

By "Moleculo" - January 2011



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Right at the end of 2010, Ameritron sent me an ALS-1300 solid state, 1200 watt HF amplifier to review. When I received it, I promptly took the AL-800H out of line and put the ALS-1300 in it's place. I've been running it on the Amateur bands and for MARS use since.

First, some pictures.



The face of the amplifier is large and the controls are easy to read and use. Once hooked up, the amp is literally a turn-on-and-play deal. One note, you can't just leave the Standby switch in the Operate position and turn it on. You must actively switch the Standby switch to Operate; if it was already in Operate when you turn it on, you must toggle it. This is actually a pretty good minor insurance feature. Then just switch it to the band you want to use and you're ready to go.

This is the 50 Volt power supply that ships with the amplifier:

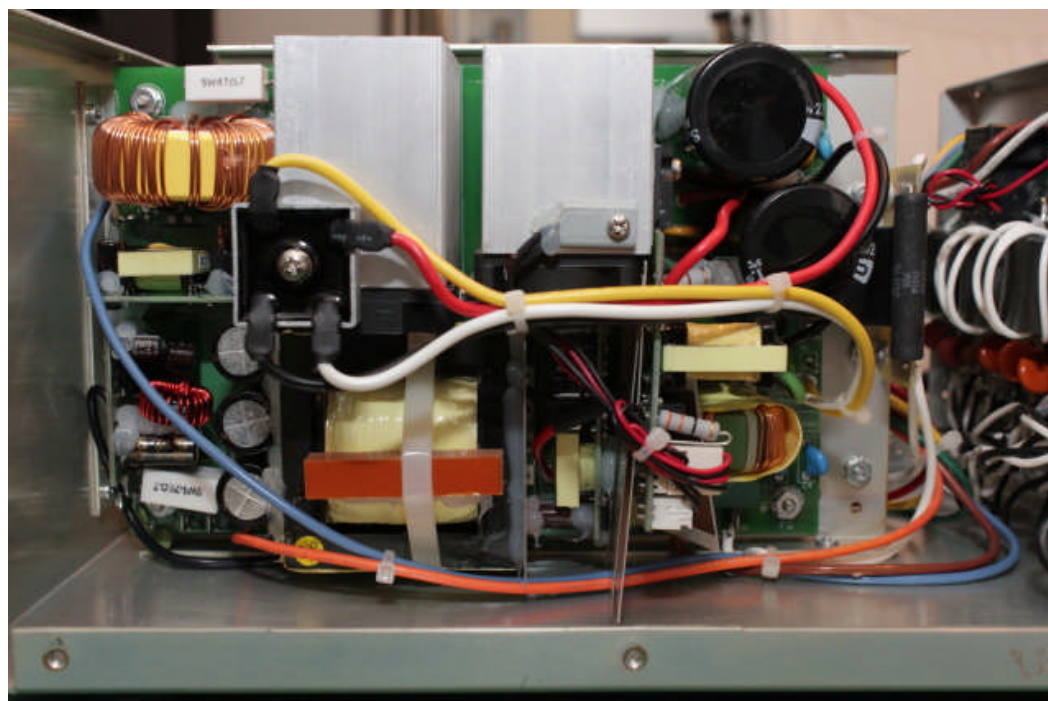


The power supply is actually much lighter than I thought it would be and any average sized person can lift it or move it around without struggling. For perspective on the size of the power supply, I stuck a wine bottle next to it:

