

CHAMP ELECTRONICS - " THE VINTAGE VALVE AMP HOSPITAL "

NOTTINGHAM, ENGLAND

THE CONVERSION OF AN EL503 TUBED FBT 1200R AMPLIFIER TO USE PL36/EL36 TUBES

- BY GIULIO MAIOCCO, ITALY



John:

"Hello, over a few months I have become quite friendly, via e-mail and a few phone calls with a gentleman in Italy named

Giulio Maiocco. It would appear that I inspired the following article, written by Giulio, about an EL503 to EL36 conversion. I offered to place this article on my website for him, along with the photos. I hope that you all find it just as interesting as I did."

Giulio:

"Hello all! This is a little history about what inspired me to modify an Italian FBT amplifier.

About a year ago, a guy took this FBT amp to my friend's musical and vintage shop. The owner of this amp left a message on a paper "stick-on" asking for some odd noises and other issues to be fixed. Seeing the brand, "FBT", I almost instantly suspected this amp used old and possibly rare output tubes, and I was hoping that there were no EL503's in it?

As soon as I opened it and saw the 4 x EL503's (Doh!!!), I yelled some coarse words! Three of the valves were very dark and not so good looking; the last one was missing the getter and had a milky appearance... Huh, not good!

The under-chassis was no better; two wire wound resistors were burnt and broken in half, another two had become so hot that they had melted the solder on the tags they were soldered to, and the bias supply filter capacitors were cracked at the seam. No surprise then that the amp was making strange noises!!

As I explained the problem to my friend, it was clear that it was not cheap to have it fixed. Visiting EBay to find the average price for these tubes indicated an estimate price for the repair of around 400 Euros. My friend phoned the guy telling him what the problems were with his amp and the estimated price to have it fixed. Unexpectedly the guy gave the OK to proceed! After further numerous searches on EBay, I came to the conclusion

that these tubes are either too expensive or virtually unavailable. They cost about 200 euros for a duet, and as I needed two duets, nothing of the estimated price would be left for my own work! In the meantime, five or six months had passed, so I thought that I had better find rapidly a solution to solve this "little" problem?

I found John's website, by pure coincidence, on a forum I visit from time to time. There was a discussion about his [1000 watt valve amp](#), so I got interested and visited the entire site... WOW!!

As I found the page about the conversion from [EL503's to EL36's](#), a light went full on in my head! Finding PL36's (the 25 volt heater/ filament version of the EL36 family) here in Italy was a piece of cake for me, as I fix, collect, and use valve TV sets as a hobby. Rewinding the power transformer to suit my needs was not a problem for me either. Even in the remote event that I did find some cheap EL503's, there was the "future availability" concern to be inserted into the equation, so I went ahead with the decision to modify the amp in order to take the PL36 valves, if we can call it a mod.....we should really call it a reconstruction from the ashes.

First step was the power transformer rewind, and this was not a big hassle. One thing I didn't like about it is was that it was bordering on the edge of meltdown. While the transformer was down for the rewind, I also did the more obvious mechanical works to the chassis, like drilling the hole (10mm) to permit the anode leads to reach the top caps of the PL36's, changing the sockets from Magnoval to Octal, and adding a B9A socket for another pre-amp valve stage. I ordered the necessary components as there were a few that were not in my laboratory or the shop were I usually buy my stock.

It was a hard "fight" to find them... It took almost three weeks to collect all the components and still there were a few missing,

like the two HT main smoothing capacitors, the 4 x 1mH inductances (of which I ended up not using anyway as the amplifier turned out to very stable without them), and the 2 x 47K 3W resistors. Well, at least there were other things I could be doing in the meantime. So I started to do the chassis wiring, using the old method of the waxed cord to keep the wires in an acceptable order, and also I should say that I obtained a quite good thing to use with this. I found in the chaos of my lab a bakelite tag board, cut it to my needs, and used it to house the various components and the relative inter-wiring.

Talking to John, who is very friendly and helpful, gave me some ideas about the grounding order (and much help in many other ways too!!) plus.....the most important thing: support and encouragement! Slowly the amp was taking the definitive "shape". It took me about a month to finish it, as I had to do other work in the meantime for other customers.

On completion, I initially set the mains voltage selector on the amp at the 240 volt tap in order to relieve a bit of stress off the mains transformer. The voltages I obtained were all a little low compared to John's findings (400 volts on the PL36 plates, 173 volts on the screen grids and about -52V on the negative voltage rail). I set the bias at 27 mA each tube, and I had a very nice surprise as it sounds, very clean and very very loud!! Thinking about it, PL36's are tubes not designed for audio purposes, and I was and I still am very impressed!

