The beautiful Quad ESL 63 electrostatic loudspeakers

These units are famous. They has been 'planned' very early, but got actually pretty late produced in 1980 They have been in production for 15 years or close. Many units were build and if you are looking for a pair, you should go for a pair with a high serial number which is in fine condition. I say fine condition as electrostatic units have to be treated very well, and I don't mean electrical.

Buying a pair is no sinecure. This is why I usually don't do electrostatic loudspeakers as they always end up bad when you have them at home.
This leaves two ways of getting a pair of electrostatic loudspeakers. The first one is the easiest one and that is buy them new. But they come ate a price which is quite above an average wallet. The second option is to buy a pair second hand and rebuild the panels. This is what I did when I got this pair of quad electrostatic speakers. I have done two sets of the esl 63 about 15 years ago. (they had torn screens) and I remember getting materials out of australia, or down under. So when I got another pair I had to dig into old notes, finding my source of materials back then. One cool thing is that they still exist today and still going strong for 30 years.

Not amazingly due to the very friendly people (Jan and Rob) who are there to provide you with the best and friendliest help down under' s got to offer. Nowadays things have changed a little to the good, better materials and glues. I gave them a call and got Rob on the other end. I ordered the ESL 63 repair kit and we spoke a while, while he was preparing dinner. With 230 euro, including postage, actually quite cheap to recreate a dream speaker system.

Cheers to Perth, Australia, or down under as we use to say, to E R Audio Pty Ltd. !
Web address: http://www.eraudio.com.au

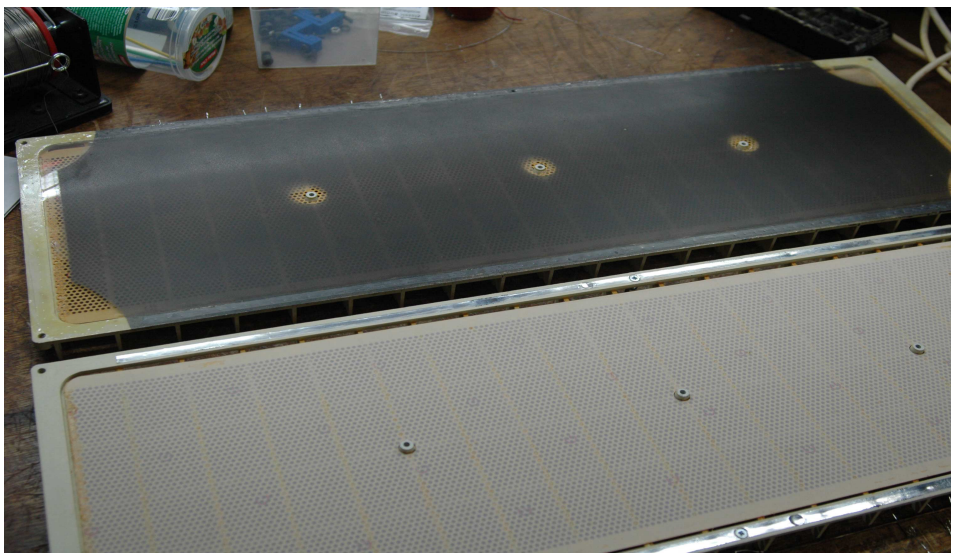
I stumbled on a pair. Serial numbers 8267 and 8268, early ones. Later units have some modified electronics but remember that any esl 63 can be lifted to the latest standards (if man would want and can afford that). I have bought these particular units from the first owner, a sound technician who has worked most of his career at the Wisseloord studios in Holland. It is amazing to see in what condition they are. The foils did suffer very minor from humidity. I don't know exactly how old they are. All original units with crosby grills. Now, this all does sound good ? Yes and no. One unit was sissing, the other made some rattling noise. The sissing noise was easily fixed by fixing the stators back into position on on upper base panel. My little Cabasse PAS-10 amplifier is having difficulties with them. Funny as it only produces 10 watts each channel. But the sound that is coming out of these units is not bad. To be more precise, I remember them exactly as I hear them now, funny again. But then they are 100% original and they have been at a very careful owner. However, when I connected a big amplifier the signs of wear were showing. Nr 2 has got some problems with its input board and perhaps the EHT circuit. So … I started to disassemble Nr 2 to see how the condition of the diaphragms were. I started with the one that made the most noise … only to find the lowest module in about the same condition as the upper module, good. This is a good sign. If all the modules are like this I can clean them up and hopefully they last for another long period. If you clean them thorough, including all the electronics and remove all the build up dust, you can enjoy them again. One thing of importance that is so often overlooked or, not done, is to replace all the solder lips on the EHT line. Most of them are like a cookie. Bending them a little is enough to break them, hence the influence of EHT on bend metal.
(Tip: Bend the lip after heating it up with your soldering iron and let it cool down again before mounting and soldering)
Solder the whole lip up to the screw, but not the screw itself as that would put too much heat on the panels. They would melt.