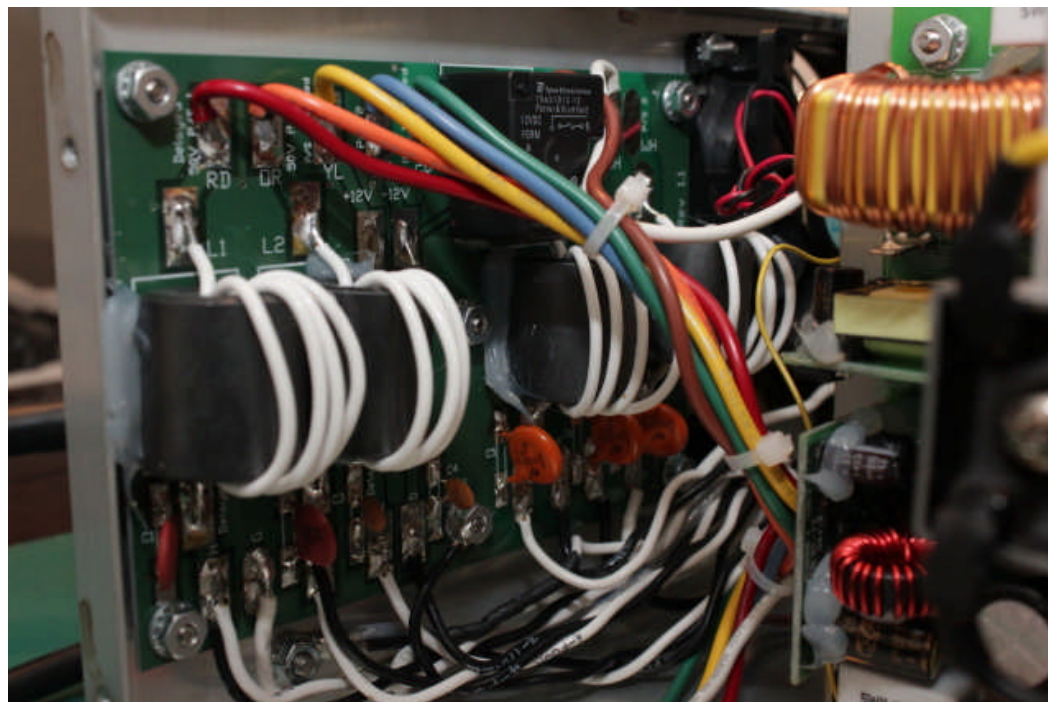


You can also see that the amplifier vents out the top, so you need to keep that area clear.

After removing the case, we can get a good look at what's inside the power supply. It is basically two power supplies hooked up in series mounted back to back. Here is one of the supplies:

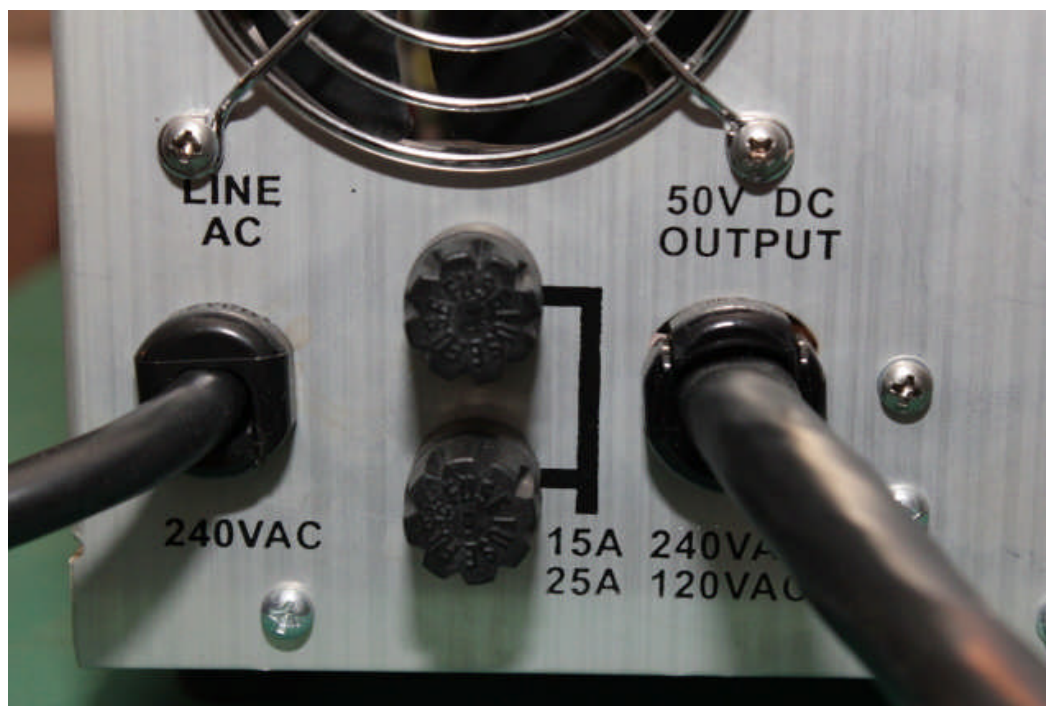


The back of the supply holds the board that interfaces to both the house mains and the amplifier. Also note the large sized torroid RF filters.



As a side note, the power supply contains both of the power cords needed to hook up to the supply voltage and the amplifier. The actual amplifier has no power wires.

The power supply comes with 15 amp, fast-blow fuses located on the back. You need to supply your own 25 amp fuses if you run it on 120 volts.



Here is the back of the amplifier:



Note the large Cinch Jones connector that interfaces to the power supply harness. Everything else is pretty standard.

Four large fans blow cool air under the heat sinks and out the other side's exhaust port:



Exhaust port:

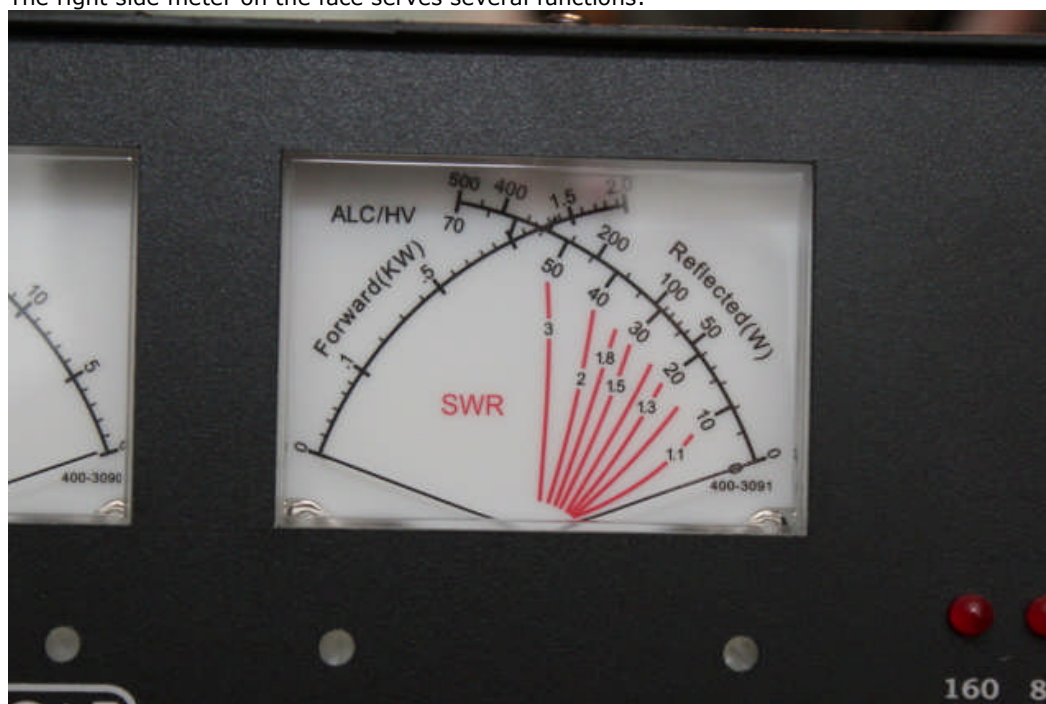


To help gain perspective on the size of the main amplifier, I've again placed the wine bottle next to it:



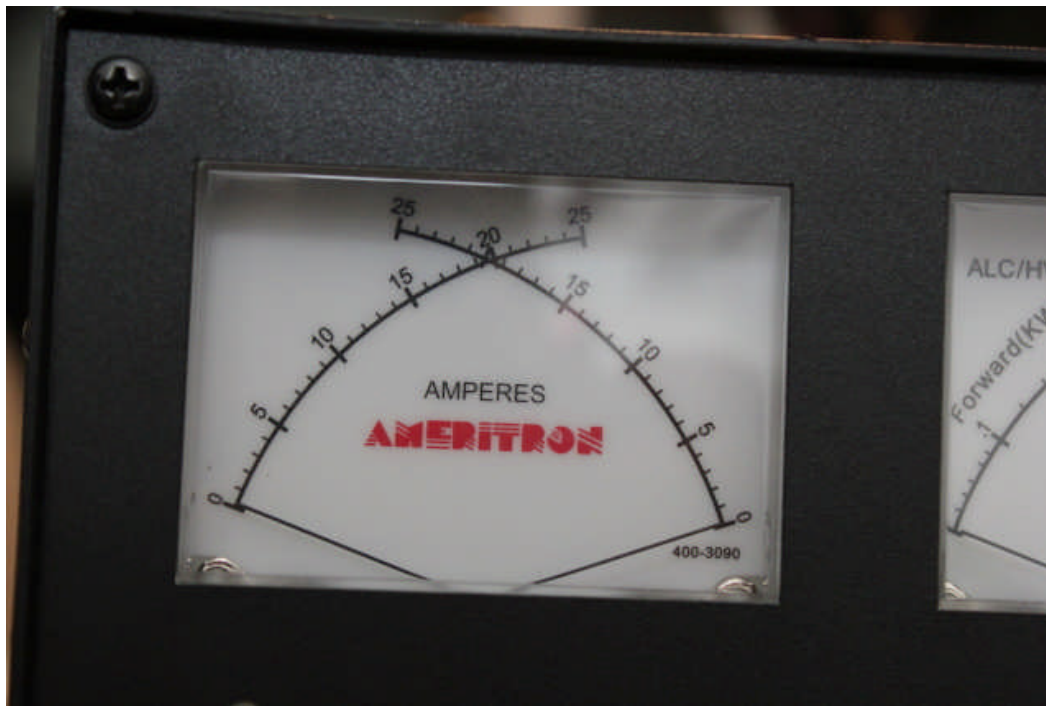


The right side meter on the face serves several functions:



Most obvious is that it acts as a power/swr meter. However, you can turn the knob to the PAB setting and then the right 500 watt scale on the meter shows the difference in power output between PA module A and B (more on the PA modules later). If you switch the meter to ALC mode, you use the 0-70 scale on the right side for ALC voltage, which corresponds to 0-7 volts. If you switch the meter to either of the HV settings, the meter shows the operating voltage of power supply module selected, on a scale of 0-70 volts.

The left side meter shows you the current drawn by each of the power supply modules:

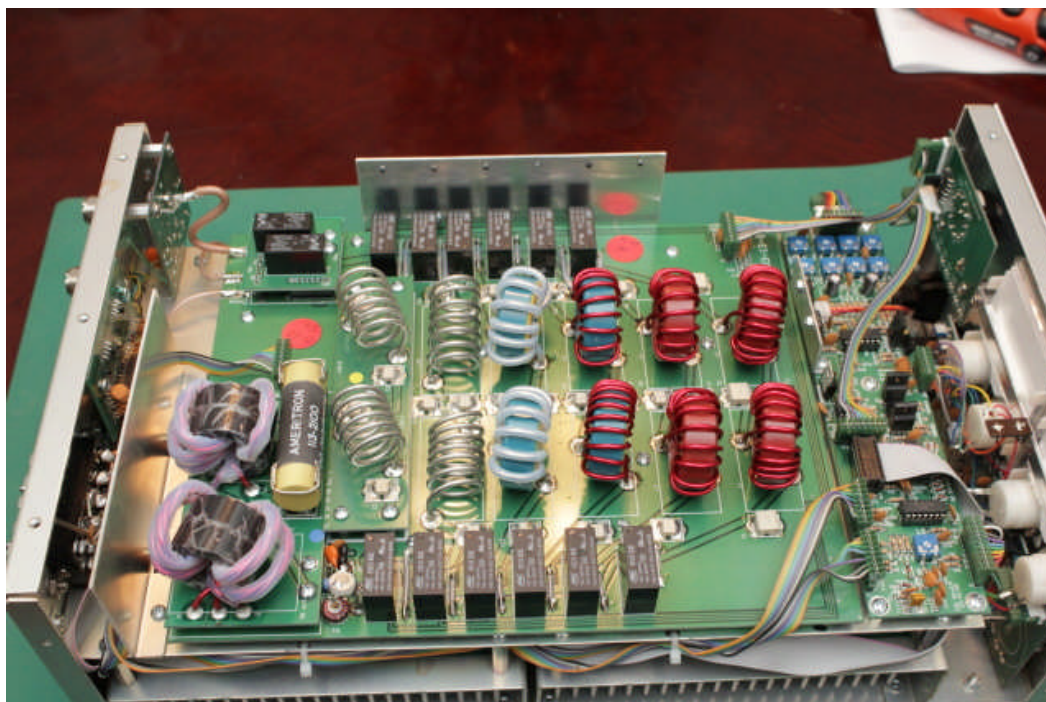


Next, I tear apart the amplifier and show what's inside!

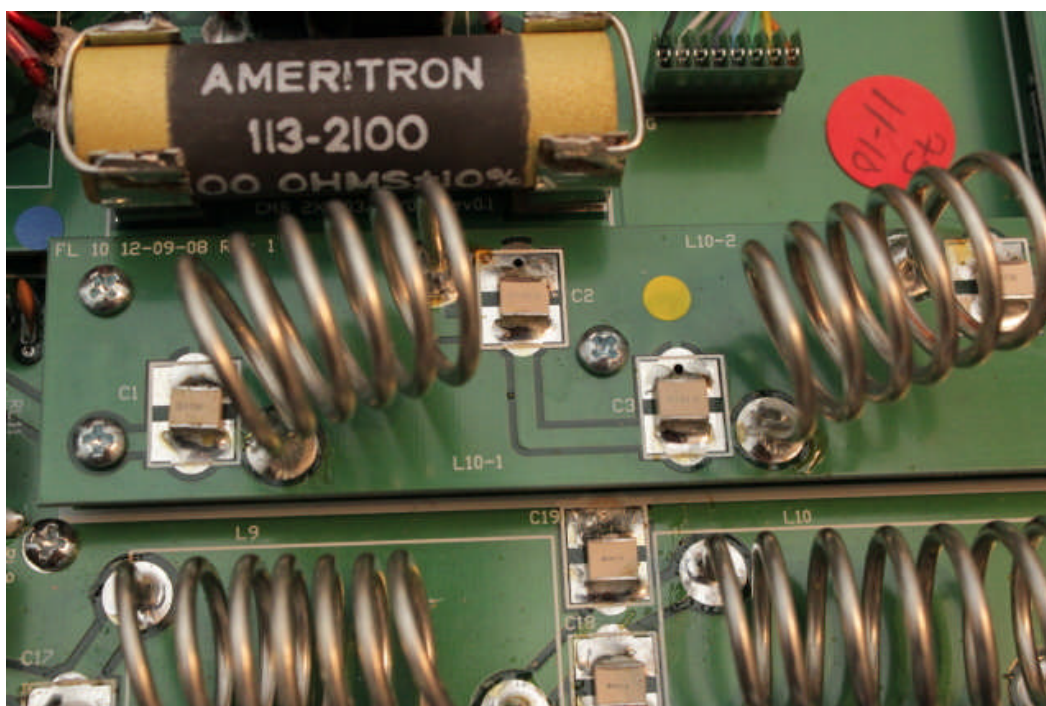


### Inside the Ameritron ALS-1300

Once you've removed about 25 screws on the top cover, the first thing you notice is that the inside of the amplifier is built like a double-decker bus, in two stacked sections. The power amplifier boards are on the bottom and most of the other boards are stacked on top. Here you can see the filter board on top, as well as a few others:



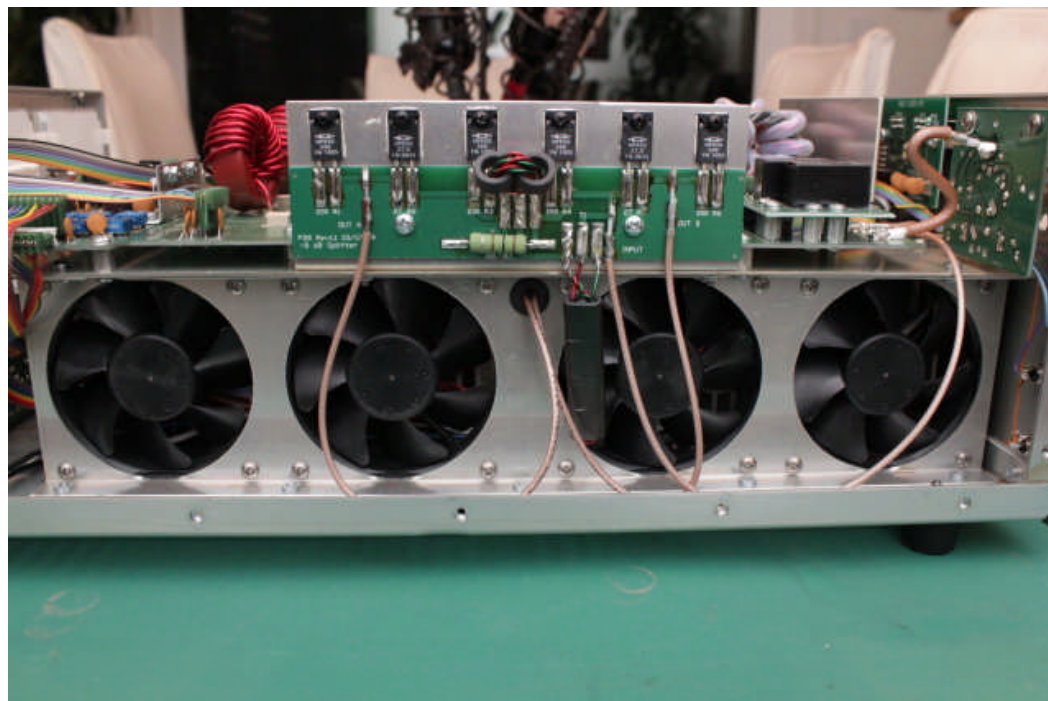
Here is the optional 10/12 meter filter that enables the amp to be used on those bands. It's labeled FL 10 in the picture and attaches by simply with four screws.