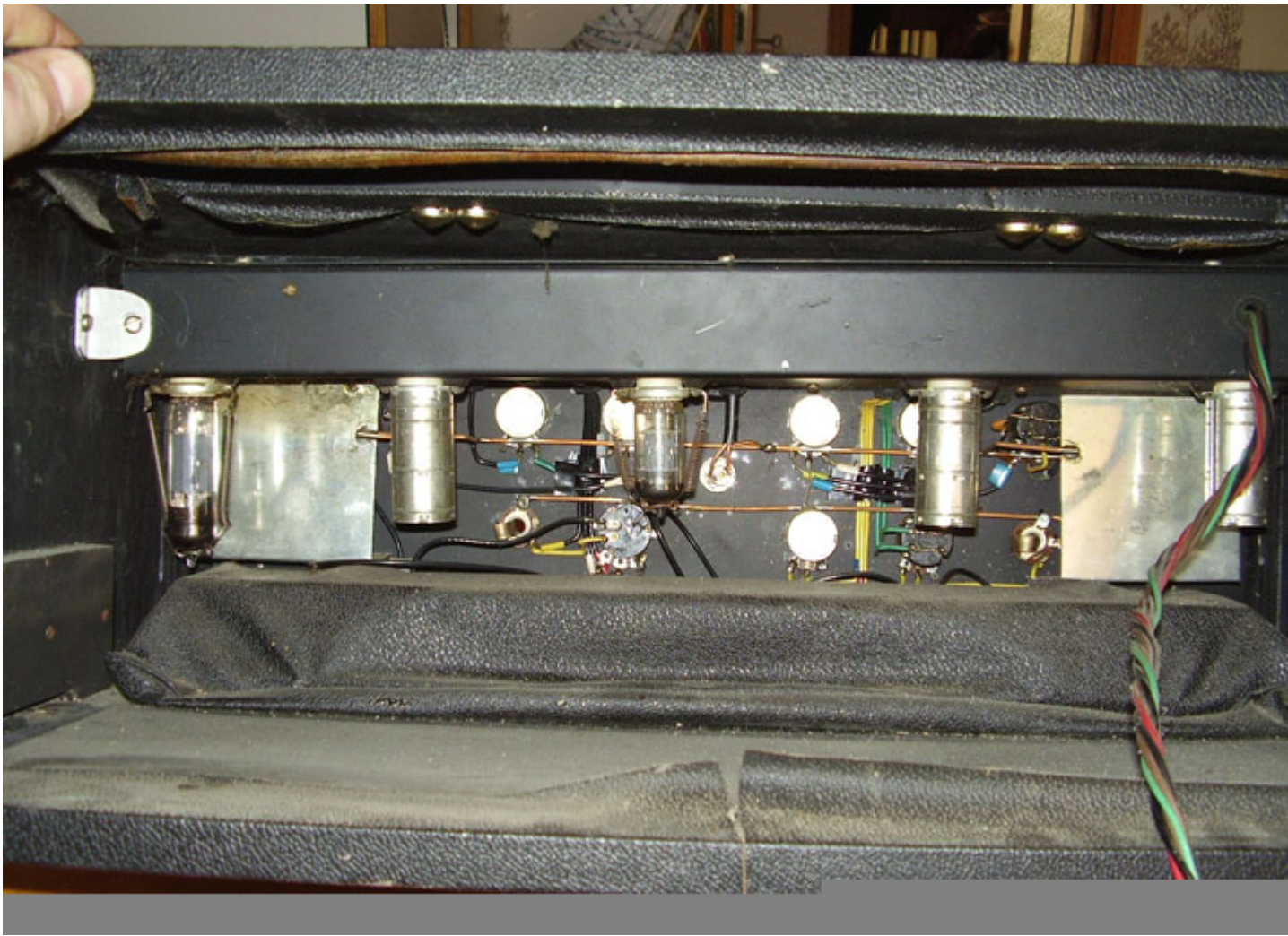
I had to take out of the dust my old oscilloscope, sine-wave generator (yes, both uses valves!!) and the 8 Ohm dummy load to see how much power the amp was capable of. Well, with this set of voltages, the sine-wave amplitude I was seeing on the screen of my scope was about 90V peak to peak, meaning the amp was pushing 126W RMS undistorted!! I decided to go for the 220V tap on the mains voltage selector which is actually the

correct setting for our Italian mains supply. The voltages this time were 435 volts on the PL36 plates and 185 volts on the screen grids with about -58 volts on the negative voltage rail which were now pretty much the same as John had suggested. A reset of the bias to 24 mA each valve and..... well, this time I was looking at an amplitude of about 100V peak to peak, meaning the amp is doing 160W RMS undistorted down to 40Hz!! Pretty good, especially considering that the original 4 x EL503's were doing 120W and, the PL36's are much cheaper than EL503's!!!

