

Hasse Mods for the Ampeg J20 Guitar Amp

The following is adapted from a post I put up on The Gear Page, in the Amp Technical forum. It shows the mods I did to my Ampeg J20.

Okay, here's my mods for this amp, well, so far. Seems I'm always thinking of other things to do, and this is no different. I'll play with it like this for awhile before I change it.

Anyway, I already outlined earlier what I wanted to do with this thing:

- Give it adjustable bias
- Fix the Standby
- Cut some bottom end to reduce the flubbiness when you push the amp hard
- Change the two inputs to a single input with a switch to choose between them

Start with bias adjust. My amp was running the tubes hot, even after swapping the stock rectifier for a JJ's GZ34, which did drop the B+ voltage about 7vdc, but the tubes were still dissipating more than 70% of max at idle. So to correct this, and make the bias adjustable so it can be easily changed when the power tubes are changed, I made two changes:

- Swap the stock 22k bias set resistor with a 51k resistor, that will get me more bias voltage so I can cool the tubes down a little bit.
- Add a 100k trim pot wired as a variable resistor around that 51k resistor. That allows me to easily adjust the bias voltage to accommodate different tubes.

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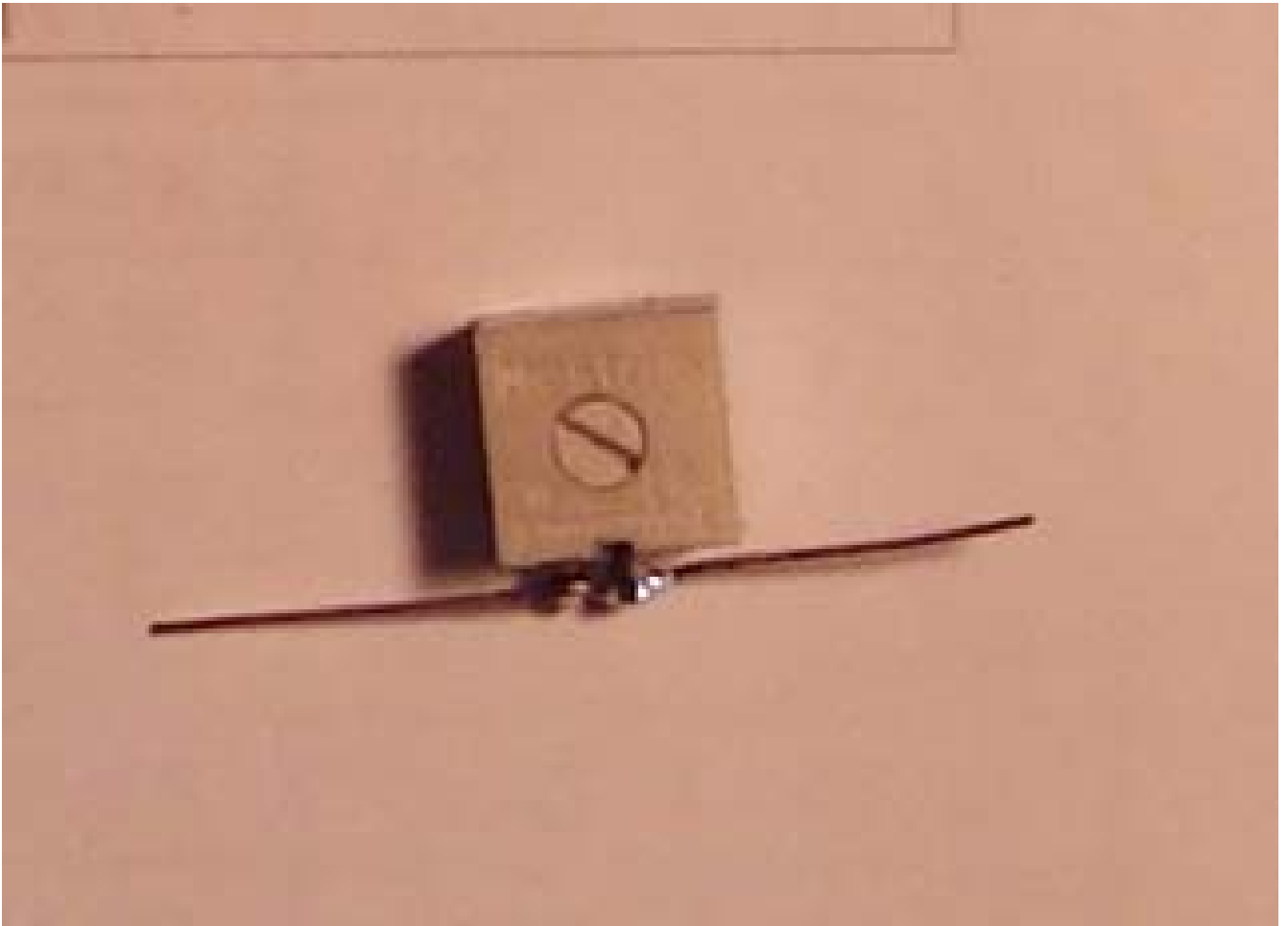
To start with, here's a picture of the stock bias circuit and the parts you need to work with. The bias resistor sits underneath the electrolytic cap circles in this picture.



