lead supplied with the CD player is still required.

2. **Tape input:** Set the replay screws, on the tape adaptor board, to their middle position. This provides an input sensitivity of 400 mV which is a suitable match to the 300 mV nominal requirement.
(Not possible if either tape socket is already in use)

3. **Disc input:** Use the S1 (special) position of the disc adaptor board and fit the components for a line input of 300 mV sensitivity, as shown below (input impedance 10 kΩ).
(Not possible if the vinyl disc input is being used)

Position	*300 mV*	*400 mV*	*500 mV*	*750 mV*	*1000 mV*
S1A	3k3Ω	3k3Ω	3k3Ω	3k3Ω	3k3Ω
S1B	s/c	s/c	s/c	s/c	s/c
S1C	o/c	o/c	o/c	o/c	o/c
S1D	6k8Ω	8k2Ω	8k2Ω	8k2Ω	13kΩ
S1E	3k3Ω	2k7Ω	2k2Ω	1k8Ω	1k8Ω
S1F	o/c	o/c	o/c	o/c	o/c
S1G	3k3Ω	2k7Ω	2k2Ω	1k8Ω	1k8Ω
S1H	6k8Ω	8k2Ω	8k2Ω	8k2Ω	13kΩ
S1J	s/c	s/c	s/c	s/c	s/c

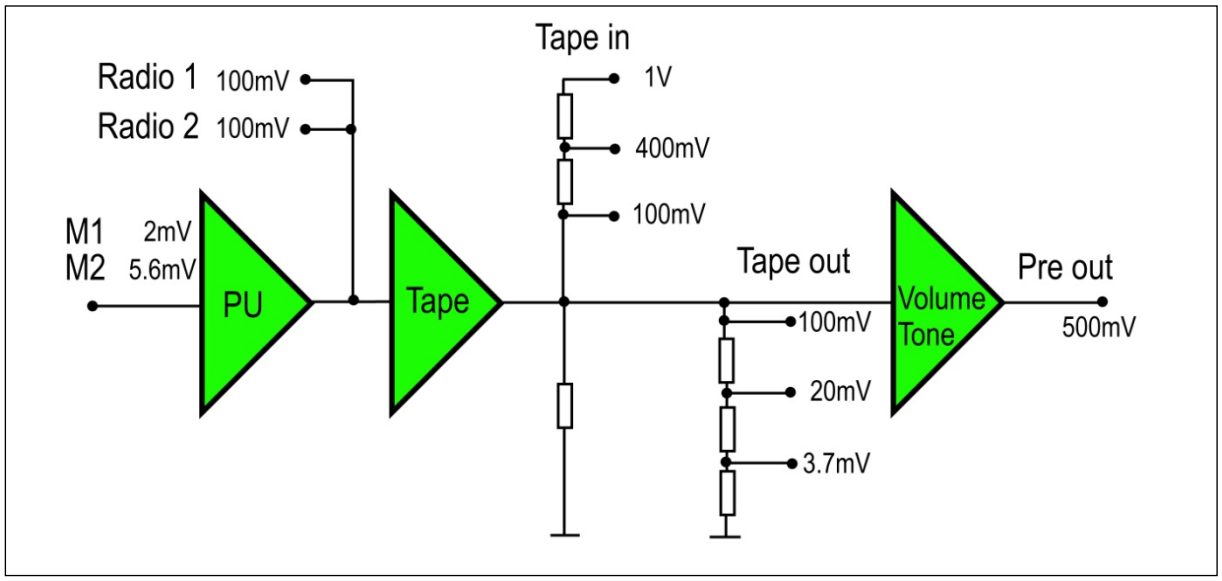
Details for 300 mV sensitivity



33 Disc Adaptor Board

Quad Electroacoustics Ltd Huntingdon PE18 7DB United Kingdom
Telephone: 0480 52561 Fax: 413403

