Revision manual Quad 66 pre amplifier version 2.4

Introduction.

The Quad 66 is the first (and last!) pre amplifier from Quad with remote control only.

Quad built a remote handset which looks like a Thunderbirds movie prop, but it is very easy to handle and the controls are very intuitive. When the battery fails, the remote set can be connected directly to the 66 pre, the tuner or the CD player as a backup.

Later a ‘normal’ small handset also became available. The complete system consists initially of a pre amplifier, CD player, tuner and power amplifier. During the life cycle of the 66 pre the CD player was upgraded to a model 67 and the power amplifier was also upgraded, but the number remained 606 without a MKII suffix or a new type number, the new case of the 606 have chamfered edges, but there are also old style cases with MKII boards. See the service manual for the different versions.

The 66 pre is built with Op Amps, a microprocessor and electronic switches, also the volume potentiometer is fully electronic.

Quad used the input voltage of the CD player as the ‘bus’ voltage, 300mV instead of the 100mV used in the 33, 34 and 44. So the CD signal is not attenuated, this is good for the signal to noise ratio of this input. The disadvantage of this strategy is that extra gain is needed to bring the record player and tuner signal to the higher level. Extra gain means extra noise. So Quad optimized for the CD input, a good choice. Also there are inputs with hum (earth loop) reduction circuitry, which was novel at that time for consumer electronics. They were intended for video or TV sound connections, due to antenna connections a hum loop is very likely.

Internally the unit is built up with separate Printed Circuit Boards (Pcb’s). One processor board with the power supply, a display driver board, two separated amplifier boards with the Disc amplifier boards piggy backed, and a separate receiver board for the remote handset. During the production the processor board and display driver board were redesigned, the display board was integrated in the processor board. This second version starts at serial number 210600 but is not marked as a MKII version or renumbered to 67 like the CD player.

The second version has also extra programming options. Quad made an extra leaflet concerning these options. We included the leaflet in the Service Manual.

The Disc boards were delivered with five different sensitivities and will match with MM and/or MC pick-ups. Also the Pu boards can be omitted making a second CD player or universal input available.

Between 1989 and 1996, 12,000 units were sold.

The revision consists of replacing al the electrolytic capacitors, replace most of the bipolar couple capacitors in the signal line with wire links and replace the double and quad Op Amps with. Also on the audio boards the electronic switches are replaced with better ones. As an option the lamp bulbs can be replaced if they don't work anymore. The kits are different for the MKI or MKII versions.

There only are components in the kit for the standard 3mV MM Pu boards. For the other versions of this board the components must be ordered separately.

The components are mentioned in the service manual, it only covers the Series I unit. The version of the 66 is easy to recognize; the series I have has a display driver board on top of the white plastic display cover.

Some general remarks:

Before removing components from the Pcb's, make pictures or notes concerning the position and value of the components to be removed. The Pcb markings are not always clear, or are sometimes wrong!

The Pcb's are dual layer in most cases and the holes are fully metalized. So you have to use a very good desoldering pump or -station. Sometimes it is easier to remove the component by clipping the 'pins' on the component side of the Pcb with small pliers and remove the remains from the Pcb with the desoldering pump or -station. Do not apply to much heat or force, the copper tracks are vulnerable.

Components may change without notice. We will always try to deliver the best components our suppliers have. The voltage value of a replacement capacitor may be higher than the original capacitor, but this is no problem.

Also due to standardization we have to choose some values as close as possible to the original, i.e. a 50uF capacitor doesn't exist anymore, the nearby replacement is 47uF. In coupling stages a larger capacitor is better suited for the job, but in a RIAA network or other filter you need precision!

This manual will be updated when necessary; the latest release can be downloaded from our website. It is recommended to also download the Service manual from our website, general construction and circuit layout is explained in the Service manual.

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. 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.

Stefaan & Joost, September 2017.
www.dadaelectronics.eu

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 high quality 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 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 web shop.

The components in the Quad 66-kit are in the parts-list on page 4.

During the revision you will replace all electrolytic capacitors as well as the (dual and quad) Op Amps and the electronic switches on the amplifier boards.

