

QUAD-Adventure.

In the 80`s I had a lot to do with high-end-audio because I worked with a small German hifi-manufacturer. At this time I first came in contact with QUAD. I heard the ESL57,-and instantly knew that this speaker is one of the most famous ones ever built. I bought a pair and later on bought a second pair together with a complete QUAD-II-amp line with the dedicated tuners (AM and FM).

This equipment delivered jawdropping results,- I stacked the ESLs and my living room was filled with finest music for almost 5 years. When the ESLs began to suffer from their age (two of them lost sensitivity and had almost no output anymore), I unfortunately sold them to a friend.

I also sold the QUAD-II-line because I needed some money in these days.

I bought a QUAD 33/303/FM3- system in the early 90 and use it since then with my headphones and my GSP-speakers. I always liked the sound of the 33/303,- it is very musical,- delivering many, many room information.

Recently I became familiar with electrostatic headphones,- in 1999 I started my several refurbishment-activities with these kind of headphones. I trained a way to reattach new diaphragms and bring them to new life again. I had succes with these rebuilding-jobs and began to think about a bigger, more complex project concerning ESL-speakers.

I did a lot of research in the internet,- found several websites containing very interesting articles about the refurbishment and construction of ESLs.

I first thought about building my own ESL,- I started to collect materials and parts, wrote emails to several experts on building ESL-panels,- made construction plans and discussed it with several experts again. In the middle of all these activities and plandrawing I stumbled over a pair of QUAD 57`s in eBAY-Germany for a very,very nice price.I knew that these speakers MUST be defective and need a lot of work, but I also knew that they are famous when they are refurbishd and unbeatable by a DIY-construction made by myself.

I bought them the same day for 300EUR and picked them up in Hannover the next weekend.

16.03,2002

I had a first look into the speakers when I picked them up to be shure that everything was there and no parts were missing,- the owner had ripped away all of the dustcovers, the felt, the damping material. The legs and the side-rails were missing and the grilles had many dings.

But,-- all other parts (transformers, panels etc.) were there,- so not everything seemed to be lost.



That is what I got for 300 EUR,- very sad looking and a lot of work...

19.03.2002

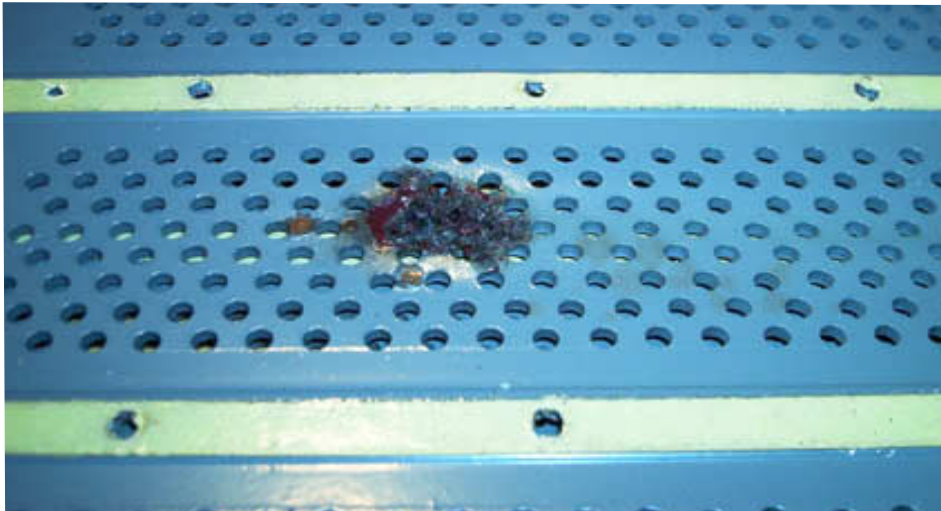
The first thing I did was connecting the speakers to the mains and to my amp to see if ANYTHING will come out of them. The powersupplies fired up and I carefully turned my volume-knob to the right. I was somewhat astonished when I heard that there WAS music. All of the bass-panels did work.

When I turned louder the treble panels started to produce crackling noises and distorted much. I could see blueish sparks in both of the treble-panels, they arced really bad. I inspected the outside of them and saw that they must have been overdriven for a longer time because some of the material forming the electrodes was melted at several points. This was very annoying,- I knew that the refurbishment of the treble-panels won't be easy at all. I had found some websites describing how to rebuilt treble-panels,- so I dismantled the panels and opened them to inspct the insides.

