

DUAL QUAD 84

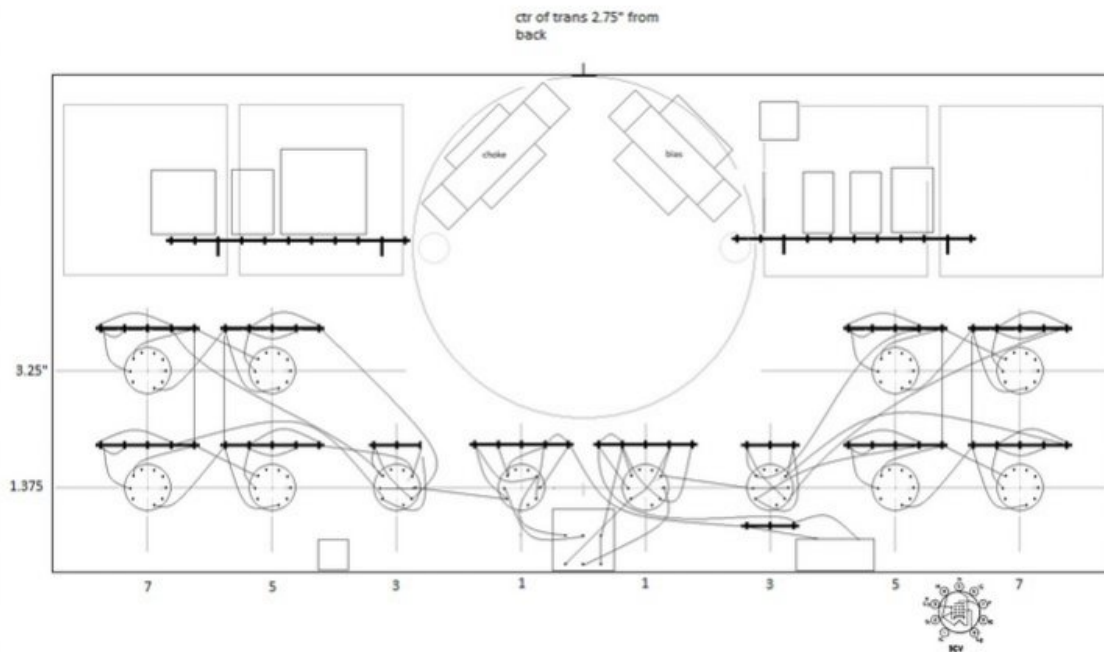
I've been working on an amp build with parallel output transformers, for the very first time. As can be deduced, these potentially can be fraught with issues- oscillation and other misbehavior being very high on the list... there's all sorts of opportunities for paralleled components to interfere with each other!!

Well, apparently, I dodged a LOT of bullets. I did do a LOT of thought, on preventing common sources of interference- to the point of using separate phase inverter triode stages for each pair of output tubes (there's a total of four phase inverters). As a result, this one actually worked on the second try (the first try required changing polarity in the circuit to get the feedback loop to work correctly- a simple wiring "oops"), with no oscillation whatsoever, under my favorite range of feedback for these smaller amps (about 12dB).

The amp is using the somewhat-popular Leslie 100-12 output transformers- which are usually 9K to 16 ohms, for EL84 output tubes. So, my take was- parallel two per channel, and that becomes an EIGHT ohm output system (two 16 ohm OPTs paralleled equals 8 ohms output matching, just like paralleling two 16 ohm speakers gives 8 ohms).

This, frankly to my surprise, is one of the MOST POWERFUL things I've had on my test bench, PERIOD. On paper, it should be about 25 watts per channel- but it's the first amp I've ever had on the bench, that made my bench CD player SKIP from the bass from the bench speakers (and I can absolutely just overdrive the poor bench speakers, on low bass, too)!! And I've had Dynaco ST70s, Scott 299s, Sherwood S5500-IVs, and even Dynaco Mk II amps on there before...

Here's a picture of the layout diagram of the amp, as would be seen from underneath:



It's using 12AU7s for preamp, driver and phase inverter, and pairs of EL84s (one pair per OPT) for output. Hence the "Dual Quad" moniker- there's four EL84s for each channel (in a square layout).

This is also the first time I've scratch-built with a toroidal power transformer- I was sure to put the requisite inrush limiter, to keep from blowing fuses. But, the benefit is an EXTREMELY RIGID power supply- even without active regulation- it drops only 1% in voltage (from about 297 to about 294.5v) from zero to HARD CLIPPING output level on both channels!

It's also got a volume control and four-source selector (it is a full function integrated amp, with four line inputs). It's "medium" gain- you do need to crank the volume control to close to max to get it to clip on a standard line source- but it does make it to full volume, fine. IMHO, that's a lot better than one that maxes out before you get to 10:00 on the volume control!

I will be getting pictures of the amp as it nears completion now- I still have to finish fabricating the bottom panel and doing a little clean-up here and there... but this one is a little MONSTER. And the sound, so far, is fantastic- I don't think I've heard that much image depth on my crappy workbench before...