1. First thing to do is to remove the capacitor, but be careful, you'll need to put it back later. Heat the turrets until the solder melts and gently pull the leads out and set the cap aside where it will be safe for when you need it later.

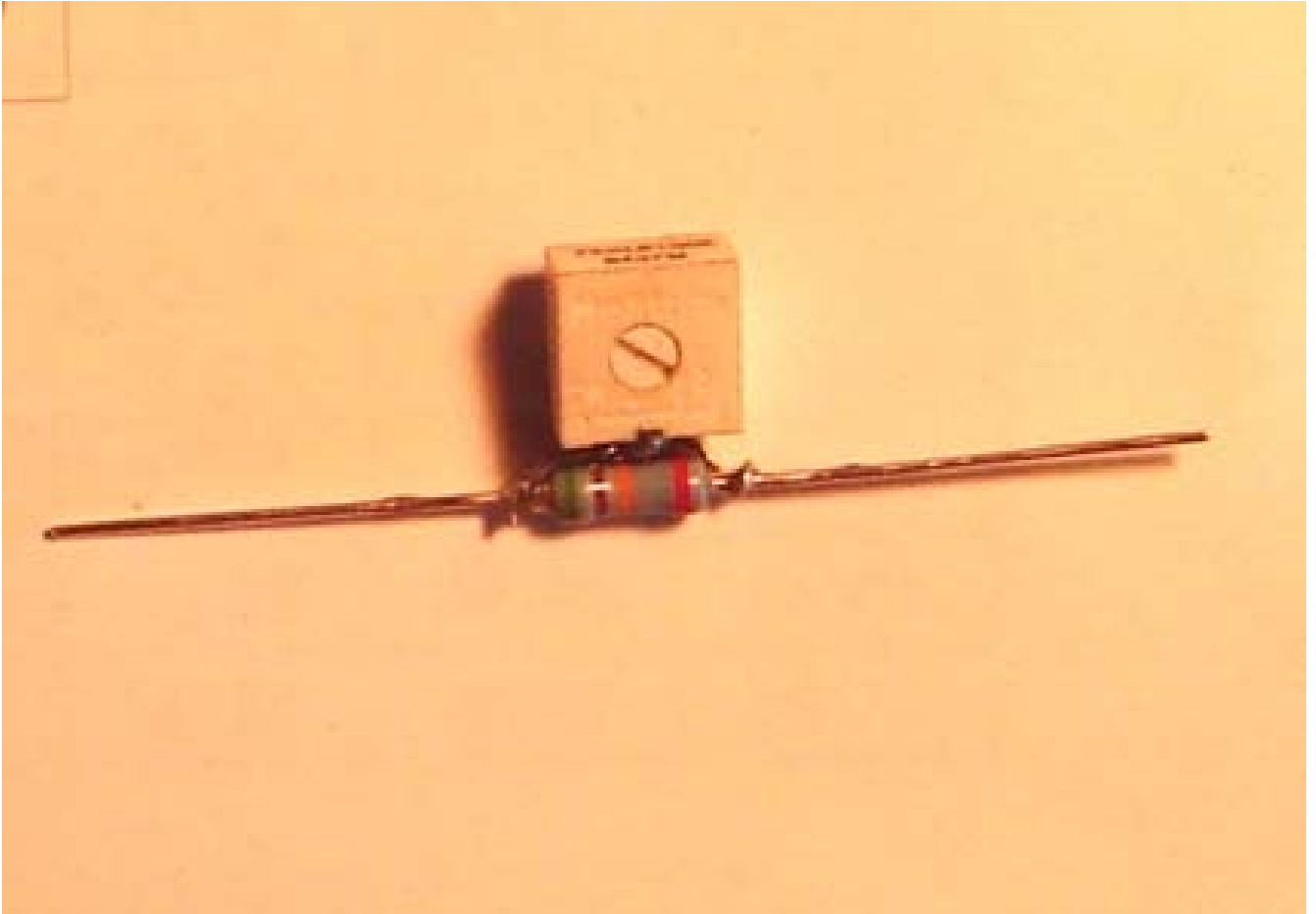
This will give you access to the bias resistor. Heat the turrets again until the solder melts and remove the resistor, then clean the turrets up of all the old solder to make for a clean installation when you install the new resistor. Desoldering wick works well for this.