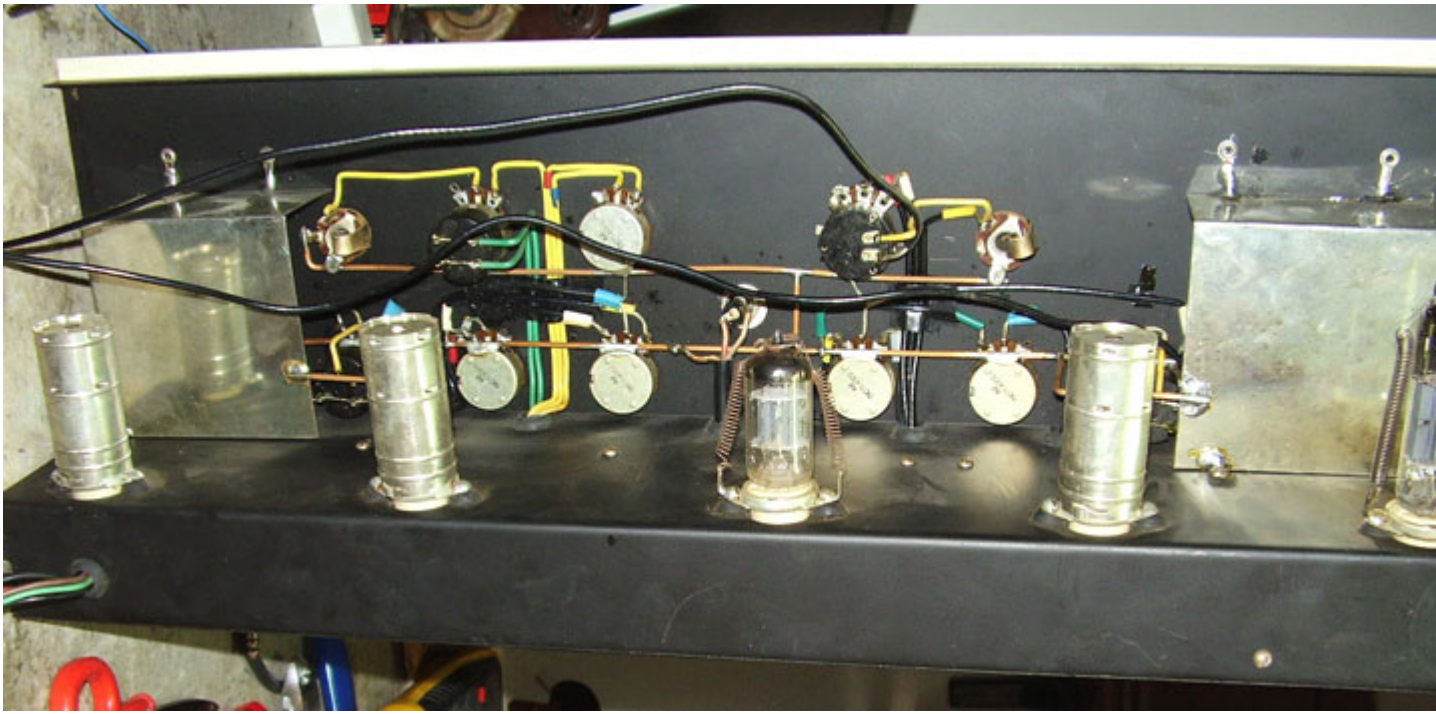
It was after seeing John's site, and especially his EL503 to EL36 modification, that inspired me to undergo this work. I am so pleased, impressed and happy with the results, in-fact so much so that I have already started collecting all the components, chassis and now preparing to wind the transformers to make his CBA-500 bass guitar amplifier! I will use 12 x PL36's in this one too.

In time, I will send the results, article and photos of this one too, as John has requested it for his website."