Parts list					
	Main Pcb series I				
Capacitor	Value	Quantity	Type	Voltage	Diameter/Height
C300	100uF	1	elco/radial	10	
C303	4.7uF	1	elco/radial/bi	25	
C304	2.2uF	1	elco/radial/bi	25	
C306,307	100uF	2	elco/radial	16	
C308,309	1000uF	2	elco/radial	16	
R329,331	4K7 Ohm	2	Resistor		
	Receiver Pcb series I				
Capacitor	Value	Quantity	Type	Voltage	Diameter/Height
C403	68uF	1	elco/radial	10	
C407,408	100uF	2	elco/radial	10	
	Top Display Pcb series I				
Capacitor	Value	Quantity	Type	Voltage	Diameter/Height
C351	22uF	1	elco/axial	25	
	Audio Pcb 2 pieces				
Capacitor	Value	Quantity	Type	Voltage	Diameter/Height
C6	1000uF	2	elco/radial	16	
C7	100uF	2	elco/radial	16	
C8,9,10,19, 21,27	wire link	12			
C11, 37	100uF	4	elco/radial/bi	16	
Ic	Value	Quantity	Type	Voltage	Diameter/Height
Ic7	LME49720	2			
Ic1,5	TL074	4			
Ic3,4,8	4066	6			
	Phono Pcb 2 pieces 3mV				
Capacitor	Value	Quantity	Type	Voltage	Diameter/Height
C101	100uF	2	elco/radial	10	
C105	2.2uF	2	elco/radial/bi	10	
C102, 103	4.7uF	4	elco/radial	10	
Ic	Value	Quantity	Type	Voltage	Diameter/Height
Ic100	LME49720	2			
	Main Pcb series II				
Capacitor	Value	Quantity	Type	Voltage	Diameter/Height
C1,16	1000uF	2	elco/radial	35	12
C2,3,9	22uF	3	elco/radial	35	5
C17, 18, 24	100uF	3	elco/radial	25	6
C19	1000uF	1	elco/radial	16	10
C20	2.2uF	1	elco/radial	25	5
C22	10.000uF	1	elco/axial	16	20 x 40
	Receiver Pcb series II				
Capacitor	Value	Quantity	Type	Voltage	Diameter/Height
C5,6	100uF	2	elco/radial	10	
C4	68uF	1	elco/radial	10	
C1	22uF	1	elco/radial	25	
	Remote Control Scepter				
Capacitor	Value	Quantity	Type	Voltage	Diameter/Height
C13,17	22uF	2	elco/axial	25	
C16	1000uF	1	elco/axial	10	

Decoupling caps	100nF	8	Ceramic	50	

Lamp bulbs (optional)		5		5	

The revision.
Study the service manual to get an idea about the general layout and construction of the 66. In the service manual all the component layouts are viewed from the solder (copper) side of the boards. Make notes or pictures concerning the original components en positions on the boards, especially the polarity.

- Remove the cover; the cover is fastened with 4 screws accessible from the bottom of the unit.
- Remove the plastic bottom by releasing all the screws on the Main board Pcb and the four screws in the side rails. Leave the front and back panel in place and also the white plastic lamp cover.
- Release the black and red wire connector for the auxiliary supply for the remote control. If the bottom plate is removed, there should be easy access to the solder side of the Processor board and the lamp bulbs.
- Remove the two amplifier boards by releasing the 8 screws at the rear of the unit, desolder one earth wire and release the second earth wire by removing the nut and bolt.
- Disconnect the flat cables.

Audio boards.
- Remove the piggybacked PU boards by squeezing the plastic pin which is connected to the Amplifier board.
- Remove all the electrolytic capacitors.
- Replace C8, 9, 10,19,21,27, with a wire link, wire links can be made of the surplus length of the component wires after soldering.
- Replace C6 by 1000uF 16V, replace C7 by 100uF 16V, the plus towards the minus of C6.
- Replace C11, 37 with 100uF 16V Bipolar.
- Remove Ic 7, replace by LME49720 dual opamps.
- Remove Ic 1, 5 and replace with TL074 quadruple opamps.
- Remove Ic 3, 4, 8 (4016) and replace by 4066 analog switch Ic's.

Phono boards
- Remove C 101, 105 and replace by 100uF and 2u2F bipolar.
- Replace Ic100 by LME49720.
- Replace C102, 103 with 4.7uF, polarity is marked in the service manual drawings.