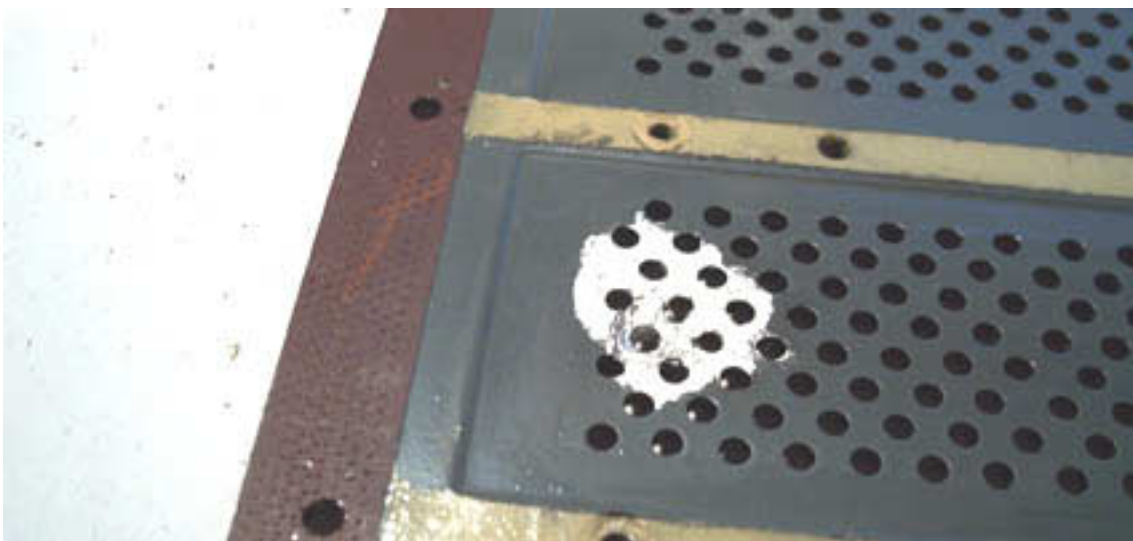
There were several burned areas in the middle cavities (treble),- one of the cavities has been so much heatened that it was deformed,- the electrode was bent to the inside and the gap between the Mylar and the electrode was no longer there. The Mylar touched the electrode at these points. I took all of the Mylar away and decided to rebuild the electrodes completely by sanding the burned points, repainting with silver-paint, and reinsulate the coating.

22.03.2002

The deformed panel had to be rebuilt with heat. I applied heat from a heat gun,- just as much that the material could be formed back. I could manage to bent it the way it once was and was very happy that it came out that nice.



burned middle cavity of one of the treble electrodes



after sanding and repainting with silver-paint



both pictures show the electrodes that were bent inwards because of heat,-- after rebuilding



I taped the outer cavities and sprayed several layers of “plastic-spray” over the rebuilt panels, to insulate the conductive coating against the diaphragm and the other electrode. Other refurbishers recommend “corona-dope” for that purpose.

01.04.2002

When I was ready with the rebuilding of the electrodes for the treble panels, I ordered Mylar for the diaphragms via THE AUDIO CIRCUIT,- Hans Zeeuwe helped my by that. I decided to take 4 micron Mylar but also ordered some 6 micron Mylar.

In the meantime there was enough work to be done with the rest of the speakers.

02.04.2002

In the next step I took out all four bass panels for inspection and for rebuilding of the dustcovers. I removed all of the wooden frames and tape, that is glued around the perimeter of the bass panels. I also removed the tape that is glued over the rivets, that hold the two electrodes together. There is always some corrosion around these rivets which makes a high-resistive short-connection between the Diaphragm (which holds the high-voltage and is in contact with the rivets) and the outer part of the panel. This connection often results in leakage and causes high-voltage-loss of the panels. I cleaned these areas and put on some new tape around the panel over the rivets.

I removed the glue on the wooden frames and sanded them to get a nice and smooth surface again.