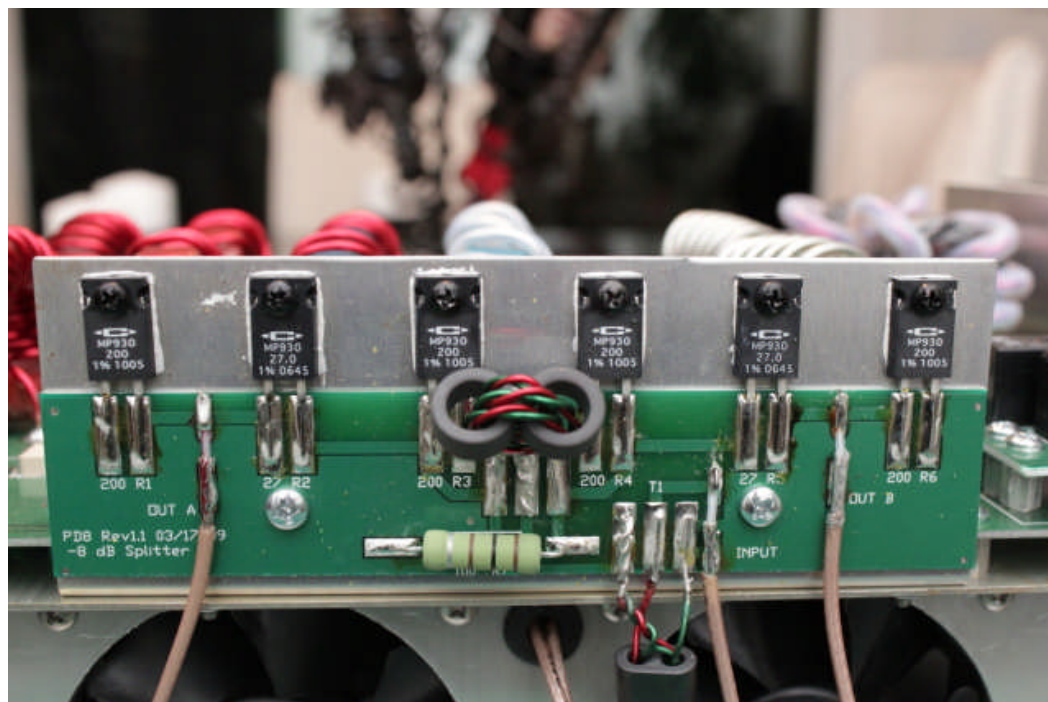
Here is the 2KW combiner board:



Here is a view of the side where the intake fans are mounted in front of the heat sinks. Notice that the power divider board is mounted vertically right above:

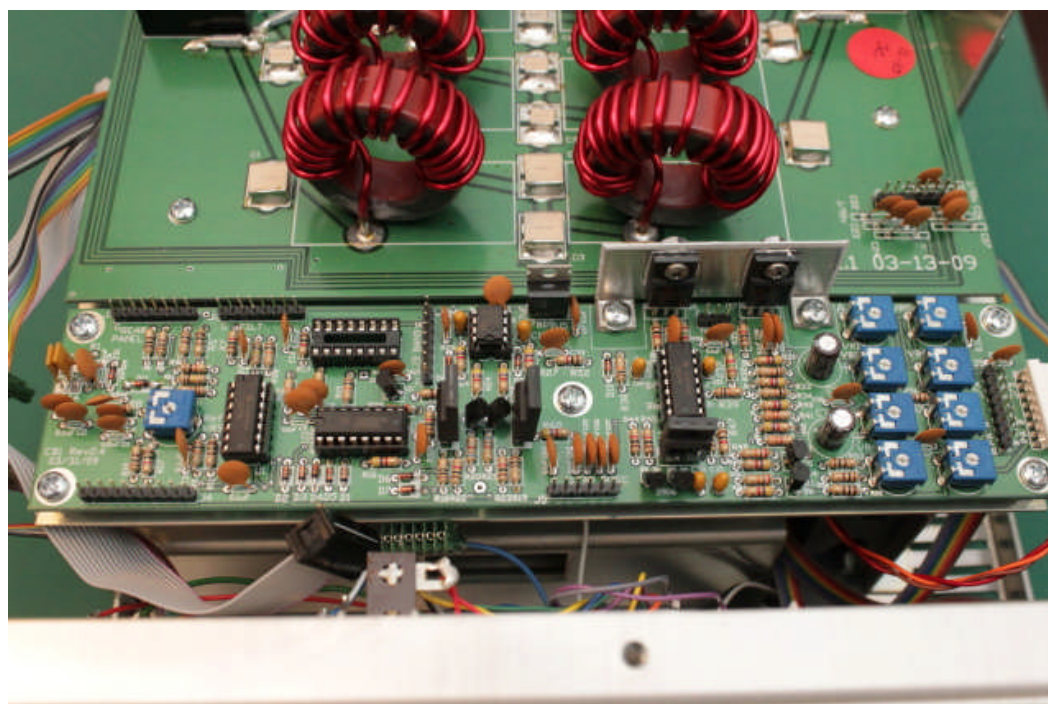


Here is the close up of the power divider board:



The power divider board essentially splits the input signal evenly between the two PA boards, delivering 10db of isolation between them. This circuit also guarantees 50ohm impedance input to the PA's. The idea is to guarantee that the input is extremely stable.