These values are for the standard 3mV MM boards, for the other boards the components have to be ordered separately.
- Place the Pu boards on the amplifier boards and store them in a save place.

Series I Main Processor board.
The series I board differs substantially from the series II. Also the main power cables differ as well as the relay configuration, in some cases the wires are soldered in other cases connectors are used. Be careful with the display unit and the plastic white cover.

If you have to desolder the power cables, mark them or make pictures or notes!

- Remove the connector for the remote control board from the processor board. Do not remove the display driver board and the lamp cover, be very careful with the display itself!
- Remove the electrolytic capacitors C300, 303, 304, 306, 307, 308, and 309 replace them with the corresponding values from the list, C303 and C304 are bipolar.
- Replace R229 and R331 by 4K7 Ohm to prevent current limiting problems in the Psu.

Series I Reciever board
The sa[1]me procedure for the small remote control board.

- Remove C403, 407 and 408. Check the polarity in the diagram and Pcb layout in the service manual.

Series I Top Display board.

- Remove C 351 and replace it with the corresponding capacitor from the list. It should be posible to do this without removing the displaydriver board!

Replacing the lamps (optional).

- Remove the lamps from the processor board by turning them anti clockwise (as seen from the copper side of the processor board). Now there are two options, the easy way, soldering the new lamps to the copper side of the processor board. The difficult way, removing the lamps from the plastic holder and replace the lamp in the holder, see the pictures!

Series II Main processor and display driver board.

- Remove the remote control board from the main board.
- Replace the capacitors C1, 2, 3, 9, 16, 17, 18, 19, 20, 22 and 24 by the corresponding value from the list.
- If necessary, replace the lamps as described by the series I board.

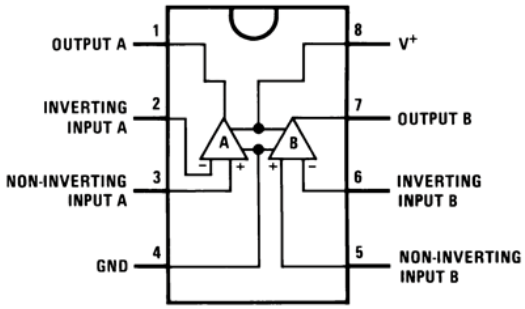
Series II Reciever board

- Replace the capacitors C1, 4, 5 and 6 by the corresponding value of the list.

Reassemble the unit, first the processor board and the power cables. Reassemble the amplifier boards and also the remote control board.

Decoupling caps, for all Op Amps

LME49720 (top view, component side!)