For the dustcovers I bought a window-sealing-kit from "tesa", it contains enough of heat-shrinkable foil with the appropriate thickness and the dedicated double-sided tape to mount the foil. I taped the frames around the perimeter, stretched the foil on a wooden plate with "tesa"-tape and glued frames and foil together.

I did that with all 8 frames,- this is very time consuming and boring but is essential to protect the panels against dust and dirt.



glueing the window-sealing-foil to the bass panels`s wooden dustcover-frames

Before I reassembled the dustcover-frames to the bass-panels I vacuum-cleaned the bass panels through the holes of the electrodes with my vacuum-cleaner switched to 1/4 power very careful.

The reassembling of the dustcovers is not easy because the connections of the panels have to go through the foil to reach the connection-boards which are screwed to the wooden frames. You have to melt 3 holes per panel into the foil,- never cut these holes,- the foil will tear instantly. I used my soldering iron to melt them in, that works great, it seals the edges of the holes.

By holding both frames to the front and back of the panels, I sealed the outer perimeter with packing tape and glued the frames and the panels together very carefully. The tape goes from the back frame over the electrodes to the front frame,- making the whole construction dust-prove all around. I took special care to the corners,- here I taped double. Heatshrinking of the foil would be done when everything is in place later.

That is how the newly sealed bass-panels look like.

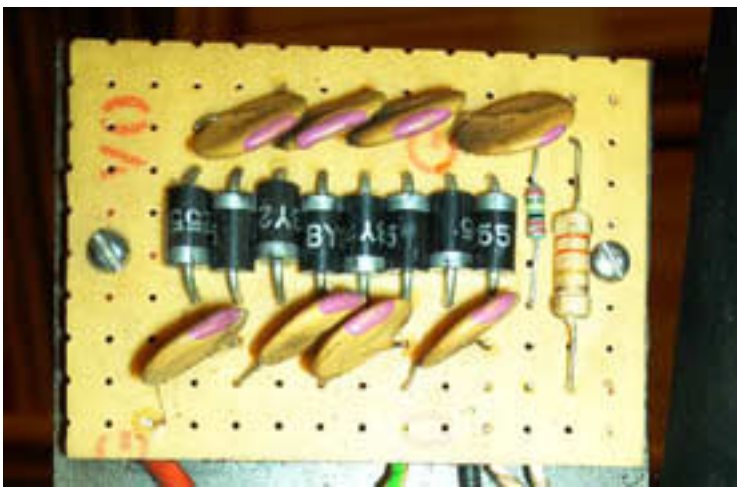


04.04.2002

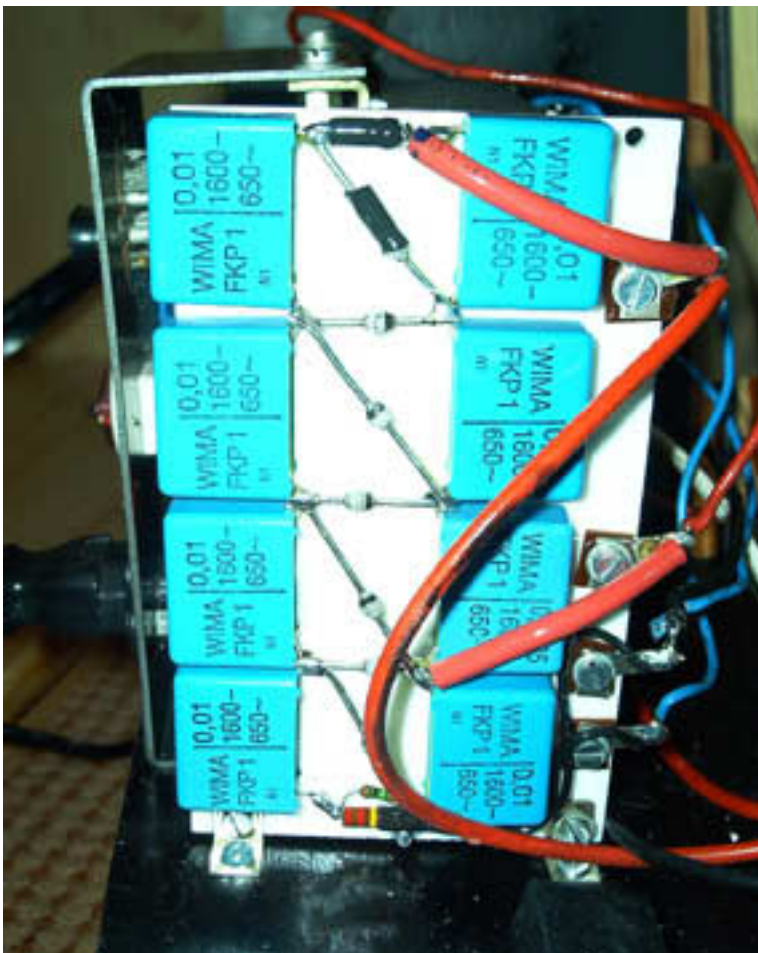
Still waiting for the Mylar,- I decided to overlook the high-voltage supplies (EHT-units) of my speakers. First of all I dismantled the original Bulgin-plugs and fitted ordinary power-plugs into the units to make mains connection easy. The holes have to be somewhat bigger for that and there must be new screw-holes drilled for the plugs themselves. I drilled the holes and,-- what a SHOCK!,- drilled into one of the mains-transformers by accident. I was disappointed about my own fault and felt crazy about that!