To make this adjustable I used a trim pot I picked up at one of my local sources. This is a small trim pot intended to be mounted onto a pcb. It has three terminals, like most pots, but I only need to use two on them, the center terminal and one of the outer terminals. So I folded the other outer terminal I don't need out of the way, and then soldered on some extensions to the two terminals I do need. I used some old resistor or cap leads that have been trimmed off for some previous project, so it looks like this:



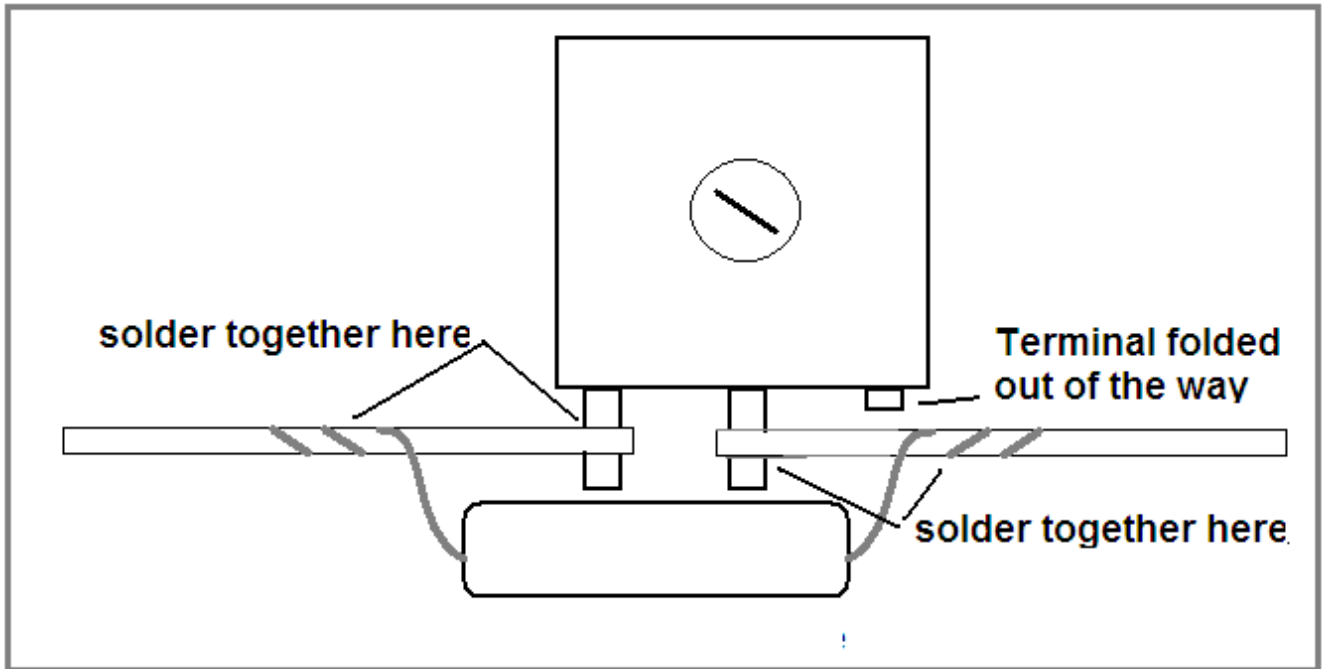
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Then I wrapped the new leads around the leads of a 51k ½ watt resistor, like so:



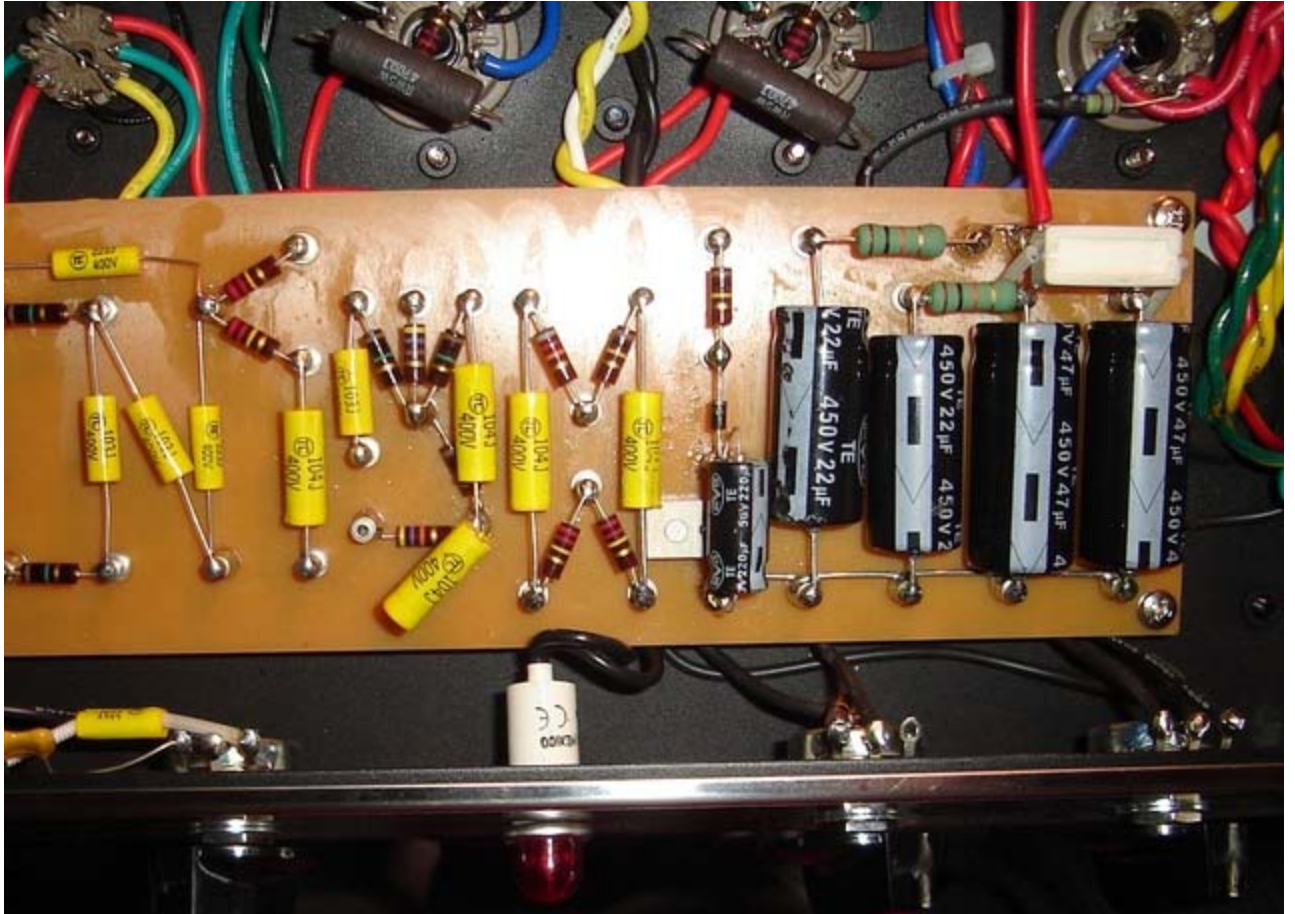
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Just to clarify, here is a drawing that may help you see what I did:



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Then install the pot/resistor combo into place, then reinstall the cap. Voilla! Adjustable bias. Works great.



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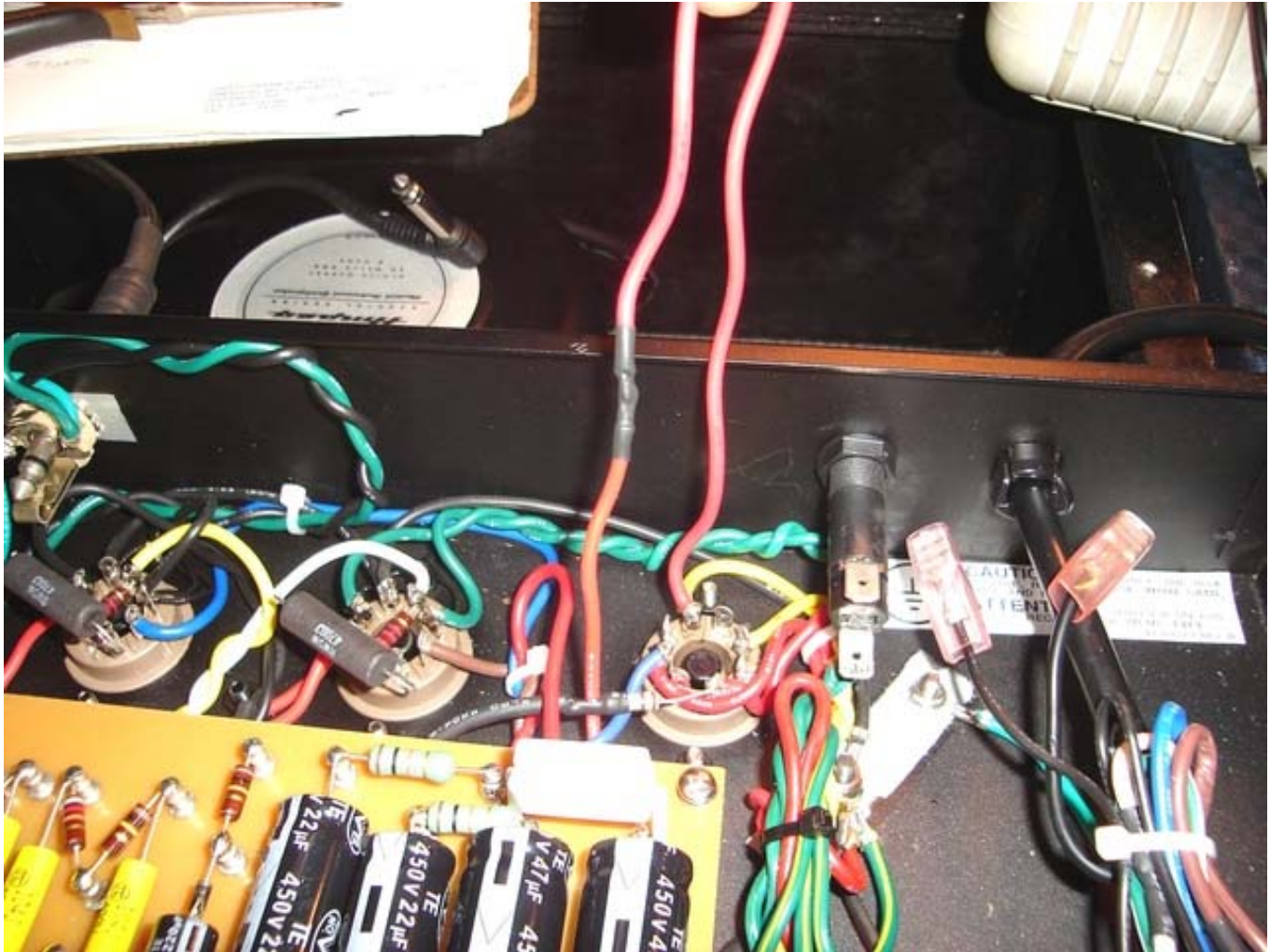
2. Next is the Standby upgrade. This is much easier. The stock standby is put between the power transformer center tap and ground. Which is fine for a cathode biased amp, but not for a fixed bias amp. To make it work here they added a resistor to partially bypass the standby switch, so that the standby is always partially bypassed, and never totally quiets the amp. The solution is to just ground the power transformer center tap and move the standby switch over to just after the rectifier.