Here is one panel opened up. The diaphragm panel is the upper one, the lower panel holds a very thin fabric which must be treated with care (!).

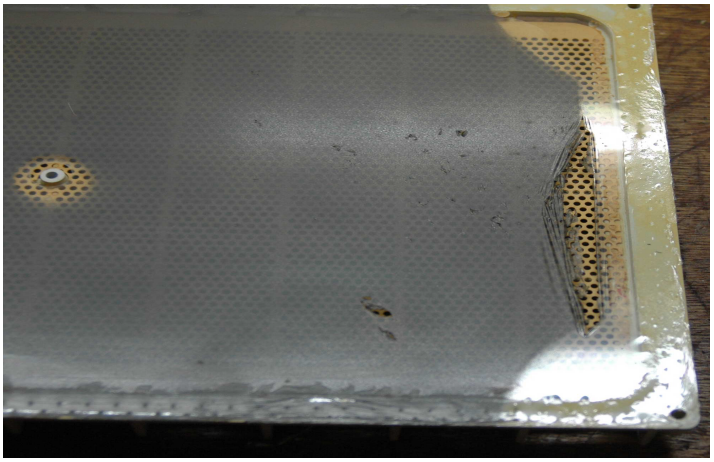
Though the diaphragm looks fine it has its traces of electrical and mechanical wear. In other words: holes in the diaphragm.

The glue that holds the stator plates suffered from aging. This meant a complete disassemble of every panel. There is no other way of reparing them.

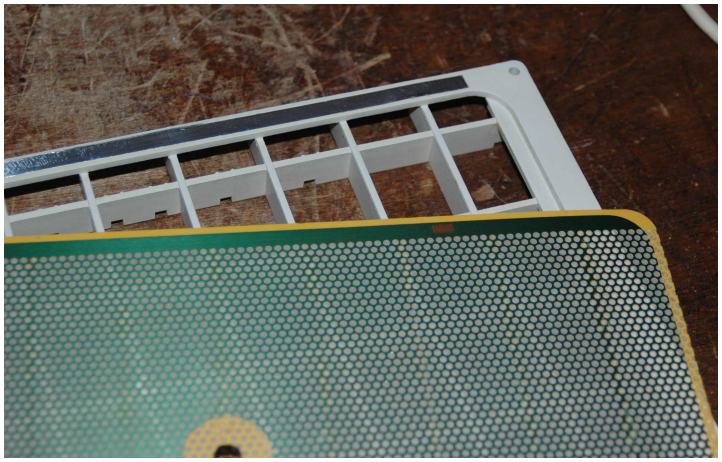
Unless you bring it in for service by Quad, but that is quite expensive. ER Audio's solution is very nice priced, but above all, very complete and detailed.



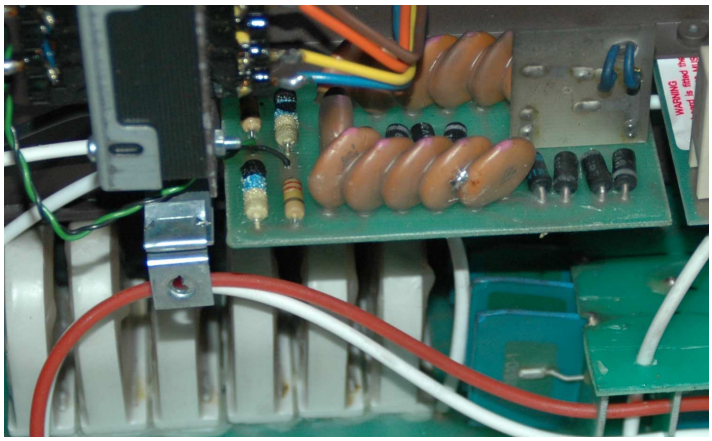
Okay, Nr 2: It seems that only the popping sound is there now. Scratch noises are gone. I will open up the upper mid module and see how that one is. Erhm, Nr2 is kaput. Two torn diaphragms at the corners, too far to repair. Not only that, more stators came loose due to the "test" I did. This is the well known sign of the aging, original, glue. So, (very big sigh..) Yep I can rework all panels. This means disassembly of the 8 panels, removing the diaphragms on all panels, removing all the stator panels. Then I will have to remove every bit of residual glue of the matrix panels. Also I have to clean every stator (16 of them). Cleaning stators must be done gently as it is a pcb (printed circuit board). I use just a heavy towel to rub the glue of them. Inspection takes a long time before they can be glued back into position. Working straight and clean is a demand. Be oh so sure that the stators get back flat onto the honeycomb panels. Residual crap cannot be tolerated here. Getting new diaphragms on isn't really that hard. Everyone has got a door in his / her home, I mean an indoors, flat surfaced, door. Lift one out and there you have an excellent working and tensioning area. It is WAF friendly as long as you don't write or draw on it.