The transformer could not be repaired, so I had to find a spare. I searched the web and found out that the original spare-part can be purchased at "German QUAD-Musikwiedergabe" but costs were much. I also found out that there are transformers available at "Conrad-electronics", for 1/4 of the price,- so I decided to buy the cheapest ones first. I managed to connect two little transformers in series to get 610 volts and paid about 15EUR for them,- great!

The voltage multipliers of the EHT-units were rebuilt-ones. One was made new maybe 20 years ago,- the other was a rebuilt original one (bees-wax-type). I measured the voltages of both and found out that they produced different voltages (almost 600V difference), so I decided to rebuilt them both new at the end. I made a sturdy construction with big "WIMA" capacitors and modern diodes (BY 228), fitted on a plastic-board.



This board was mounted when I purchased the speaker,- it looked good but had voltage loss,- maybe the parts were too close one to the other.



These are my new EHT-multipliers, I screwed them onto the base near the transformer-unit.

So, here is what I had done until now:
bass panels ready to be mounted,
EHT-units ready to work,
electrodes of the treble panels ready and like new...

Not much? These 3 things was 2 weeks work in the evening. I did this all after my regular work and everytime I could spend time for it at weekends.

07.04.2002

Next, I had to do all that wood work, concerning the frames of the speakers and rebuilding the damping of the back grille. I also had to provide the treble panel`s dust covers with foil to make them ready to be mounted onto place when the Mylar will arrive. I did not want to let the panels open for a longer periode of time.

I also found out that there is a modification to be done when the speakers will be used together with the QUAD 303 amp. This mod. was built into later models of the ESL 57 but mine were from 1963! I got the schematics and did the modification:

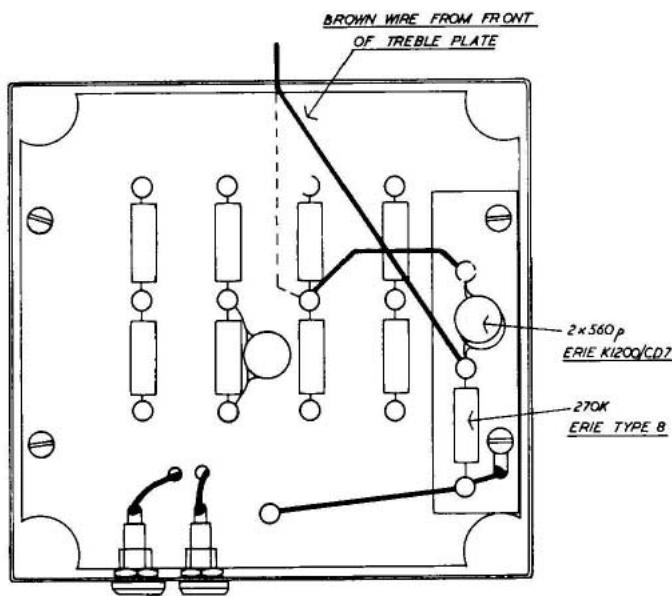


Fig. 2.

