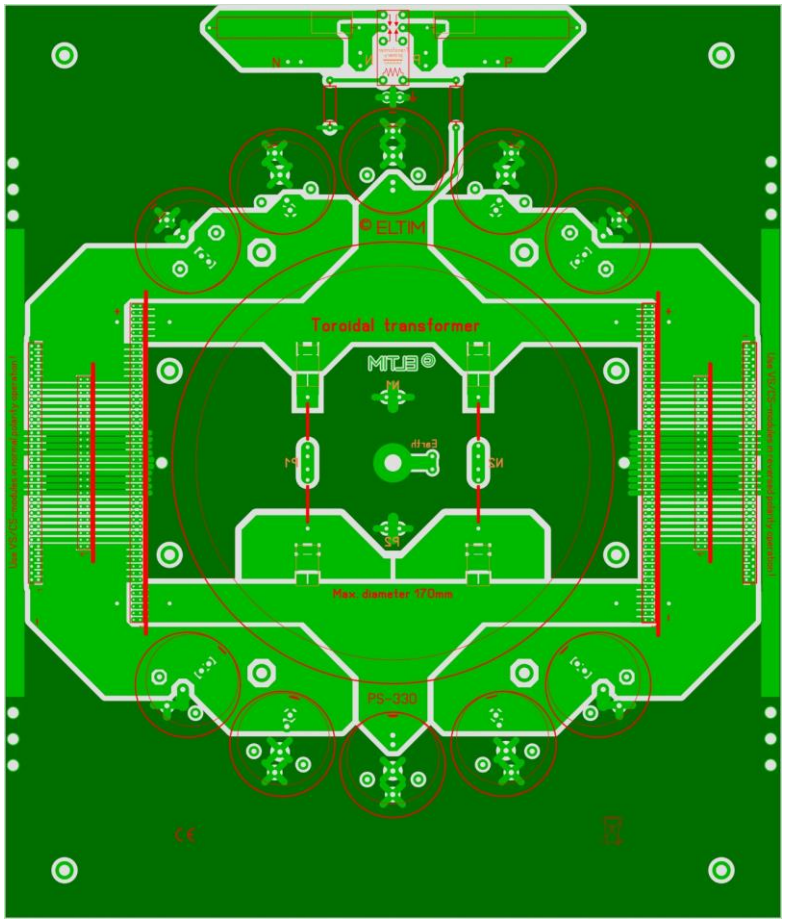
ELTIM High-End amplifiers

Updated 21th December 2020

Reversed polarity modification document

With “normal” amplifiers the modules are what they are. You need to connect is as told, that’s it.

We believed that we should not only develop our audio modules in a most symmetrical “wireless” way, but also wanted to allow a reversed polarity supply connection, where our power supplies would be symmetrical and most simple as well. Due to our “reversed polarity operating” we can make our real serious power supplies for heavy stereo or bridged amps in a most easy and symmetrical way, without crossing the supply lines like you normally would need to do. With wired amplifiers that is no problem, but we and obviously some of you as well, want an as clean as possible amplifier without wiring or complex PCB’s. Our real heavy PS-330 will look about like this:



Since the right channel is rotated by 180º, it “sees” a reversed supply voltage presented. Without further precautions it will fail to work of course. How to solve this is explained at the next page.

This huge Power supply module exactly fits in a MODU Galaxy 330 cabinet with a depth of 350mm. Our idea is that you can make a significant bridged Monoblock (up to 500Wrms??) or even an integrated amplifier i.c.w. our PRE-330 preamplifier module, also exactly fitting a 330mm wide Galaxy cabinet. Our new CS-75/100/150 also match Galaxy cabinet flank slides and will work with this huge Power Supply, since the CS-connectors at the most outer left- and right side are wired as all other supplies we developed. The smaller ones next to it can carry our VR-Voltage Regulator modules feeding the VS-modules and the very wide ones next to them our Protection Modules, monitoring about everything that can be monitored in a Power Amplifier. Since it can carry transformers up to 800VA, a quite simple inrush current limiting circuit is included (and required!) as well.