Above: Et voila !
Here is the culprit of the 'sizzling' noises. A torn diaphragm at the far side(s) of the panel could go worse when played loud. It will either tear trough or not but .. kaput it is. There is .. No way of repairing this



Above: Working clean means getting rid of every bit of glue and other things, on both the matrix and the stator plate before you wash the matrix. The stator plate is just a big piece of Pertinax printed circuit board. Pertinax has its very own odor. Be very gentle with them as they are prone to break easy !

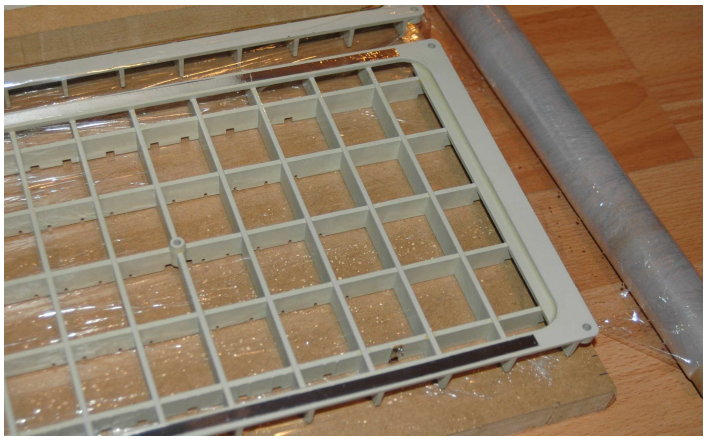


To the left:
This is a detailed picture of the EHT board (Extra High Tension).
Any place where reasonable high voltage lives is prone to certain conditions that are not valid for normal appliances. Clearly visible is the white cristalization upon the resistors to the left on the board. This, together with dust which smells like ozone, has to be removed. But before you start pulling of your dustcovers, you should already have washed the dark grey dust of them. It is not possible to use compressed air but please do it with water and soap. Wash all the dust away since it is quite bad for your health.
If you don't wash a dirty unit you will get that crap all over you. Only a shower will help.

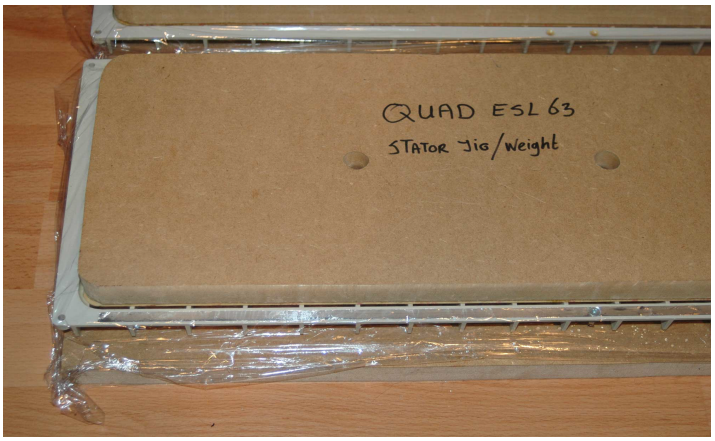
Rebuilding the EHT is always a good idea.

I always do two panels at a time. This means that for 8 panels you'll have to tension the film only 4 times. I have done the delay-line units on one channel first to see how they perform in comparison to the original. (Actually they are not the same since the new film is thinner, and new). To do a pair of panels proper: Remove the three bolts and nuts. Remove all the clips on the outer edge. The panels can be separated now. If you are not going to re-diaphragm, be very careful to separate them as the diaphragm on old panels can come loose very easy, thus ruining the panel. In my case I am going to renew all the diaphragms. Make a photo, or draw a jig so you know where the conductive coating is on the screen. Remove the diaphragm and scrap away all the excess residual glue. Next is to desolder the contact points. I have professional tools to do this but if you don't have these, get some desolder wick. Don't leave any solder on the contact plates, this ensures proper contact when its going to be soldered again. You can either remove the contact plates of the modules to clean them. Be careful to remove both the stator boards. Those are made of a material like pertinax. They produced early printed circuit boards with this material. If you have a good look you'll notice that the stators are nothing more then printed circuit boards. (which comes in handy if you want to make one yourself). When the stators are separated from their matrixes there's only one thing to do, and that is a proper removal of all the crap and residual glue. A hard, plastic, scraper works very well. Use a wooden scraper to remove most of the glue on the stators as plastic could damage things. Ok, now everything is almost clear, except for de-greasing. We have a friend, a good friend in our world. and that friend is acetone. Get an old and clean t-shirt. Dip a little acetone and you can easily remove the last bits of glue, leaving a perfect surface for glueing. (note that I do not use any form of sanding paper). I use a good, flat, potato knife and remove any old glue on the matrixes. When that is done it is time to wash them. I use warm water with a little soap. Rinse them well with warm water (under a shower works great). You can air dry them but I actively rub them dry. Do not wash the thin stators itself. First we have some inspection to do here.