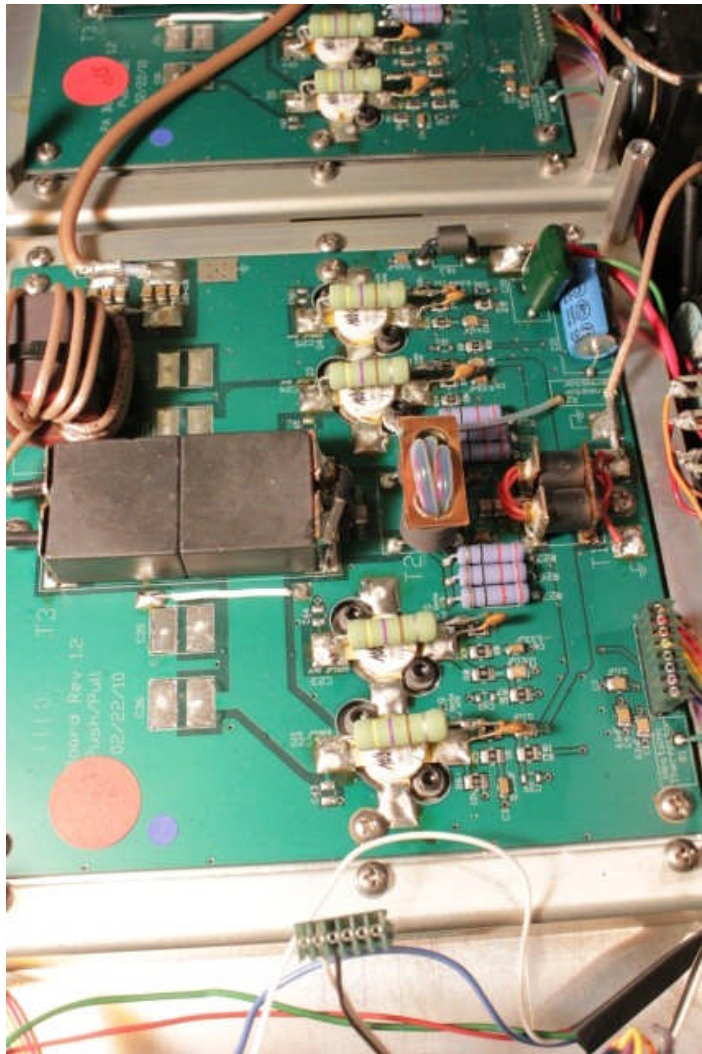
On the other side of the top deck is the control board. This board has quite a few ribbon connectors (most of them disconnected in this picture) that interface to other parts of the amplifier:



To get at the PA units below, you have to remove all of the boards that I've shown so far. This involves disconnecting all of the interface cables on the control board (remember where they went!), removing the 10m option, the combiner, the power divider, and the filter board. It seemed like about 40 screws! You can then very carefully lift up the filter board to reveal the shield below. If you need to service the PA boards, you will have to de-solder the coax cables fed to this board. For pictures, we can just lift it up and rest it on the case. Here you can see how I did this before the control board was removed:



Once you've removed everything in the way, you have a few more screws to remove on the shield/deck to move that out of the way revealing the two 600 watt PA modules below:



The PA's are run in parallel and each use 4 MRF-150 MOSFETs. I'm no amplifier/circuit design guru, but when I compare schematics it appears to me that the design used is based off of Helge Granberg's Motorola EB104 application which can be found here: [High Power Solid State Amplifier](#).

It was a fun endeavor taking the ALS-1300 half apart, but even the amount of disassembly I did is not for the faint of heart. If you decide to service this amplifier yourself, you really should take a picture of where all of the wire harnesses attach and label the coax cables that will need to be desoldered.

Not shown here are a few miscellaneous boards like the remote interface, meter and relay board.