

Cleo V

pre amplifier

A superb line amplifier all chapters...

Update: 15-8-2006



Cleo V?

The descendent of the Cleo4, the double chassis based pre amplifier, is not developed because I was not happy with the old couple, it was just because I didn't have enough inputs available.

I had mounted 4 sets of RCA input busses, what was more than enough when I made it. But when a SACD- and a DVD-A player entered my home, it became very busy at the inputs. The CD player had to be connected to it's own DAC, the Tuner was still there and ofcourse there was my Record player. I needed just one more input. There wasn't much space available to expand the Cleo 4. The moment to come with something new....

I still wanted to make the pre -amplifier in a double mono configuration, but I didn't want to use 2 separate chassis for the Power Supply and Amplifier parts. If you are more than average busy with these devices (just like me) you find out quickly, that 2 chassis are not that practical.

The second reason is, that you have more effective building space in one chassis than in two. I don't have to tell you probably, that the wiring is much simpler in a single chassis Amplifier....

Ofcourse when you're thinking about building a new Amp, the new one has to be better than the old one, in this case the Cleo 4. I think I really succeeded, although I have to add, that my old Cleo 4 had a lot of these updates afterwards. If you want to build this Pre-Amp, but don't want to spend a lot of money; there is a way to build this Amp in a cheap way, without totally giving in on quality. I will come back in this item later.

The beginning...

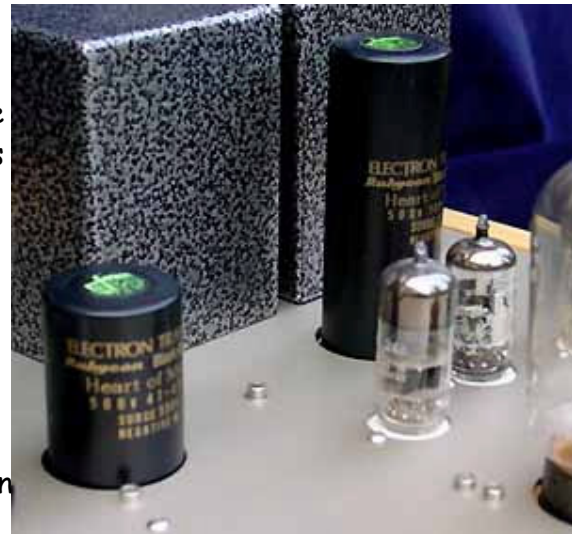
The wooden box to carry the chassis plate, had to fit the new Attila Power Amps. They were made by my Audio friend Guido, so I contacted him again. The top plate is made of 2mm copper (420x350mm) and the bottom plate is made of perforated steel (what I get from my good friend Marco) The Beatles and Joe Cocker sung about this phenomenon many years ago: where would we be without a lot of help from our friends....

...with a perfect Power Supply....

That was the framework of the new Pre Amp and now the filling-in, beginning with the Power Supply. This had to be made without any compromise -or- on a way that the compromise wouldn't be in the way of other things. I had a meeting with Wil Blaauw of AE, the man who had never said "No, that's not possible" when I came with a new idea. The 2 PS transformers are made the same way as the ones for the Attila: tight regulating, a very low heat dispersion and absolutely quiet when in use. No hum, nothing nada, not even a single resonance. When in use, the temperature of these transformers won't become much higher as the environment temperature, not even after several days of continuous use! You will hear nothing when switching the power switch... The inrush current is so low, that you won't have to bother about a high value circuit breaker for backing up the switch-on surge

The chokes must be of a very high quality, that why I used a broadband design with amorphous cores. The blessing qualities of these cores I had to witness first on my Goliath and after that ofcourse on my Attila.

Well, the power supply capacitors. There is a type that completely has my sympathy: the Black Gate WKZ. In spite of the high costs, 2 of these super Caps got a place in the Cleo V. Do we want a 'non compromise' or not? We won't give in on the last 180 euro. It's getting out of hand anyway.