Seek for any black, or dark, spots on both stator panels. You'll probably find a few for sure if it has been used heavy and loud, but that's normal. You'll find them probably around the solder connections. If you encounter them in other areas you'll have to clean those areas very as well (which sometimes is a bit of a pain). On the solder connections, the flux in the solder could have filled up one or more holes in the stator panel. This is asking for problems in the long term. Clean that hole with a toothpick. Then some cotton stick with a little acetone will remove the rest. Be careful with the toothpick on the stator with the fabric on it. It is easily damaged. The fabric and acetone are not friends. I usually run a hot soldering iron over the outer edge to get rid of loose ends of the fabric, if it has any. It will nicely melt away. Run the solder iron swiftly over the outer edge. Black spots are burned areas. Just like lightning works, this system can produce a spark between the stators and the diaphragm. In the dark this can be visible. If your system is sparking with panels in fine condition, you're experiencing electronic problems in the spark-arrest circuitry. Though due to their age it is much more common that just the panels themselves go bad, bad due to the glue that is hardening and becoming brittle. This also affects the sound over the years but most of the time for the better.
All difficult things so to hear but everything is solved when you rework all the panels in to new status. It will not sound the same but it comes very close to what you had. I specifically say 'had'. The old diaphragms have suffered from mechanical and electrical stress. All to the bad of the sound. New diaphragms will present you with broader dynamics. It has also got more punch. The best thing to describe the difference with the ER solution is that the 'haze' will disappear, leaving you with a cleaner signal. Therefore it can be said that you don't really compare old vs new as a torn diaphragm will cause voltage leaking. Bringing them in for service to Quad will cost over 1000 euro. The question I have asked is how old the replacement panels were. The answer I got was 'unknown'. This didn't satisfy me as I don't want new panels that are in stock for a couple of years, or more. Basically this made me pull to Jan and Rob. They are active in the electrostatic field for over a very long period. It also turned out that in my old notes the place to get materials was ... Australia.

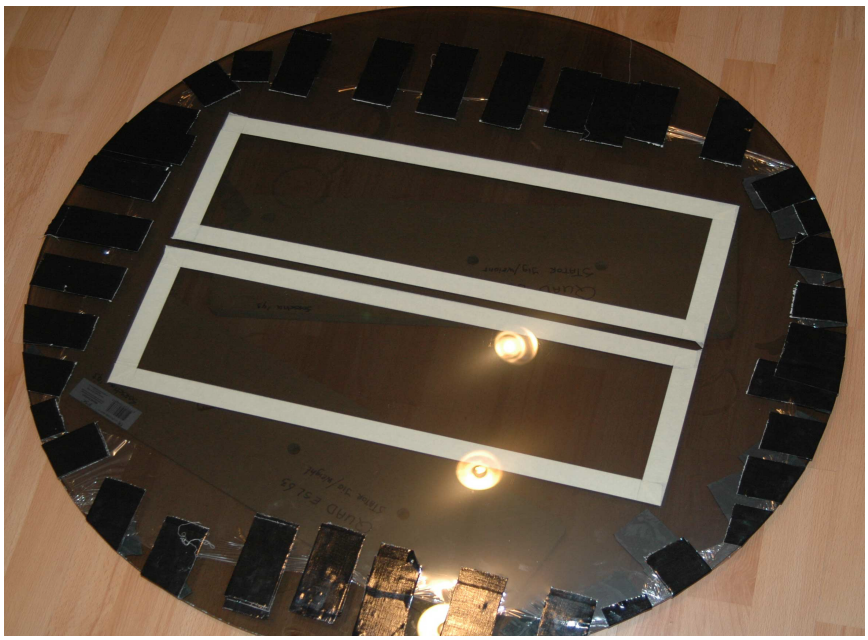


Matrix panel, as clean as a whistle, ready to receive the stator plate. The glue is barely visible. I have not used the roller(s). Instead I have used a small, strong brush to give the matrix a very thin coat of the brownish urethane glue.



Something I made long ago: two 24mm MDF jigs with exactly the same size as the stator plates. One side has been 'upholstered' with wool to provide even pressure. Be SURE to use kitchen film between the jig and the stator plate. Let it dry for at least 24 hours before removing the weigths. (in my case the jigs)

When everything is clean and proper it is time to use the manual of ER Audio as precise as is up to the point of tensioning and glueing the diaphragms. When you are that far to place the diaphragm film for tensioning, I would stop here and add a little handy but important thing. The addition consists of some paper masking tape. Tape three or four layers of tape, but end up with equal thickness, on the area that you are going to tension the film on. (see photo below) Doing this lifts the film a little of the surface. When laying down the panel you'll notice that it doesn't wiggle anymore. The panel has a good and firm "base" for the film to press on with the masking tape under it. Adding weights is enough. The reason for this is not to put stress on the plastic structure. The centre pinholes are slightly higher than the outer edge (!) You will get a very nice bond between the film and stator panel this way.