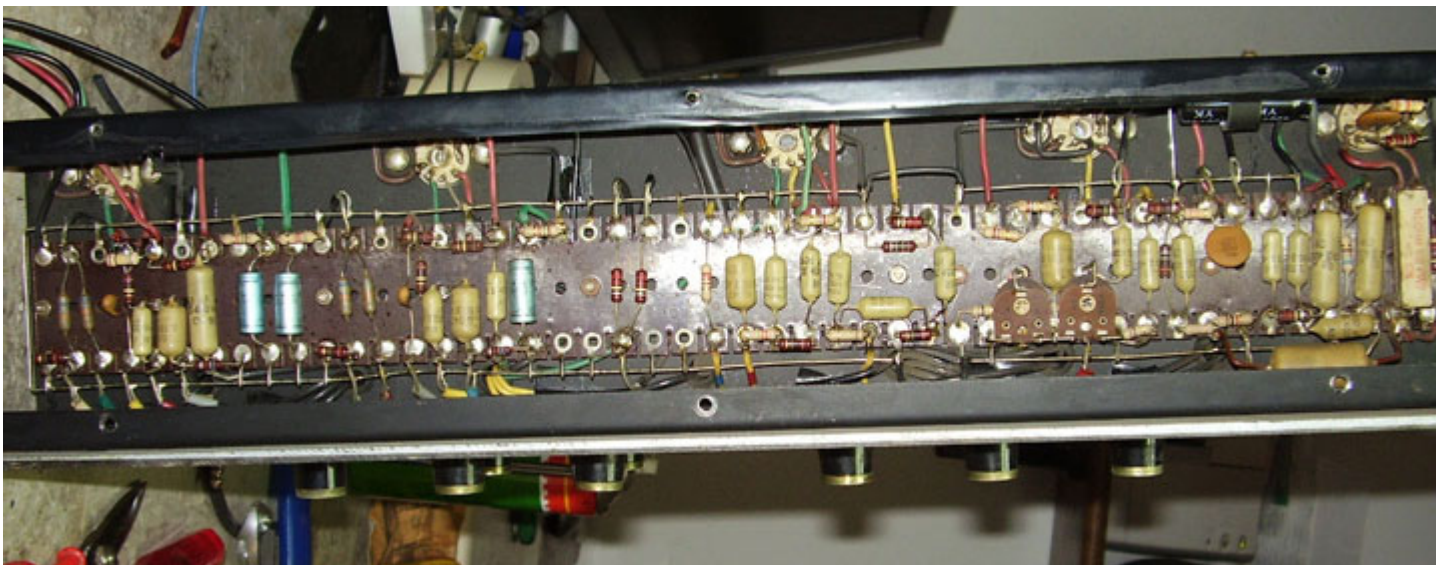
Giulio Maiocco.



Power amp section removed from the case, with pre-amp still in place.



Pre-amp removed from case.



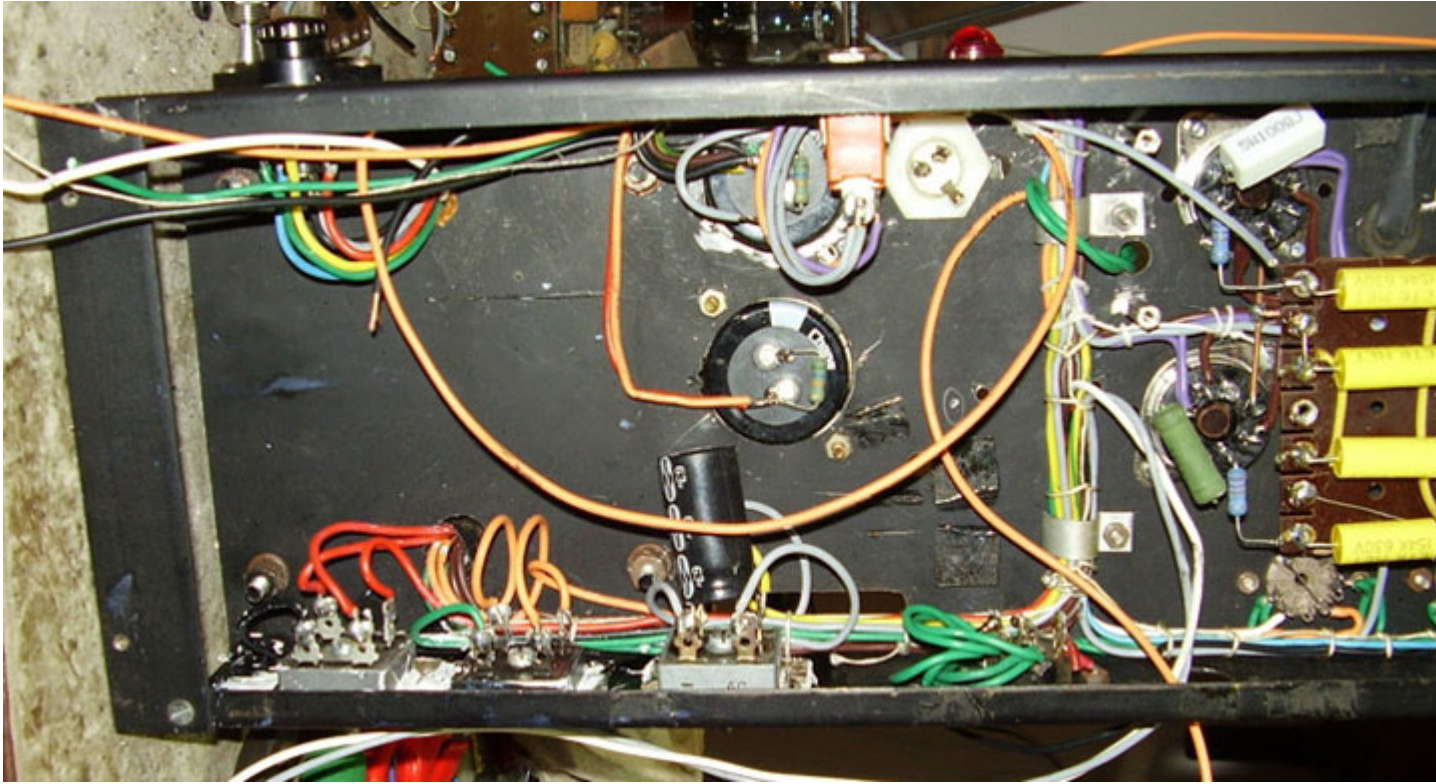
Underside view of pre-amp section.