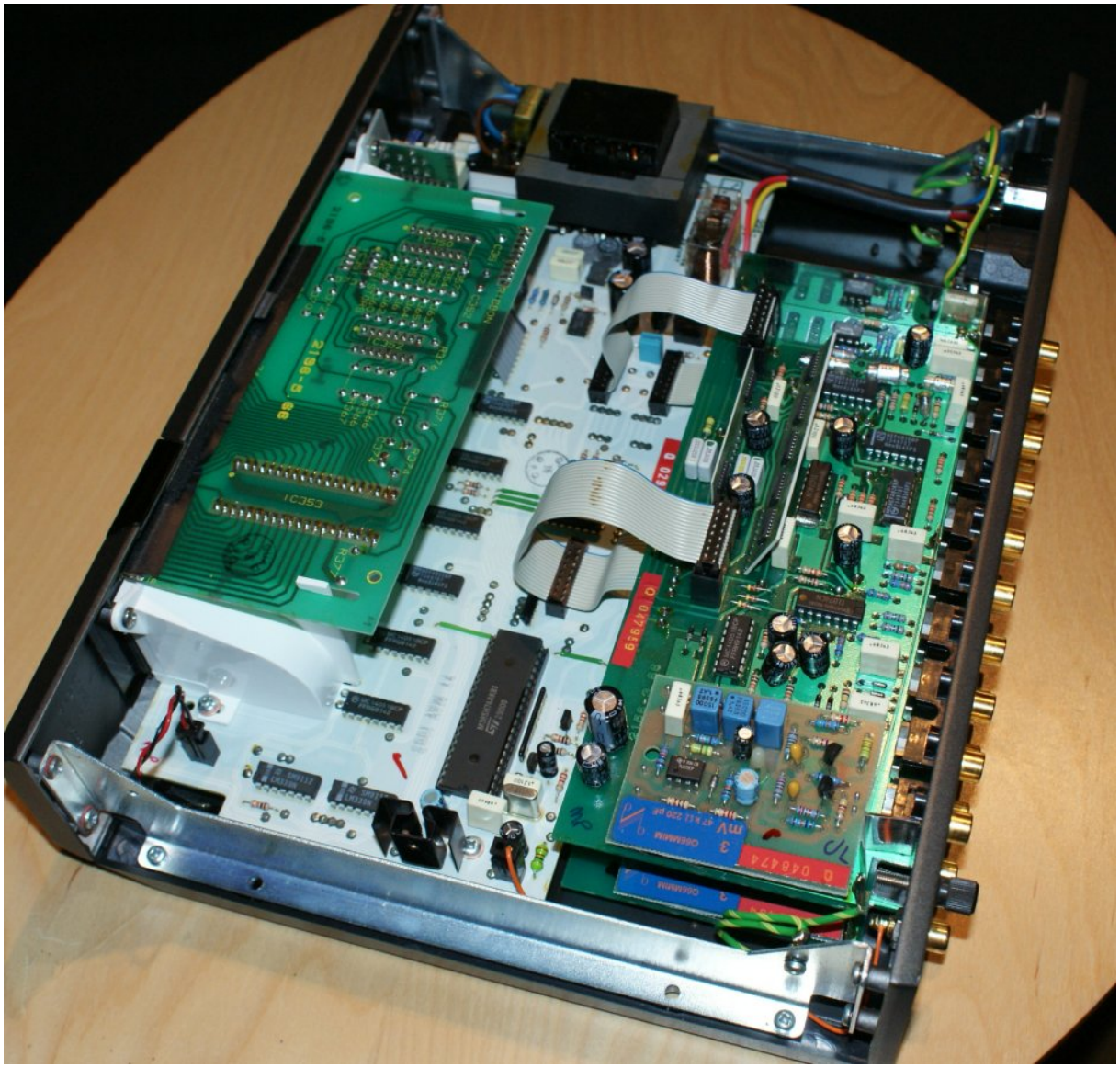
- Solder a decoupling cap between pin 4 and 8 copper side, double check this!

TL074 (top view, component side!). LME49740 is no longer produced so we use good quality TL074 instead.