Here's my solution:

Instead of ripping a door out of its posts, I have a round glass table that I don't use anymore. Visible is the table with a tensioned film on it. The rectangular shapes are the four layers of masking tape that is on the glass. The film is tensioned over it. These rectangulars are the exact shape of the esl 63 panels.

The four layers of tape provide a cushion for the matrix to lay on. The three center holes are slightly higher than the rest of the matrix (!) This layered tape provides protection for the center pins, but above all, an even pressure on the outside, right where you want it to be.

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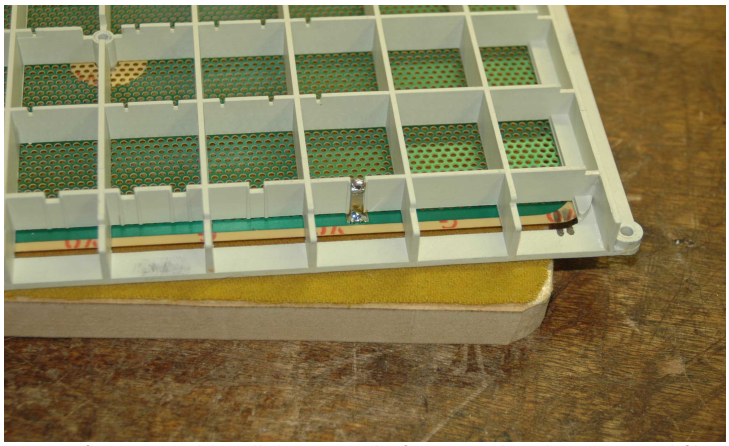
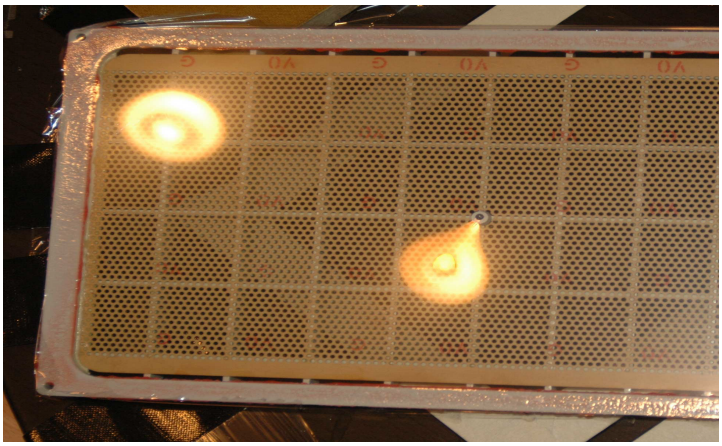
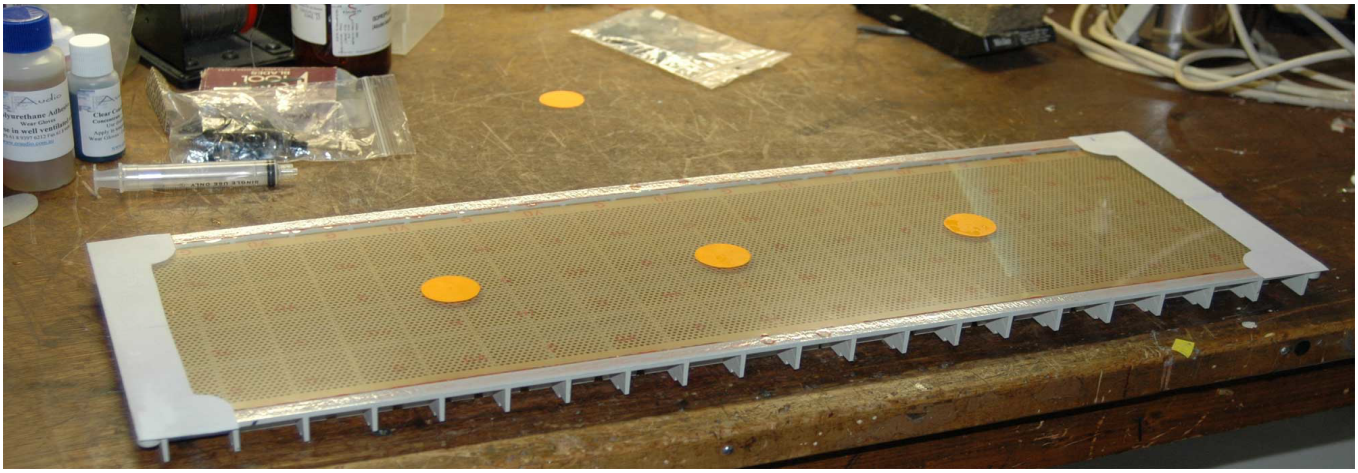
The panels need "break in". This means that the conductive coating needs time to cure completely, which can take up to two-three weeks. When assembling and haven't done cleaning yet, you'll find old foam tape, remove it. Please run a fresh piece of it over the full length of the sides. Also, since we don't like airgaps in the baffle, Place a thin, small rubber strip between the four panels when you mount them. Since the electrostatic loudspeaker really is just a speaker without a baffle. one electrostatic panel is its own baffle. Four together is still one baffle. No air gaps allowed in between them, preferably.