The great thing about this- is that if you are a person who loves EL84s, but needs more power- THIS is one good way to do it, apparently.

Q: *Is yours running two feedback loops, one per amp, or is it a single loop with a common voltage amp?*

Common voltage amp and feedback loop. It splits at the inverter (the voltage amp feeds both inverters on a channel).

There was no reason to run separate voltage amps, since there could not be separate feedback loop signals (since the secondaries were paralleled, there's only one feedback signal source).

I just wanted to make sure that no elements of the output tubes were connected directly together, in any way, from an AC sense, to reduce the possibility of parasitic oscillation. Separate OPTs mean separate plate leads- but with separate inverters, the grids are also separated. And the screens have stopper resistors, so they're relatively separated (from an AC/oscillation sense) as well. Even the cathodes have 10 ohm resistors (for the bias measurement), so that somewhat isolates them that way too...

The power transformer is an Antek. 230VAC@400ma x2 + 6.3v @4A x 2. I also used the transformer cover for the 200VA transformers from there. Unfortunately, Antek looks to be out of stock on those now.



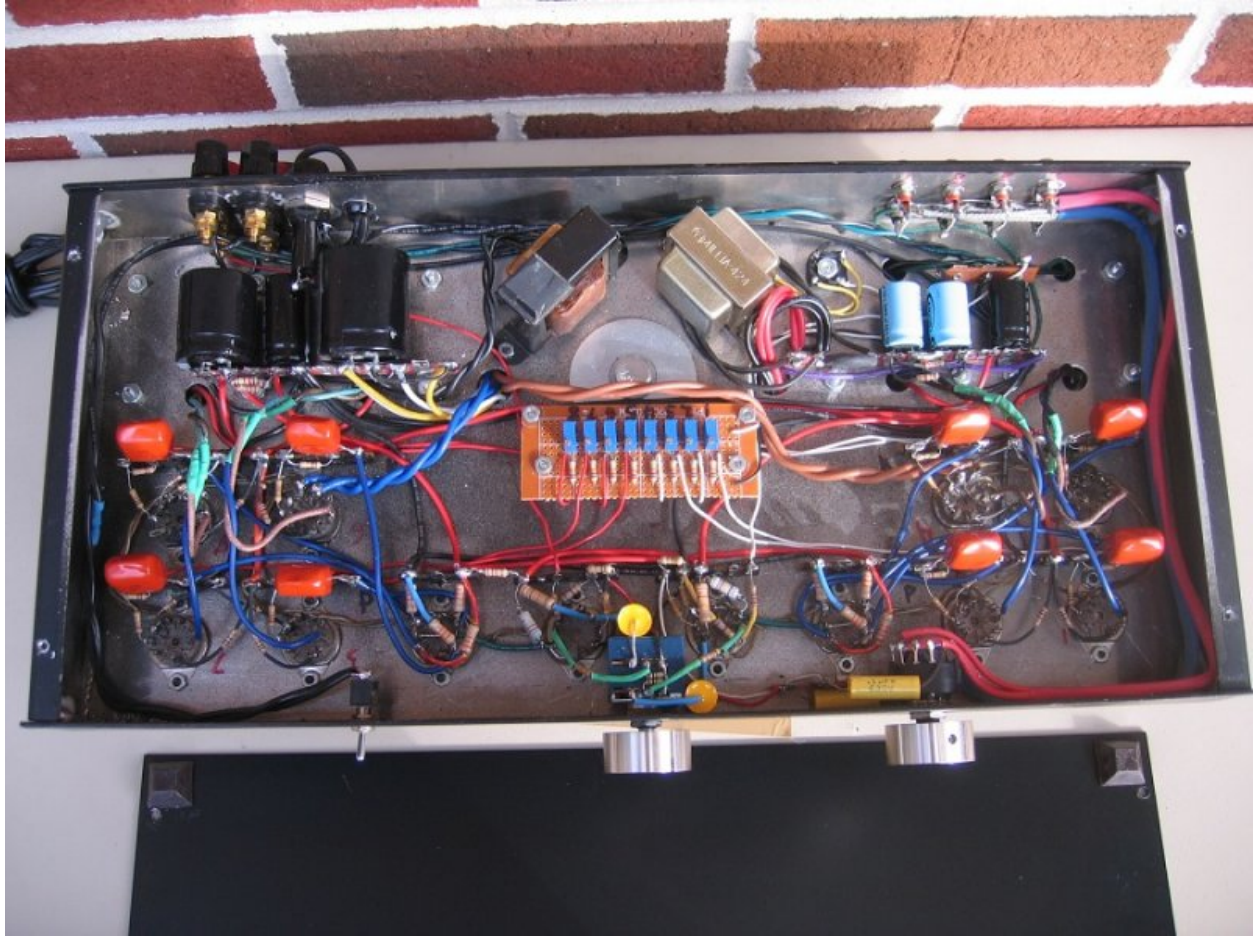
Note the tube layout- a quad of EL84 and two 12AU7 (these actually are 5814s, which are kind of like "12AU7 on steroids") per channel.