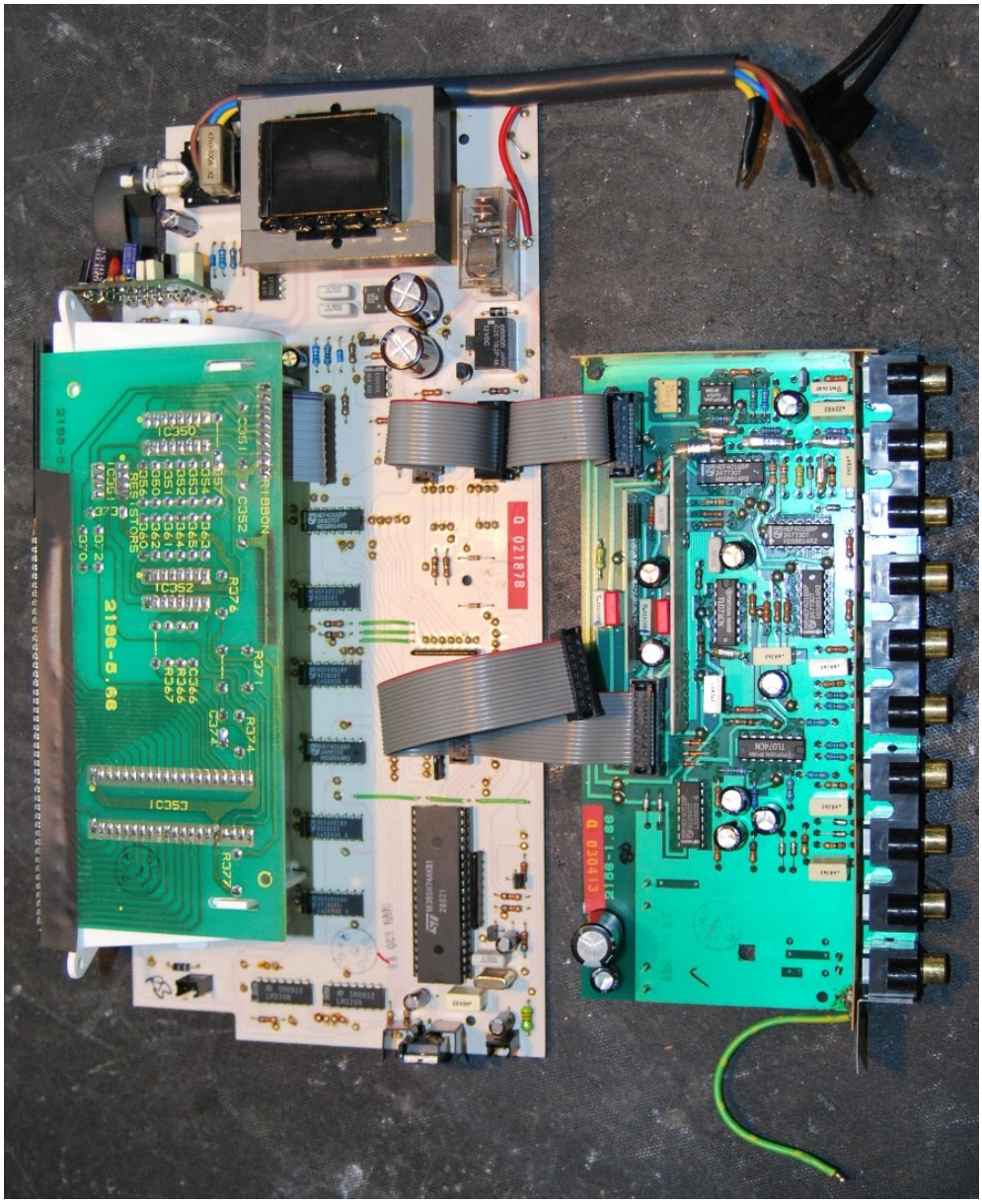
Solder a decoupling cap between pin 4 and 11 copper side, double check this!

Remote control (Scepter)
Use the service manual as a reference to dismantle the unit.

- Replace C13, 16 and 17.