Do not forget to solder all the pins ... before you glue the tensioned film



A fresh film, 24 hours after glueing. Now man can clearly see that the center posts are higher than the outer edges.



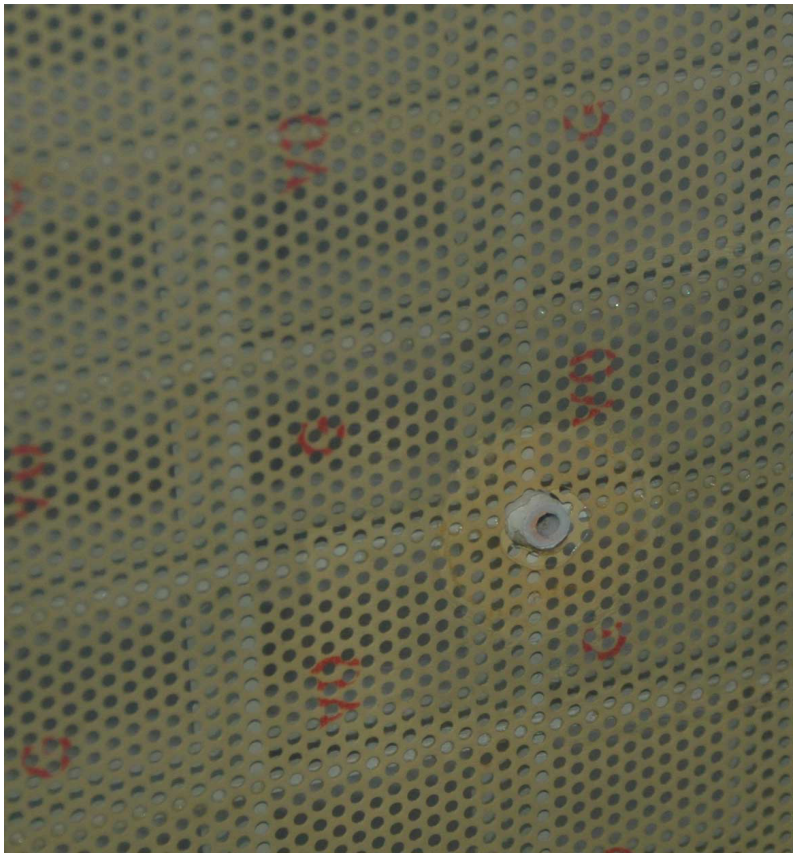
The above photo shows the acetate jigs that are on the film. (white and orange). The coating has already been applied and it's about time to remove the (reusable) jigs, or templates.

Perhaps a bit difficult to see, but around the center hole you should notice a more 'yellow' spot. This is the film without the conductive coating applied to it and where one of the coating-jigs was attached.

The description of a blue 'haze' is quite correct, though it shows a bit towards grey. If you can see uneven spots in normal light you can bet you didn't apply the coating even. I went wrong two times. The first time, and the second time I dropped the applicator onto the film, Like: 'He slipped in the bathroom'

The conductive coating needs drying time though it will bond very fast, and also dries very fast .... but do not attempt putting a fresh coated panels under high voltage. Leave it for 24 hours.

This counts for all the glues used in the kit. Give it time to dry completely and do not get into a hurry to finish them. The most important issue on this whole project is how you good and even you can apply the conductive coating. The tensioning of the film is also important but there's no hastyness involved, as with the conductive coating there is.