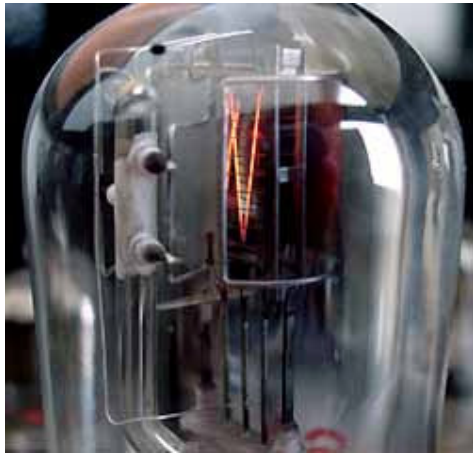


I first simulated the combination of capacities and Chokes, till I've got a stable and tight supply using the Duncan labs program: 'PSU Designer II'. Ideal, when you see how close the result of the simulation is in practice. The URL to this nice piece of programming (freeware) is to be found at the bottom of this page.

I use a 47uF/47uF/500 Volt and a 100uF/100uF/500 Volt type. When used in a double Pi configuration, the power output is super clean.

Tubes.....

The tubes I used are the same as in the last incarnation of the Cleo 4, where the beautiful Ba triode replaced the B406. The B406 is a nice tube, but they are very rare and "out of this world" expensive. I was looking just some time for a tube that was as beautiful as the B-406 and could put my hands on a Ba triode. The 'SIF' I like most. An extraordinary transparent and plastic tube. They could still be found by our eastern neighbors (where would we be without neighbors) It is an old German Post tube, the one that never gives in... The Ba tube will be heated with a current source, what's very easy to do using the PCB's that were designed by Doede Douma. (See URL at bottom). It is a high Class Pre Amplifier, but building is very good to do.



The rest of the tube setting is well known: AZ1 rectifiers, D3a as partner of the Ba in the mu-stage (2nd stage) and an optional ECC88 tube as a "low buffer" for driving my Active Sub-Woofers.

The other companions...

Instead of using a Pot, I choose a 41-step attenuator: very comfortable en well sounding. This is so beautiful... but wheep.... again high on spending.... However: with 140 euros not unreasonable high, when you see, hear and feel the quality.

Somewhat later this multi stepper is replaced by a laser trimmed high end regulator form the German Mfg. THEL. This was pointed me out by my Flemish audio friend Ward, in regard to my less positive experiences with changing the volume pot in my Audio Research LS7 pre amplifier. It worked out so well that this THEL volume pot stays where it is. I also going to try a 24-stepper in the Cleo-6, I obtained from eBay some time ago. It will be a lot easier to exchange and compare volume pots in the new 6 preamp.