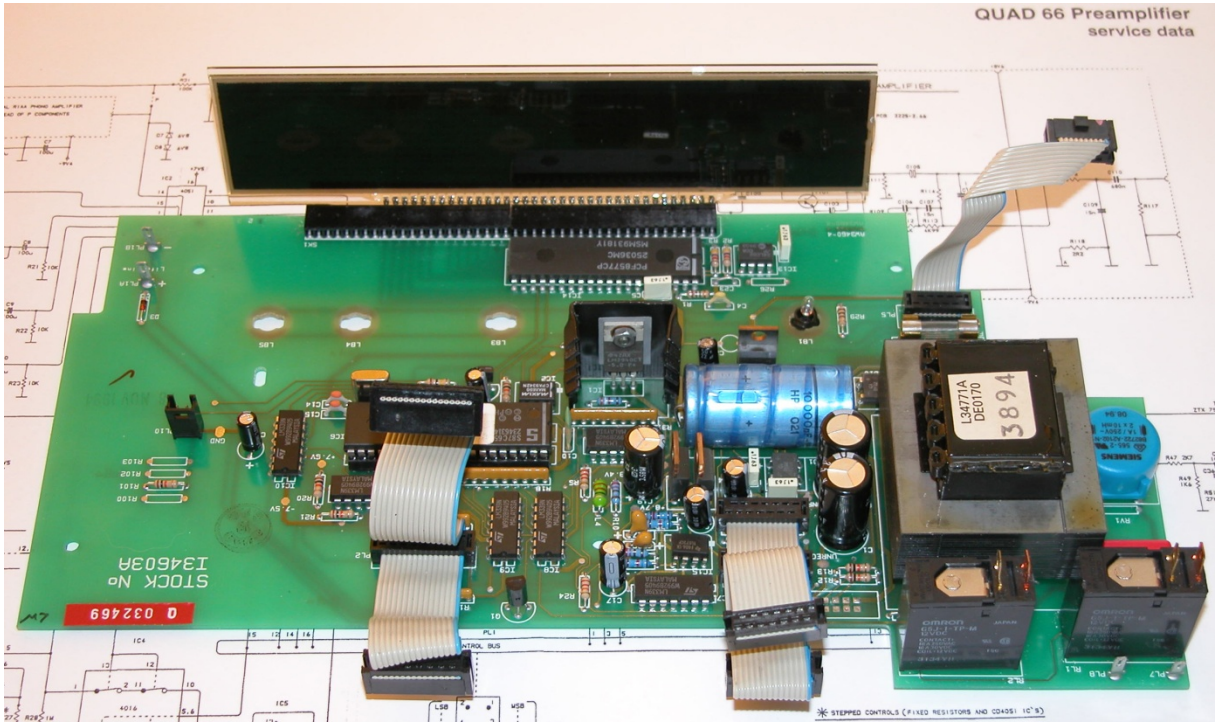


Quad 66 Series I, picture courtesy of www.Quad-Hifi.info Duncan Rolfe

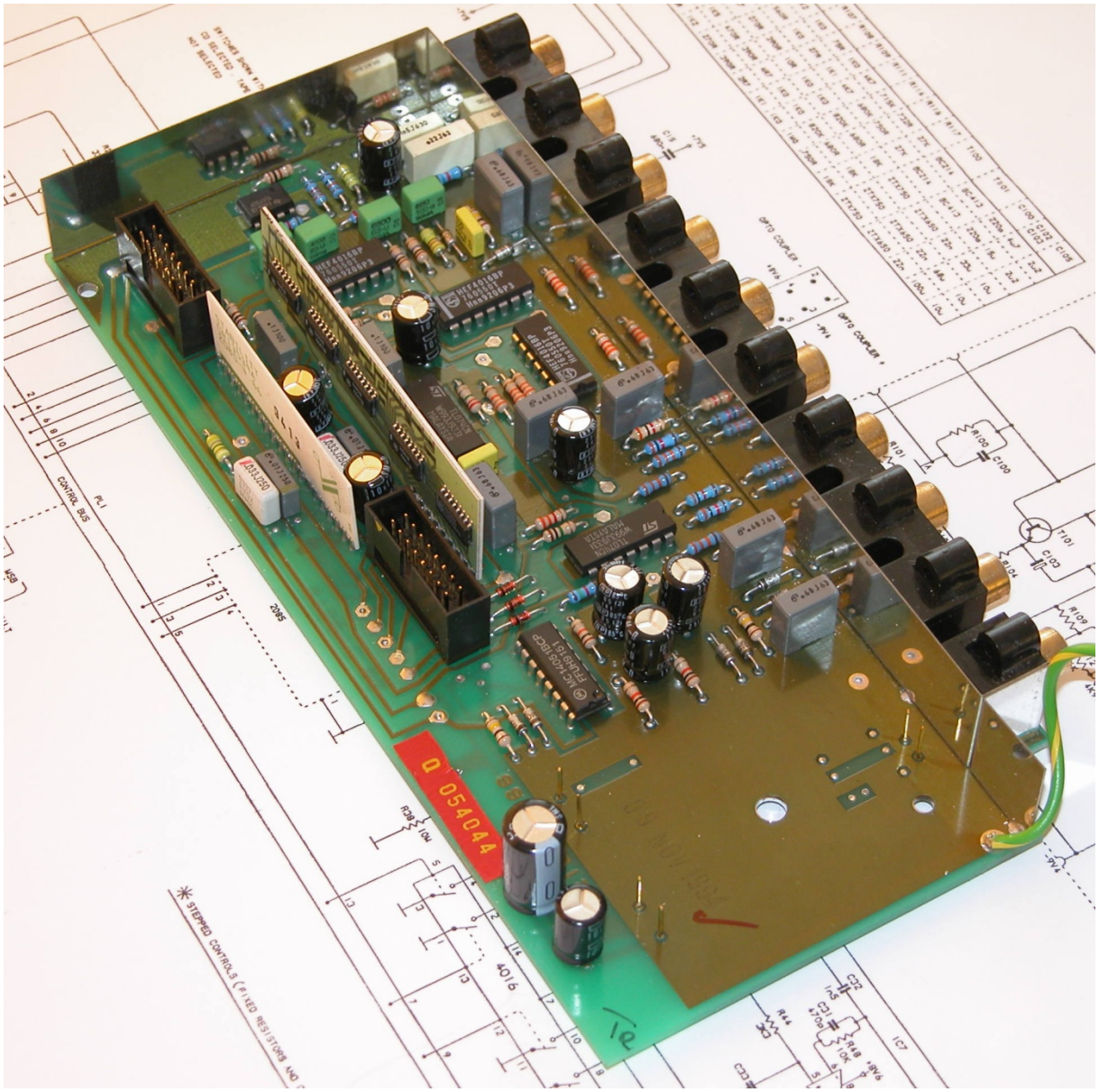


Series I Main board, Top Display driver