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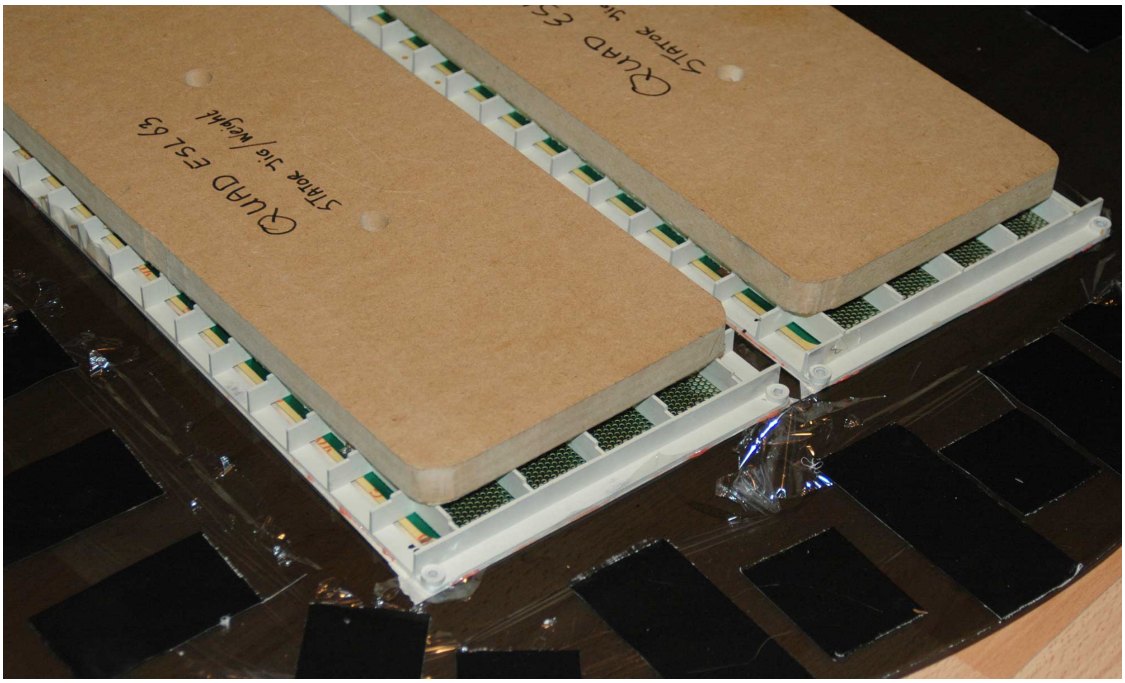


To the left:

A larger photo of the process of glueing the film to the matrix. This is 24 hours after positioning the matrixes onto the film.

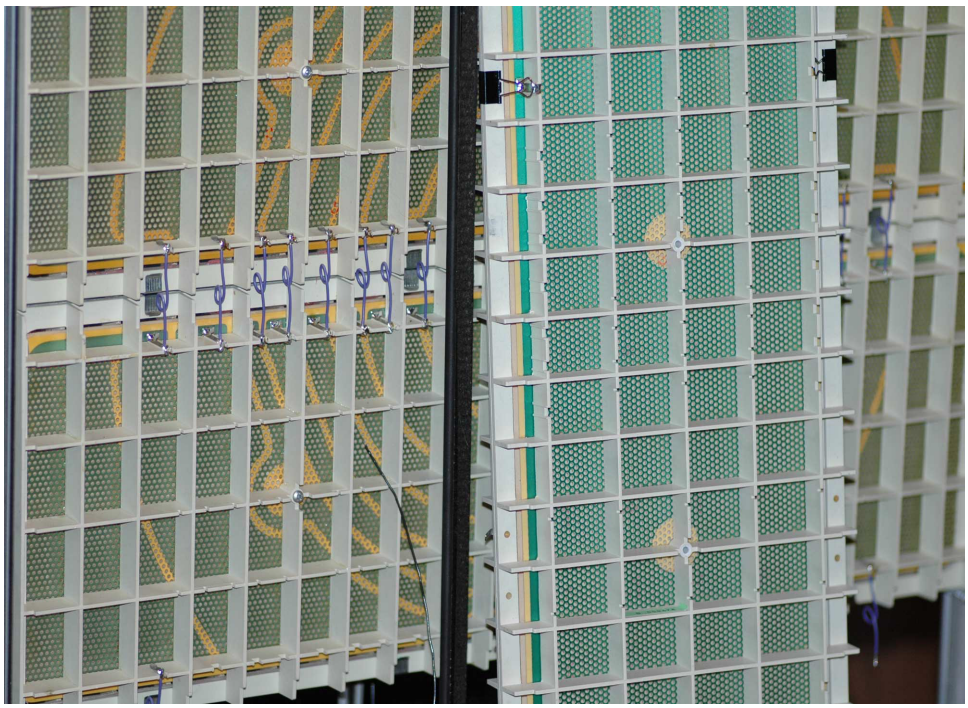
A sharp, surgical, knife has been used to cut the surrounding film loose from the panels.

To the right:
One panel is resting against its framework. The panels behind are already finished. It is waiting time, waiting for the glue to arrive from Down Under.

My little bottle of red urethane hardened in about a week in its bottle. Argh ! I'm not finished yet as I'm a precise guy that has done the 'firing line' panels twice to get the best, even, results.

ER Audio just has proven itself by sending of a little bottle of red urethane to finish this ESL 63 project. Is that a service or what ?

(I think it's a wow)



21-02-2013:
I have given the new panels the time to 'settle down'. There is absolutely no lack of bass and it gained the 'some feeling of lost' detail in this period of time. It is now time to rework the last two bass panels. As a matter of speaking I am halfway of one panel. I have waited with the last two panels to see how the other, new, panels 'blend in'. In this period of time given to settle, the two 'old' bass panels in question just cannot coop with the other panels. They are now a disturbing factor.