Functional diagram

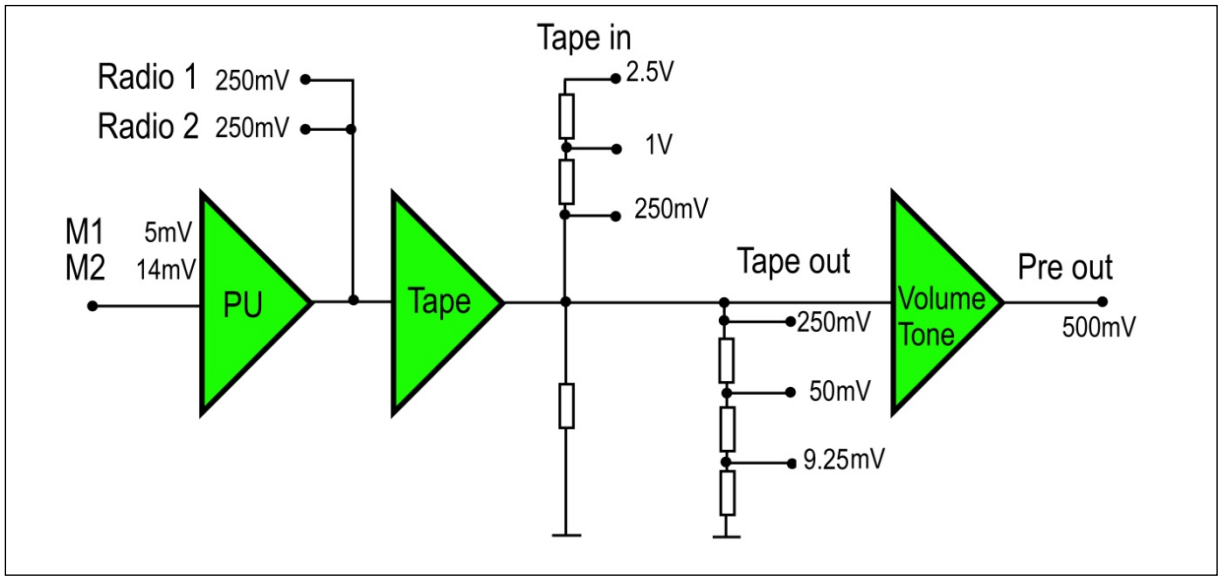


The Quad 33 consists of three different stages:

- The pickup amplifier, including the selector board
- The tape amplifier, including the input and output selector
- The volume and tone control amplifier

The gain of the pickup amplifier is 50 times in the M1 position. The gain of the Tape amplifier is unity. The gain of the volume and tone control amplifier is 5. The “bus” voltage level of the amplifier is 100mV.
In the upgrade process, the gain of the volume stage will be reduced by a factor 2.5

The input and tape output voltages for full pre output changes as follows:



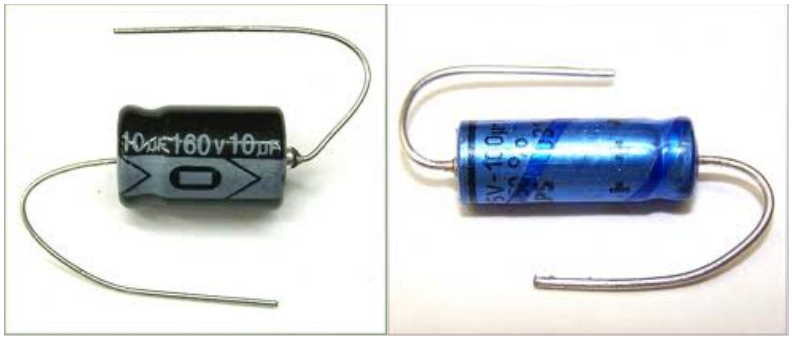
As shown here the sensitivity of the M1 PU position is almost identical to the M2 position as described in the previous situation.

The identification of + (positive) and – (minus) of electrolyte capacitors.

In almost 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 any wiring, the *shortest wire* represents the – *(minus)* !

Capacitors with screw terminals will sometimes show a stripe indication (or indications) on top of the capacitor., if in doubt, please contact us! Connecting capacitors wrongly could cause considerable damage. Be safe!



With axial capacitors, you will find an extra arrow indicating the – (minus) wire, or there will be a printed small ring around the body indicating the – (minus) wire. Also, the – (minus) wire is directly connected to the aluminum body. The + (positive) wire piercess through the black plastic cap.

Indication of the cathode of diodes and zener diodes

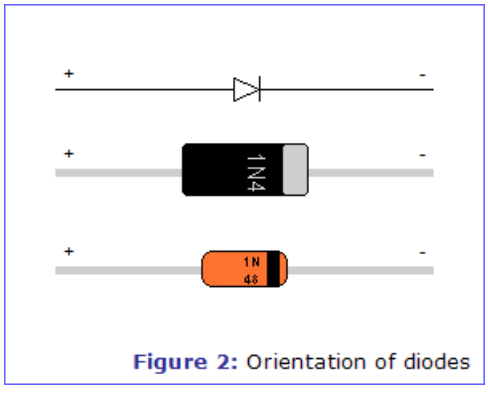


Figure 2: Orientation of diodes

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