board and Audio board, Phono module removed

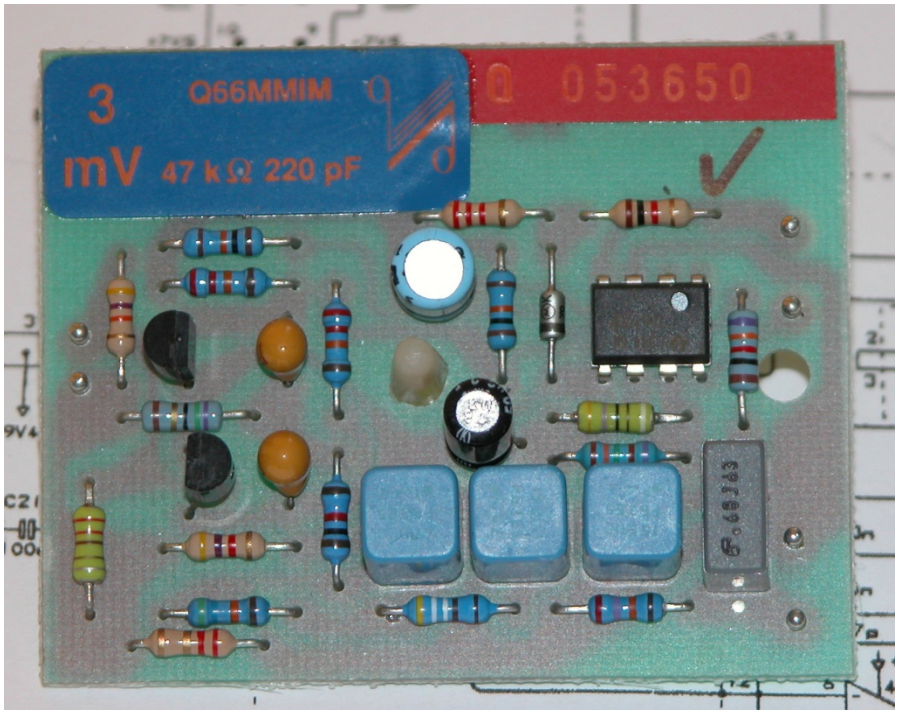
Series II



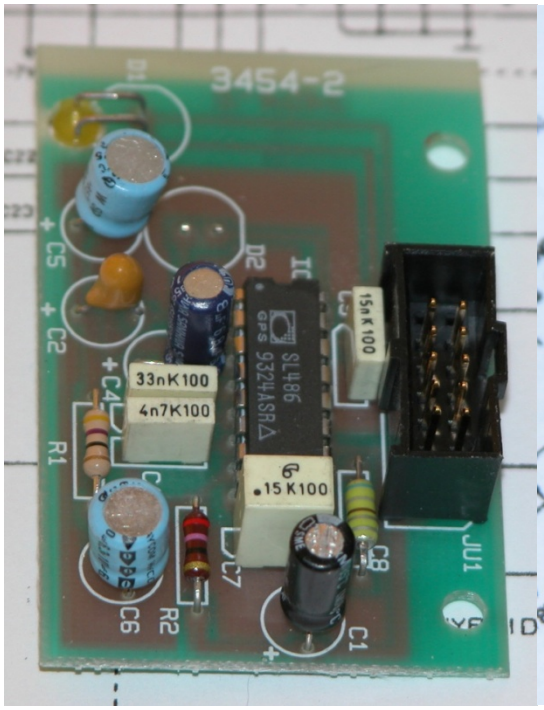
Series II Main processor and display driver board