March 7, 2013:
Bass panels have completed. The units are now homogeneous again. It is time to 'break' them in.

I have found that if you apply a little bit more of the hrc-fluid, it presents you with a bit more bass. When done too thin it pays of with a lack of bass. When done too thick, the whole system will 'bleed', (noticeable by audible lower output) and will sound "dark".
The amount of conductive fluid needed, specified by ERAudio, is exactly correct, about 2ml for the first 'run', and about 1,6ml for the second 'run'.
The applicator will take some of the fluid to soak, but only in the first run.
(first run is the first panel you coat, the second run is the second panel you coat. I always work in pairs)

I think I'm almost there. The things needed to do is to:
- Disassembly of the two units,
- Cleaning them
- Renew the socks
- Rework and Rewire the EHT section.
- Re-assembly

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There has been a few weeks after the rework of the last two panels. It turned out that both panels were leaking high-voltage over the input connectors. I already found it strange untill I noticed that the air was 40% humidity (!) This is not good for a fresh rework it seems. So I decided to put them away for a while, keeping in mind to redo the last two panels. However, the humidity is back to normal level. So .. why not trying them ? With 220Vac applied to them and switched both units to on I was expecting to hear some hiss from the upper panel. But they were both as silent as can be. Well well, I switched both units to off and connected them to the Electrocompaniet AW75. The Cabasse pas-10-T-10 as preamp and phono as input. Who was saying that they don't produce enough low output to really move you ?
Here are the results after overhauling with the ERaudio materials:

I did not know that they can go that loud . The 3d imaging is, if you did it right, absolutely fabulous ! Not only that, own recordings really let me hear the hall, room, or chamber. Good recordings from the seventies are a joy to listen to. Which brings me to nowadays music and recording. You can play any type of music but don't expect them to rock the cradle. If you want that, just add a small but fast subwoofer. This will fill the lowest 'gap' that the esl63 lacks. Modern music clearly let you hear the crap, or compression, distortion, name it. Actually if a recording is kinda shitty, it will sound kinda shitty. (Like: Is this it ? Did I pay so much money for this ? are comments I have heard, and liked).

So, how about the total solution ERaudio has send me ?
One word:

Wow !
(can I become a dealer for Holland ?)

I have something noticed something strange about the latest Quad esl models .
I have had the pleasure to listen to the 2905 model.
The power amplifers used were the AW75 (proper) and a Parasound, which was way overkill. As source we had 'some' home cinema amplifier which used its pre-outs to drive the power amp. Secondly I brought my SP8 with me with a couple of 'certain' recordings which are very familiar for me.
To keep the story short:
If I have to choose between a real pair of ESL63 and the 2905, it would be the ESL63.
Though the power capacity of the 2905 is 'room shaking', as we played really loud that evening, the 2905 could not catch me, neither the owner. They have something that . . better to say is that they are quite off from the original design. I happen to know the 989 very well. My ESL63, reworked with Jan & Rob from ERaudio, is producing much more warmth and detail compared to the 2905. Besides that, there is a lot more depth in the music. Something I was missing in the 2905. Now,
we blamed the preamp. Ow, I said, what we can do is connect Stella to my passive volume control box and then right into the power amp of choice. So that happened. 'Dying to be a ghost' from Caspar, was quite impressive. The output of the 2905 is about equal to a good pair of 989. The sound image was still flat, or undeep ? Other songs were good but still there's something 'wrong'. Right, another attempt. The AW75 with stella directly. Still no change so it has got to be the 2905's. It may be my personal flavor but depth in the image is more important to me than anything else. The difference between the ESL63 / 989 and the 2905 is just too big. The word I am looking for is charm ,or perhaps soul, that the 2905 's missing.
I am very well known with placing them and, even in my small living room with the ESL6 the 3d is there, as you'll really get caught by the music.
But who am I ?

Errata:
I would like to hear the 2905 in a larger room to really be objective. But the difference was too big
I still have the idea that they 'somehow' are aligned for compression ? Like MP3 or digital alikes ? (perhaps worth investigating)
They have been produced in China. (afaik: only series one and two are original quad. Judged and build by english ears and standards !)

If I were you who's reading this, Go for a pair of ESL63 and restore them yourself. It is much cheaper, the result can be spectacular but it depends on the quality. You'll need power but really, a serious 50W power amp is sufficient. The AW75 is 75W. But it can deliver up to 80A at the output, which is kinda serious. However, I was shocked over the fact that an old, but very nice, Pioneer sx828 produced such an overwhelming sound which I just had not expected. It had no problems whatsoever driving the ESL63, loud !
I think renewing your ESL63, 988 or, 989 with Jan & Rob's utter complete kit of materials is a one of a kind winner for all of us !
Cheers !