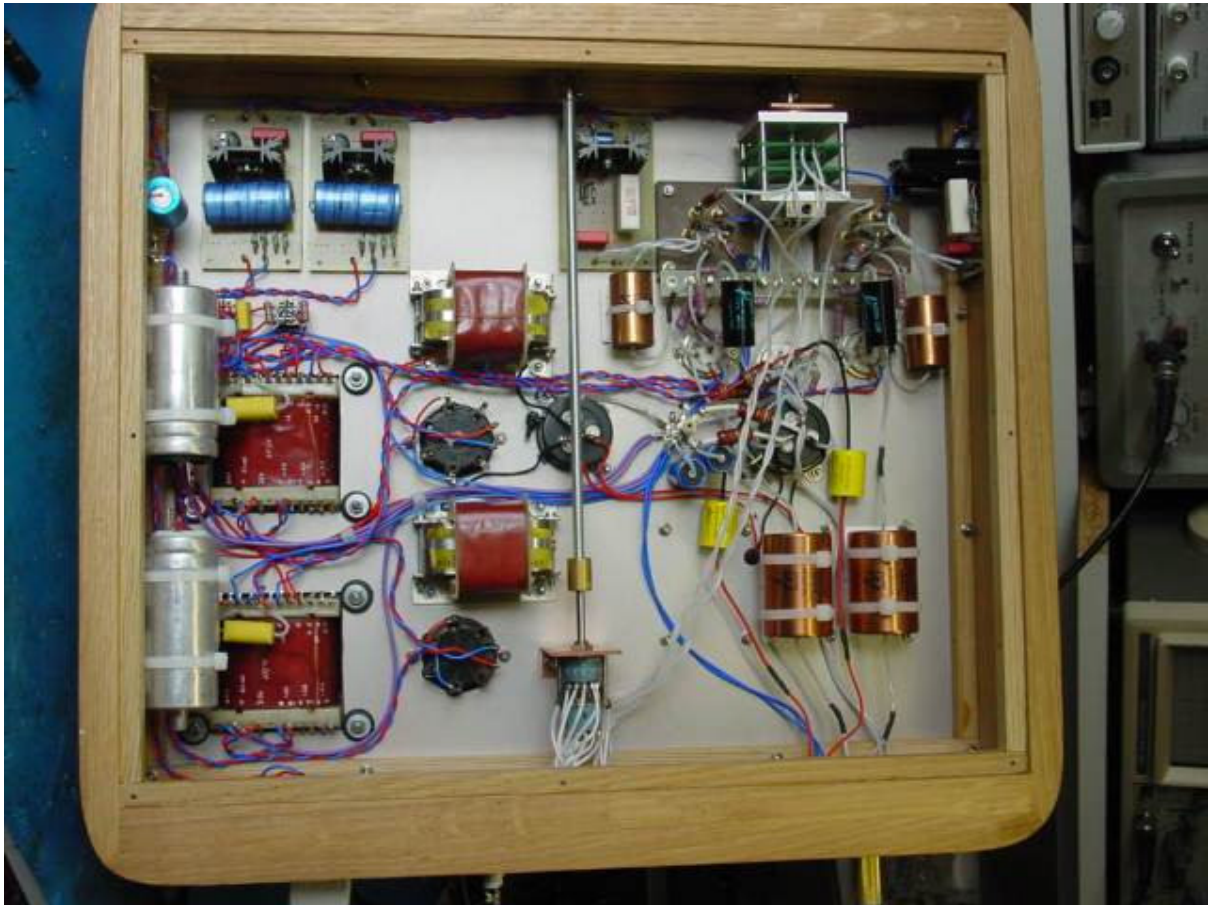
Do you want to save money here, you can go for the well known blue Alps pot. Perfect stuff for your money. *Never* choose for a standard carbon track regulator. Besides the less musical qualities, the unbalance of the channels will be a growing pain in the neck.... First the stereo image will be drawn to the left, than to the right..... aaarrggggg....

Sadly enough all photo material of the building of this amp is lost due to a harddisk crash, what resulted in not publishing the building pages. But don't be to sad.... Cleo-6 has seen the light and it is in general speaking equal to the 'V'.

...Nevertheless something about building the Amp....



The picture above shows the top side before the glowing inhabitants went in. The two black tube sockets next to the power transformers are the "apartments" for the AZ1 rectifiers, the brown 5 pin sockets are for the Ba tubes. The three noval sockets behind that are for the D3a's and an ECC88. The last one is optional and will be used as a (stereo) buffer stage for an active low-pass filter. Under the two caps which can be found behind the PSU capacitors, are two of the four chokes mounted. The two tumble switches are used for general power and standby.



Here the inside of the Cleo-V is displayed in all its glory. The PCB's with the visible cooling elements are for the supply of the Ba tubes. The PCB in the left upper corner, is for glowing the ECC88 tube. Both the aluminum colored capacitors are 10 uF MKP in oil caps, which are placed direct behind the AZ1 rectifier inside the power supply.

The input selection switch is made by *Elma*, which give you the opportunity to select six sources for you Cleo. The coupling capacitors used here, are *Audio Note copper-foil* capacitors of the last generation. Alternatives you can find in

Auricap, a superb coupling cap, or *Mundorf Silver/Gold* capacitors. And if you search well, you find more nice possibilities. With the just mentioned caps I have excellent experiences myself. Don't save money on these very important components, that have maximum impact on the audible quality.

...Cleo V anno 2006...

In the winter of 2005 it began to itch once again and the idea arose to make a more simple built of this reasonable complex line amplifier. That idea is grown to the creation of the Cleo 6. But there is more to tell. I wanted to use components that are easier to obtain. So... no Ba's and AZ1 tubes anymore, that become more rare and expensive every day. But which tubes are a full worthy alternative? The voltage amplifying tube, the Ba in this amp, is of crucial importance in this design. You can replace it, but you don't want ruin the overall setup. There had to be found a full worthy tube that had to be tested in the current amplifier. The only way to make a good compare. Everything stays well known and the only change is the new inhabitant..

And so it happened that the new tube was placed behind the old in the socket of the ECC88... The beginning of a beautiful new adventure.... Read more about it in the "Cleo 6 Files"....