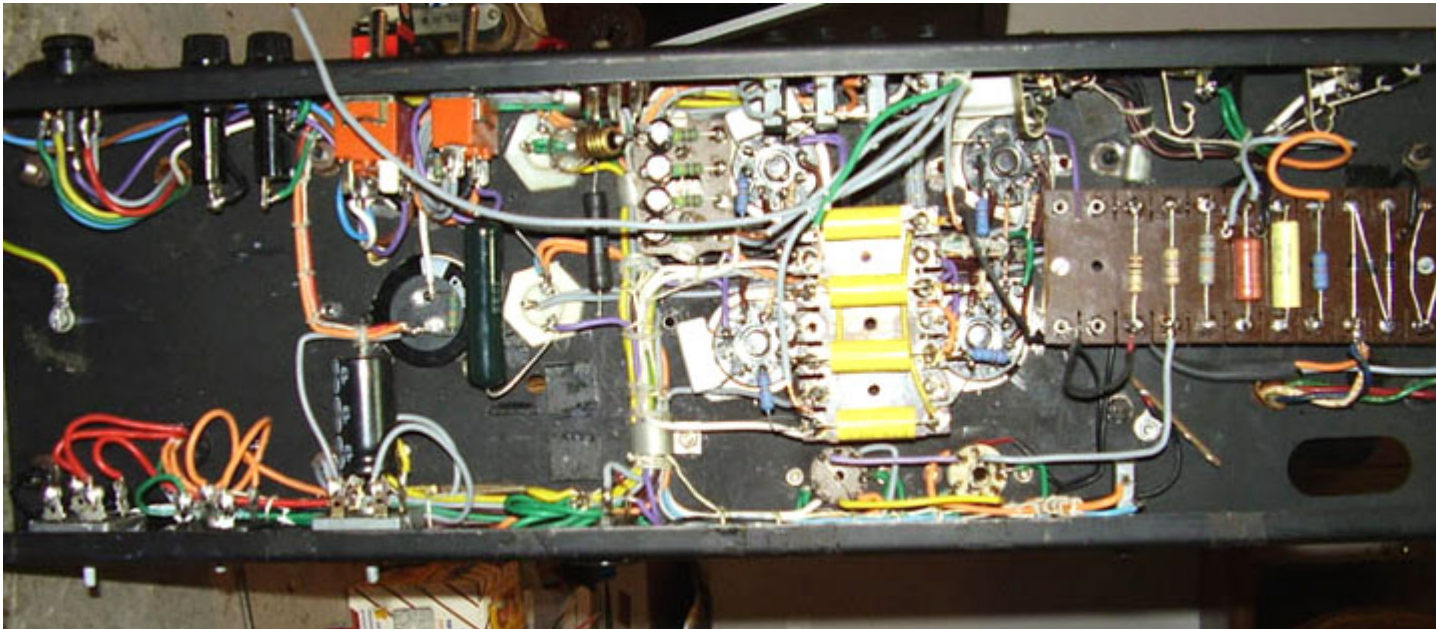
Power amp section showing the new PL36 output tubes in place.



Power amp section showing the new PL36 output tubes in place.



Underside of Power Amp Section with work partially complete.



Underside of Power Amp Section with work complete.