QUAD`s modification to use the speaker with the 303 amp

After that I sanded all of the wood, filled the holes and sanded again. I resprayed everything with black spray. I covered the inner parts of the frames where the panels hit the sides with a special damping wooden tape to prevent these points from producing rattling noises. I did that in the 80s with the speakers we built in that time and it was always worth the effort. Here is, how it looked before and after:



11.04.2002

sanding and filling the frames.....there were many holes in the outsides, maybe they were stacked once....



12.04.2002

I glued that tape into the frame to prevent from any rattling noises between panels and frame,- I never saw that anywhere else but I think it is worth it.





So far so good. All bass panels ready, frames and EHT-units ready, audio-transformer modified-- at this time I saw a little light in front of me,- far away but to be seen yet.

I was in need of feet for the units. And I needed the damping material for the back grille also still. I was told that the original damping material was some sort of “JUTE”,- very hard to get but available somewhere in Austria. Jute tends to disappear after time somehow,- I did not think that this stuff was the right choice for rebuilding and refurbishing these speakers. I looked for alternatives. The material had to be flat (2cm max) and stay that flat, it should not have the tendency to loose its form and stiffness for it is mounted very close to the backside of the panels, almost touching the back dustcovers. It should have the same acoustical damping like “JUTE” and should be able to be glued somehow to the back grille.

14.04.2002

A friend of mine had the solution right there for me, he works as a service-technician for air-conditioning-machines in the Berlin Underground-Metro.

There they use filtering material that comes in different thicknesses, masses and widses. I got two pieces of filtering material that is about 2cm thick, has a soft and a more hard side (in fact the material gets more and more tighter woven from one side to the other),- that seems to be ideal. It is made of some chemical fibres, feeling like cotton. I cut out the forms and glued the pieces to the back grille with “hot-glue” from the outside inwards so that the glue went deep into the fibres to stick real good.



my new damping material,--glued to the back grille of the QUAD ESL.

16.04.2002

I found feet for the units in eBay. The speakers had to fit into my living room and therefore they should not be lifted so much in height. I looked for feet that would lift the speaker for about 20 cm, not very much more than the original feet. They should be black and of sturdy construction,- they also had to fit somehow into that 60s / 70s- design of the speakers.

I found one pair designed by a German manufacturer of the 70s / 80s. called "PFEIFFER". I got them for 6EURO!



don't you think that these feet really fit to the QUAD-design? The speaker can be screwed on them and can then be tilted into several directions.

18.04.2002

4 weeks had gone by. Still waiting for the Mylar, (unfortunately there was a delay) I decided to get the dustcovers for the treble panels ready. First I wanted to use 4micron Mylar for these but I found another solution that was much cheaper and turned out to work very good.

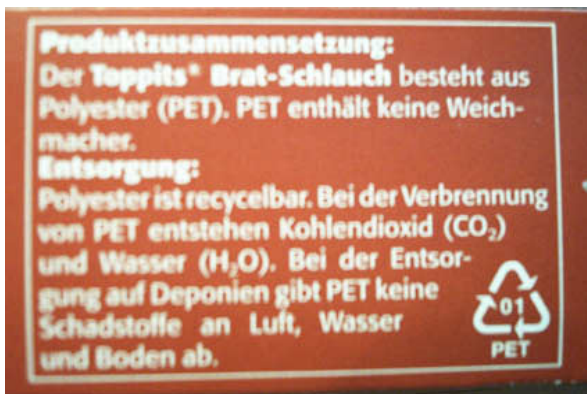
There is a manufacturer called "Toppits", producing PET (polyester)- film of the app. thickness for kitchen-use. In fact this is called "Bratschlauch" and you can use it to bake meat in it. It behaves and heatshrinks like original Mylar, it even looks like it (greyish shimmering). A roll of that foil (much enough to provide 3 treble-panels with dustcovers) is about 1,5 EUR over here,- so I tried it.

Before I could glue the foil onto the frames of the dustcovers, I had to drill holes all along the wooden back frames. These holes will take the screws that will stick out of the treble panel after rebuilding. The rivets are flat and therefore fit into the cavities that are in the wooden frames, the screws are not.