Here is the stock standby arrangement:



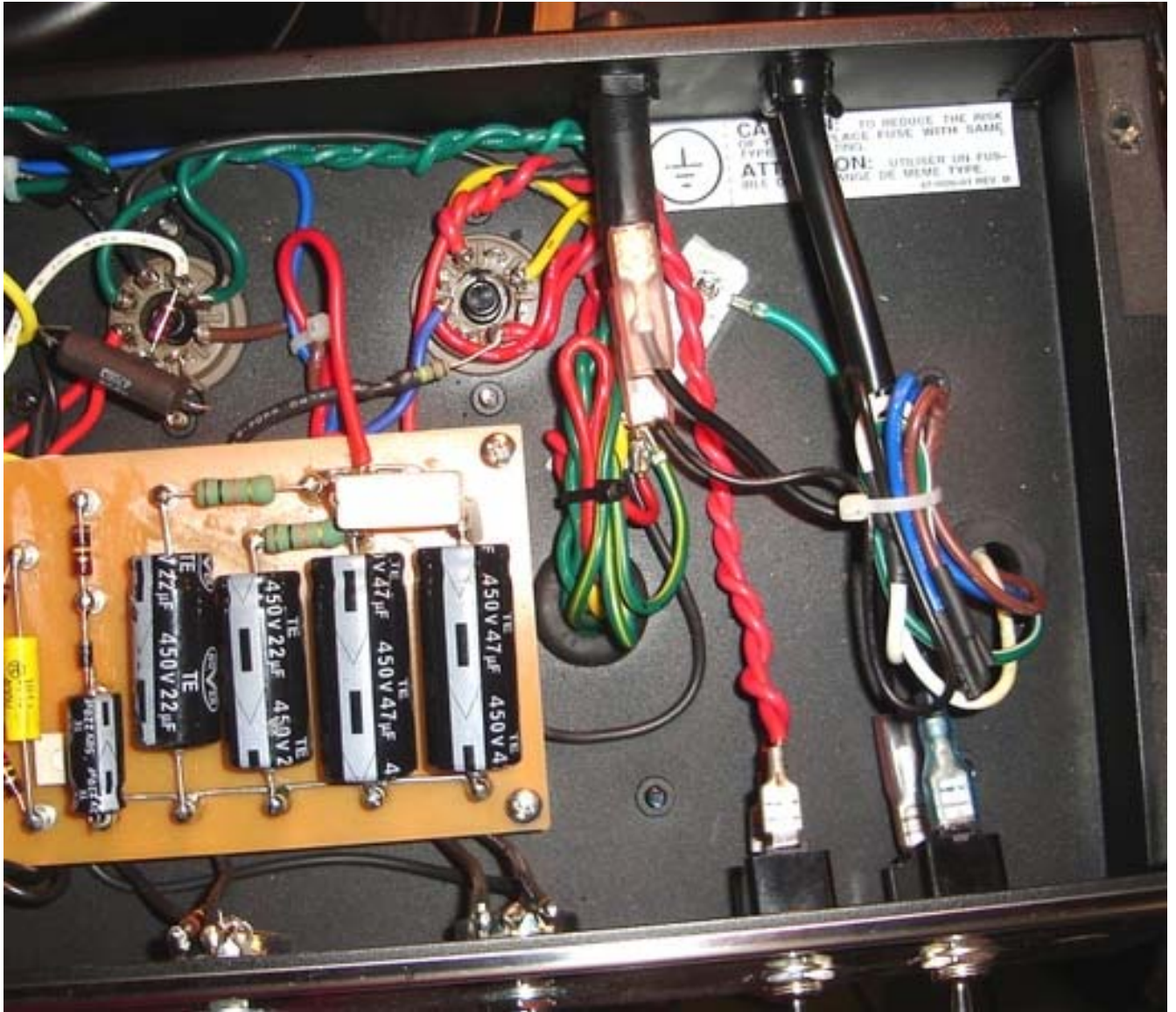
Note in this picture the Standby switch terminals are circled, also circled is a terminal on the rectifier socket; and finally there is an arrow pointing to transformer bolt that serves as the ground location.