Since this PCB will also act as a chassis plate, there are lots of venting- and mounting holes as well.
Compared to others a significant detail, since we are not blocking venting air from the bottom upwards into the cabinet > significantly cooler amplifier.

Up to 800VA transformer and 10x Ø35mm 2-pin or Ø40mm 4-pin capacitors are mounted directly on the board. The transformer Ø170mm max, is connected invisible at the back side around the centre transformer mounting hole, exactly in the middle. Besides this transformer connecting you only need to connect the input connectors to the VS-input stage modules and the speaker terminals to the CS-output module.
So, even a huge and complex amplifier like this requires hardly any wiring.
We now have very nice TOROIDY (PL) Audio Supreme transformers in our program by the way. Unlike as in this picture they can be mounted on our example PCB without the extra mounting plate. Polished stainless steel pot, earth shielding, encapsulated, etc. Finally toroidal transformers all top DIY'ers were waiting for -)

Thanks to this reversed polarity option, the single sided PCB now is most simple with extremely wide tracks.

Connecting/mounting all is most easy as well: mount the transformer to this PS-330 and hardwire it at the bottom side, mount it to the bottom cabinet plate, mount the chosen CS-modules to the side flanks of a MODU Galaxy 350mm deep cabinet, connect all three parts, assemble the complete cabinet and add the VS- and optional VR- and PR-modules. After aligning the modules correctly all should work fine, about without wiring.

Modifying a standard ELTIM CS-module to a reversed polarity model.

Since our CS- and VS-modules are electrically and in PCB layout completely symmetrical, reversing polarity is most easy to do.

Modification of VS- modules:

- Exchange all left/right transistors with each other.
- Rotate all IC's, diodes and electrolytic capacitors by 180º
- (Exchange the 0Vdc trimmer parts and input capacitor, as always recommended for L/R units.
  While doing so, the input leads are always at the back end of the amplifier modules > short wires).

That's all, now the V+ and V- markings are exchanged and it is a reversed polarity type.

Modification of CS- modules:

- Exchange all left/right transistors and Mosfets with each other.
- Rotate all diodes and electrolytic capacitors by 180º
- Remove the 1k and 2k2 resistors close to the idle current setting transistor in the middle.
- Rotate the centre idle current setting transistor by 180º
- Replace both 1k and 2k2 resistors now at the free locations, right from this transistor.
- (Speaker connections are available at both sides of the CS-module, so no modifications required).

That's all, now the V+ and V- markings are exchanged and it is a reversed polarity type.

NOTE: don't forget to do this on both a VS- and a CS-module and keep them together.
Also, mark the modified modules as reversed polarity ones to avoid wrong assembly !