Look at this,- the holes must be according to the holes in the electrodes:



I then flattened out the baking foil on a wooden plate, stretched it with tape as much as I could by always halvening the distance between two strips. Then provided the dustcover-woodframes with double sided sticky tape and glued them onto the foil. I cut out the hole thing and,- there they were,- readymade dustcovers, looking like the original. I will heatshrink them after mounting with the panels.



this stuff makes nice dustcovers for very low costs,- is it real Mylar? Does anybody know which PET-product stands behind this?

20.04.2002

In the meantime I did also some restoring of the black front grilles. I tried to bent out all of the bigger dings and also repainted the whole grilles with shiny paint in cans. The grilles came out nice and looked not new but very acceptable for me.

05.05.2002

The long awaited Mylar arrived and I was ready to make the last step,-refoil the treble panels. To make the restoraton as close to the original as possible, I decided to use the 6 micron Mylar for the panels. I will not describe every step of the whole thing,- there are lots of articles out there in the web, doing that.

I glued the Mylar with double-sided sticky tape to the stators to be shure that I can start over again when anything went wrong, I tensioned the Mylar by applying heat from a heat-gun and used dissolved Nylon as a coating on BOTH sides of the foil. I used 10mm screws and nuts for reassembling of the panel and vacuum-cleaned the whole panel before wrapping it with the dedicated dust-covers.

I melted 4 holes into the dustcovers to reattach the felt-washers through the panel,- other refurbishers state that this is not a must.

I then fitted the panels into place, here it is essencial that care must be obtained not to rip or puncture the dustcovers while inserting the panels. There are tricky little staples looking out of the back wooden rails holding the treble panels that can easily puncture the foil by accident. These staples will sink into the wooden frames of the dustcovers when the panel is properly aligned. I connected the panels to the audio-transformers soldering posts referring to the schematics.

Most of the restoration was done by now, I just had to reassemble the whole speakers together, the back and front-grilles had to be attached,- all wiring was inspected once more, all of the dustcovers had to be tensioned by applying heat. This step came out very fine,- all the dustcovers had a real professional look after being tensioned.

This is how the panels looked like when installed, wired and all dustcovers tensioned:



06.05.2002

Almost 2 month had gone by since I bought these speakers,- now it was time to see if I did all things right. They looked great,- all new painted,- really nice! I hooked them to the mains voltage, connected my 303 amp and gave them 4 hours to charge the diaphragms. I positioned the speakers to fire slightly inwards right to my ears, maybe 3meters from each other and also 3meters from every speaker to my seat.

The first recording I heard with my new QUADS was "Eric Clapton`s UNPLUGGED" CD.

I was instantly amazed about the clearliness and the uncolored sound of the voices. Against a lot of statements I read in the web,- they produced much enough and very well tempered bass.

But the most amazing thing with these speakers is the absolut faboulous soundstage they produce.

Clapton`s Band was playing in my room,- left and right of the speakers there was 2nd and 3rd guitar,- the piano played far behind the back wall of my living room and Mr Slowhand himself sat slightly right from the middle of the centre 4meters away from me,- direct IN MY BOARD. The speakers seemed to be absent they just leave the music there in the room. I did some tests with the positioning of the speakers in my room but after all I came back to the figuration I had first. I will have a lot more of listening in the next time and looking forward to hear my favourite Cds with the new sound. I am shure that I will have lots of fun with my new speakers and assume the whole work worth every minute and every drop of sweat.

In the future I will rebuild the 4 bass panels one after the other, so that the whole system will be completely refurbished some day. Although all 4 bass panels work,- they are at least 40years old and so is the coating on the diaphragms. Freshly coated ones will perhaps sound better and last longer than these.



the CD I first listened to,- very very amazing,-beautiful soundstage.....



everything ready and working,- left and right speaker in my living room...

Without the help of many people,- especially people being kind enough to share their experiences with others and giving their knowledge to the web,- I would have not done all that restoring and rebuilding of these fine speakers.

My special thanks go to Mr. Peter Walker for building that great piece of hifi-equipment,- Mr. Shedon Stokes for his help and for sharing his knowledge with the web-community, also to Mr. Stewart Penketh and Mr. Andrew King for their support via their websites and great articles about the refurbishment of QUAD-speakers. Many thanks also go to Hans Zeeuwe for his support and help, especially regarding the search for parts like the Mylar.

If there are any questions concerning the described work,- please do not hesitate to email me.

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