I disconnected the wires from the switch, removed the red wire from the rectifier socket and removed the nut on the transformer bolt and removed the green wire from the standby switch to the ground bolt. Then I clipped the spade terminal off the red/yellow wire from the power transformer center tap and added a new bolt style terminal to it, then attached it to the ground bolt and re-installed the nut and tightened it down. Then I added a length of new wire to the red wire I removed from the rectifier socket, and installed a new piece of wire to the rectifier socket at the same terminal where I had removed the other wire previously. Like so:



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Then I added new female spade terminals to both wires and twisted them together and ran them over and attached them to the standby switch. And here is the new & improved standby circuit:

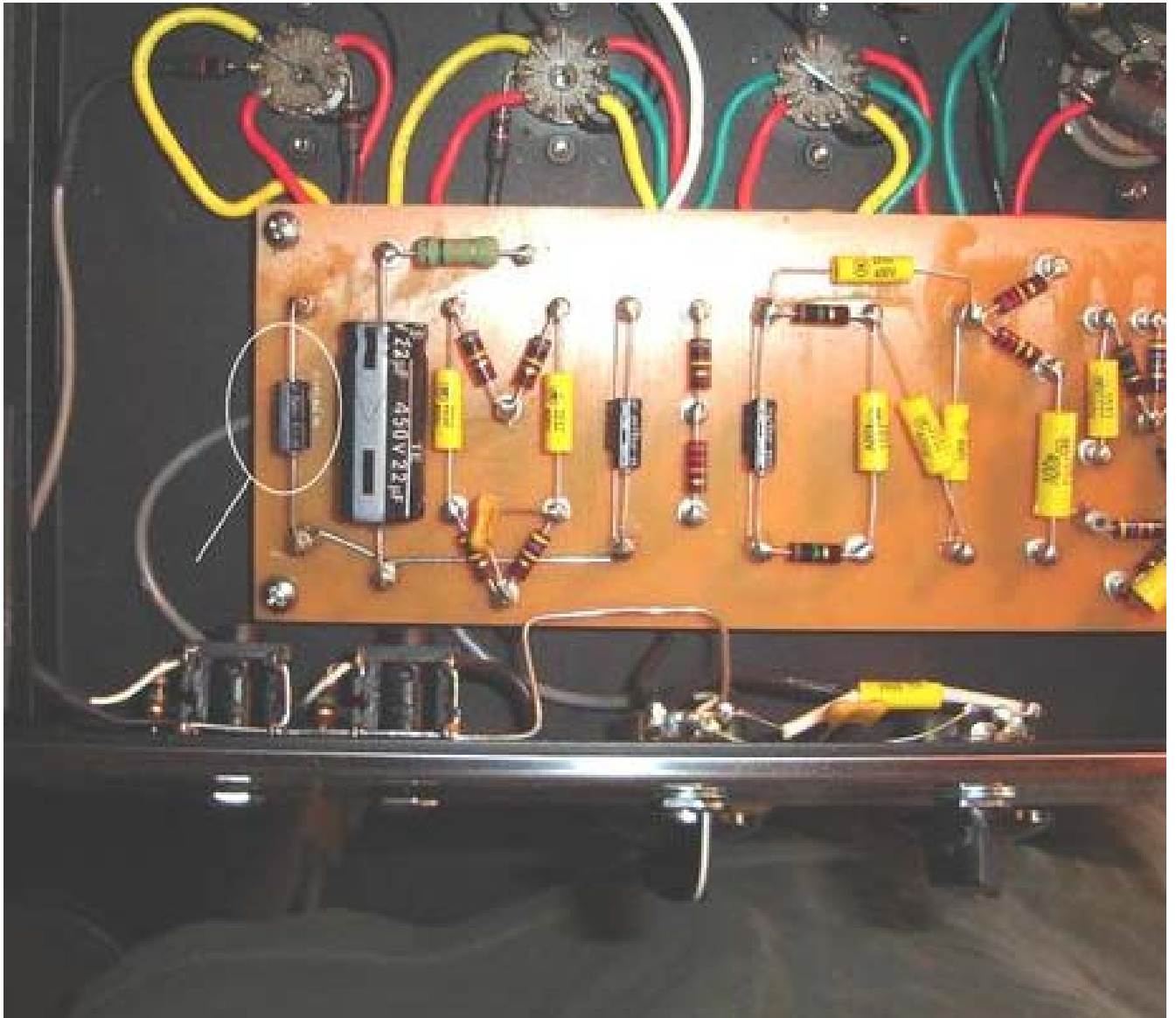


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3. Next up is a mod to cut some of the bottom end so the amp isn't so bottom heavy and flubby when pushed hard. This is pretty common for Fender style amps, which the J20 is (6G3 brown face Deluxe).