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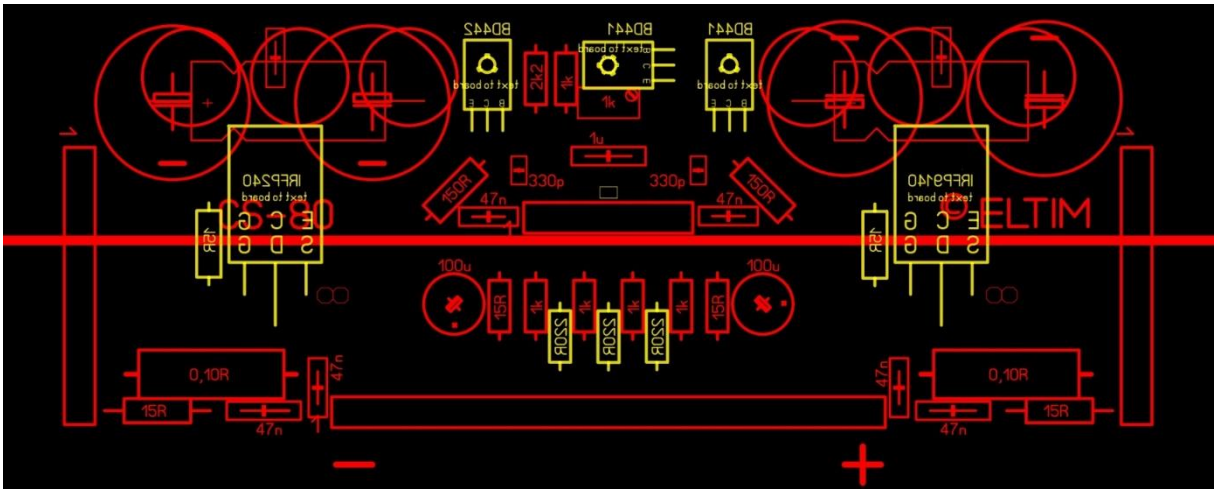
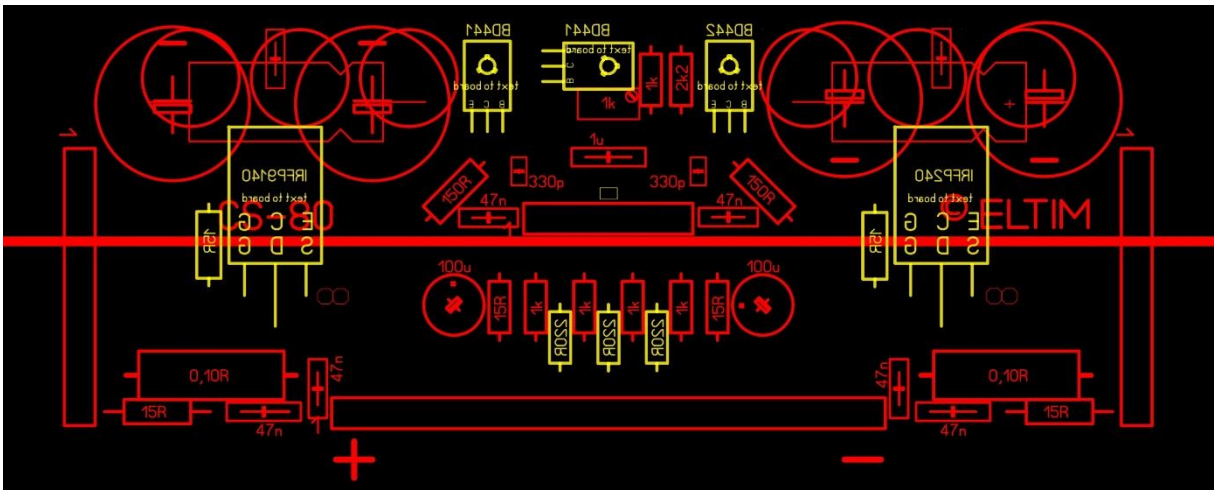
Now you can connect a normal VS/CS combination at the left side of our mixed power supplies.
Then connect a reversed polarity set at the right side. It will be marked on the PS-PCB's.

Since our modules are both mechanical and electrical completely symmetrical, left and right side still will look exactly the same. The audio signals will also "see" no differences between left and right at all.

Reversed polarity operation example:



CS-80 preforming with normal polarity supply: left side is V-, right side is V+



CS-80 preforming in reversed polarity mode where left side is V+, right side is V-

- All electrolytic capacitors rotated by 180º.
-All transistors and Fets exchanged left/right.
-Removed 1k and 2k2 at centre left top.
- Rotated centre top transistor by 180º.
- Placed 1k and 2k2 at the centre right top.

All our CS-modules can be changed/built in similar way, but: KNOW WHAT YOU ARE DOING !

If you want us to supply a module like this, please mention it in the order form comment line.

www.eltim.eu