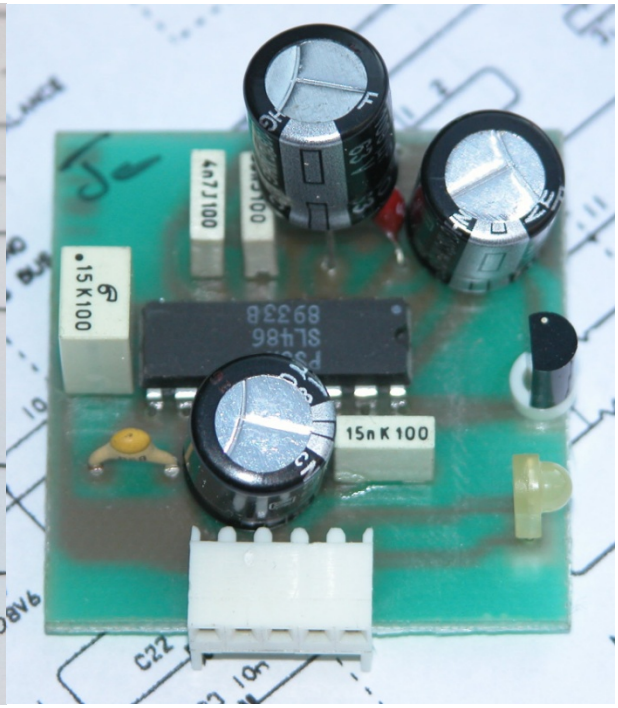
Audio board without the Phono module



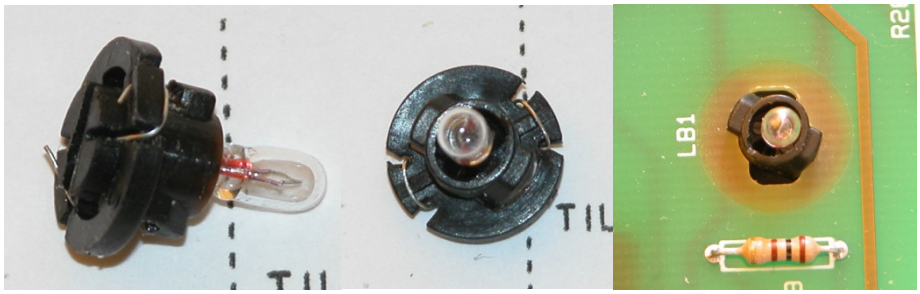
Phono module



Series II Reciever board



Series I Reciever board, the caps are original!!

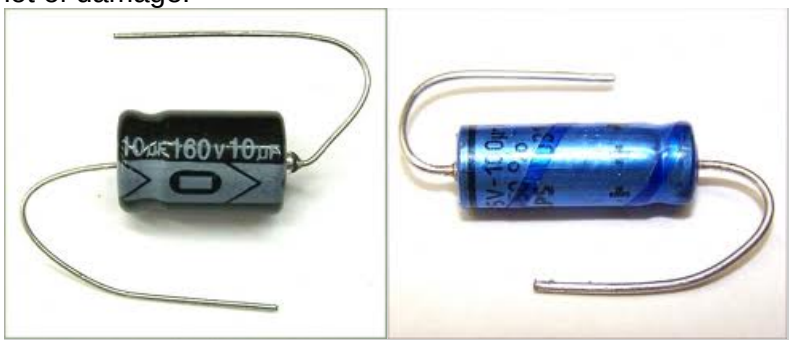


New lamps fitted!

The new small remote control

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

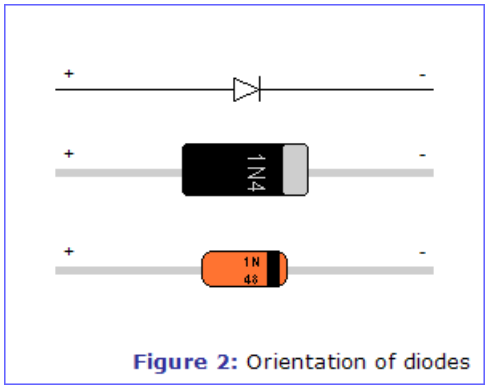


Figure 2: Orientation of diodes

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