The 22uf bypass cap paired with the 1k cathode resistor gives a -3db low end rolloff around 12hz, way, way below what is even audible for a guitar amp. The heavy bottom end sounds nice when the amp is turned down low and clean, but when you crank it up the added bass frequencies overwhelm the circuit, causing the infamous Fender Flatulence condition. Swapping out the bypass cap to a lower value cuts some of this bottom end and reduces this tendency. There are lot's of opinions out there, folks like all kinds of different values, I like 4.7uf, which cuts the bottom end, but doesn't cut it all out. The -3db rolloff is still 52hz, which is still very full range. Some folks even say they can't hear a difference between 22uf & 4.7uf, I do, it makes a significant difference to me. But, this is all subjective, and whatever floats your boat is OK. To me the 4.7uf value cuts enough bottom end to reduce the tendency to fart out when pushed, yet retains enough to remain warm when playing clean, I like it.

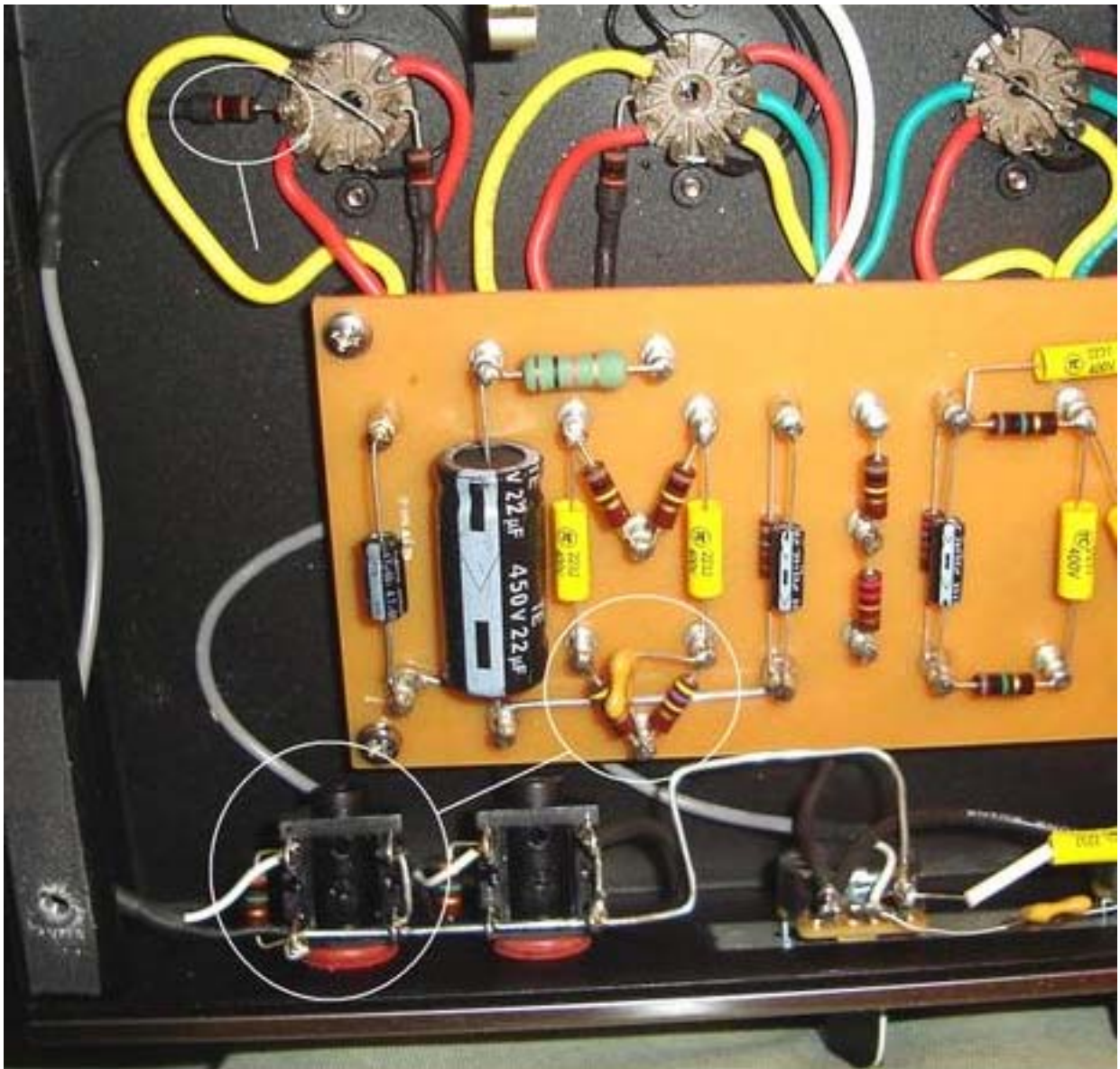
In any case, here is the cap you want to swap out if this is something you want to do (see photo on next page) :