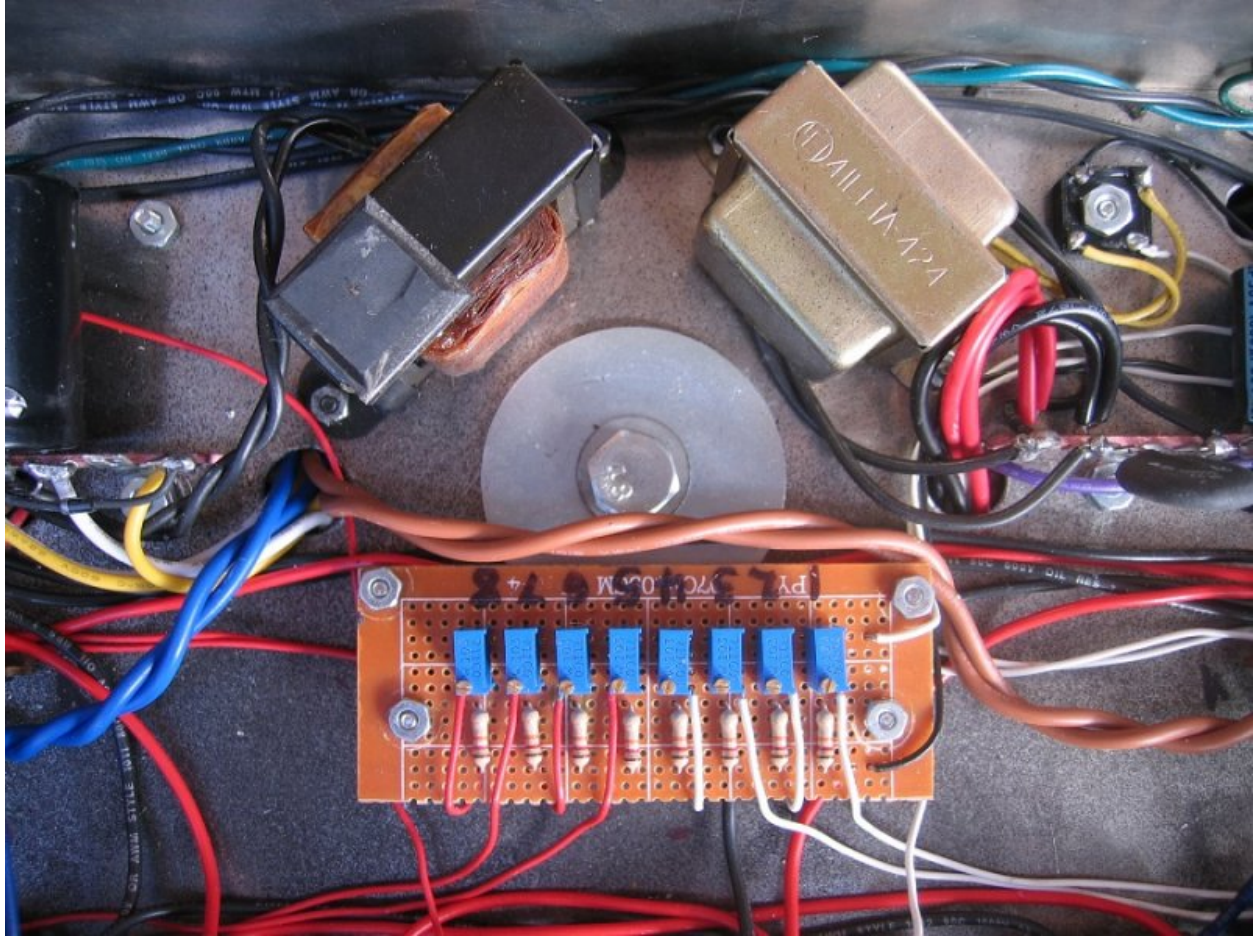
Four line inputs, speaker outputs. Note FOUR output transformers!



Source selector, volume control, and power switch, from left to right.



Inside- Alps RK27 "Blue Velvet" volume pot, massive power supply (the biggest cap is 470uf @ 400v, and the next biggest is 220uf @ 400v). Four stage power supply (main cap,choke, plate/screen cap, inverter cap, preamp cap). Separate heaters for each channel.



Bias supply and adjustments. The gold-color transformer provides bias AC voltage, to the bridge rectifier on the right. Two stage bias supply filter, with separate pot for each output tube. Each pot numbered, as is each output tube socket, corresponding.

This was a LOT of work, but it fired up gratifyingly readily! I now need to audition it on some serious speakers. Maybe the Tannoy Definition DC8Ts and/or the Focal Sopra 3s at work...

(source: <https://audiokarma.org/forums/index.php?threads/the-dual-quad-84-amplifier-now-were-playing-with-power.798989/>)