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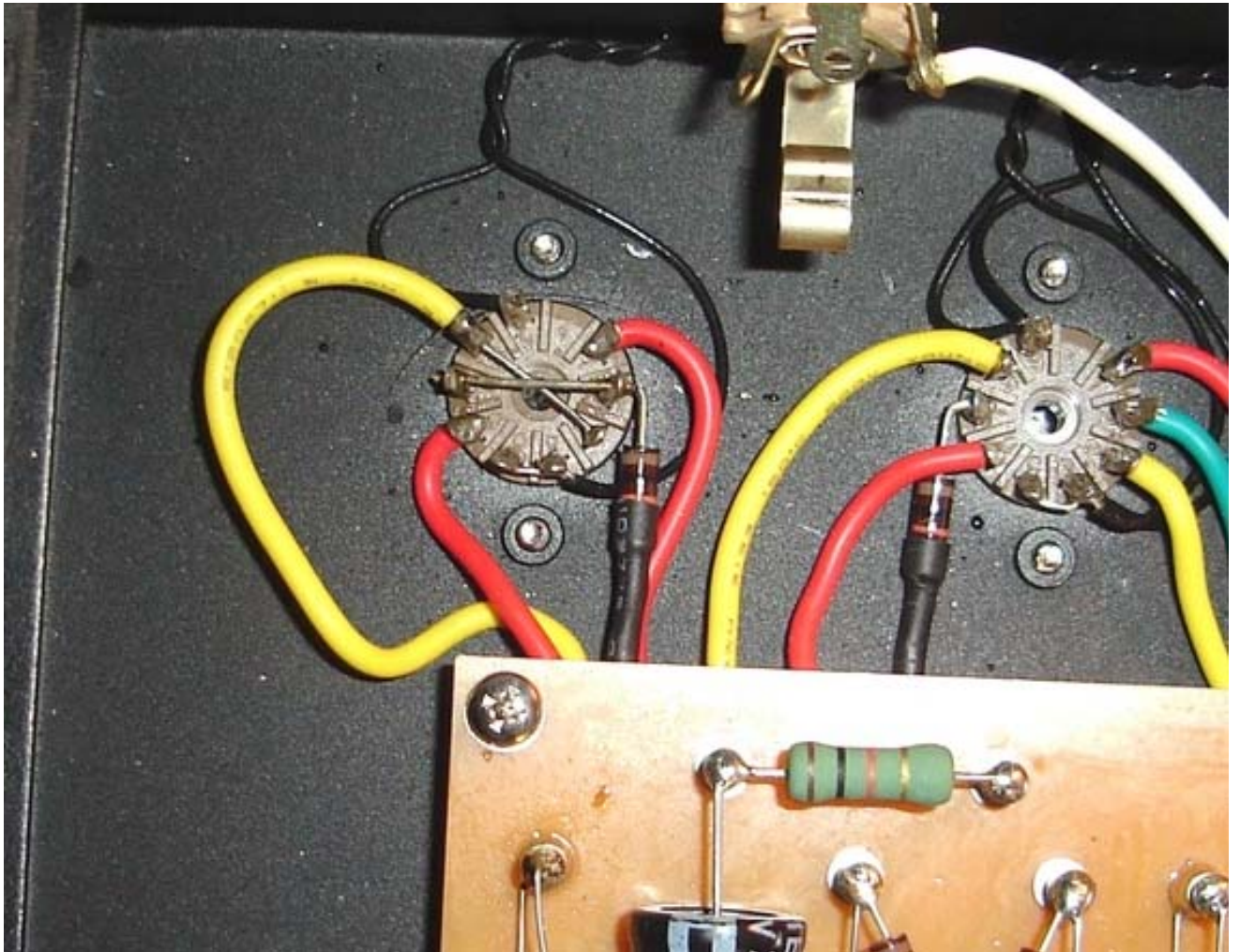
4. And finally, the input jack / channel select mod. I did this to make it easier to select between the two channels, I find it a bother to have to remove the plug and move it between jacks, it's much easier to just flip a switch. Also, as was noted by Obeid Khan, the designer of the amp, there is a slight noise issue caused by the way the two channels are joined while only one is active. This mod eliminates that noise issue, even though it is only slight. And one other benefit, the mod allows me to run both channels together.

OK, so here's how I did it. I removed the Normal input jack and the cable to the tube socket, and the grid resistor. See the pic below for a view of the parts involved.



To remove the jack you need to just clip the ground buss wire going to it and remove the retaining nut. Then remove the resistor at the tube socket and take the whole thing out together.

Then add a jumper wire to jump the grids of the two triodes at the socket. (see photo below)

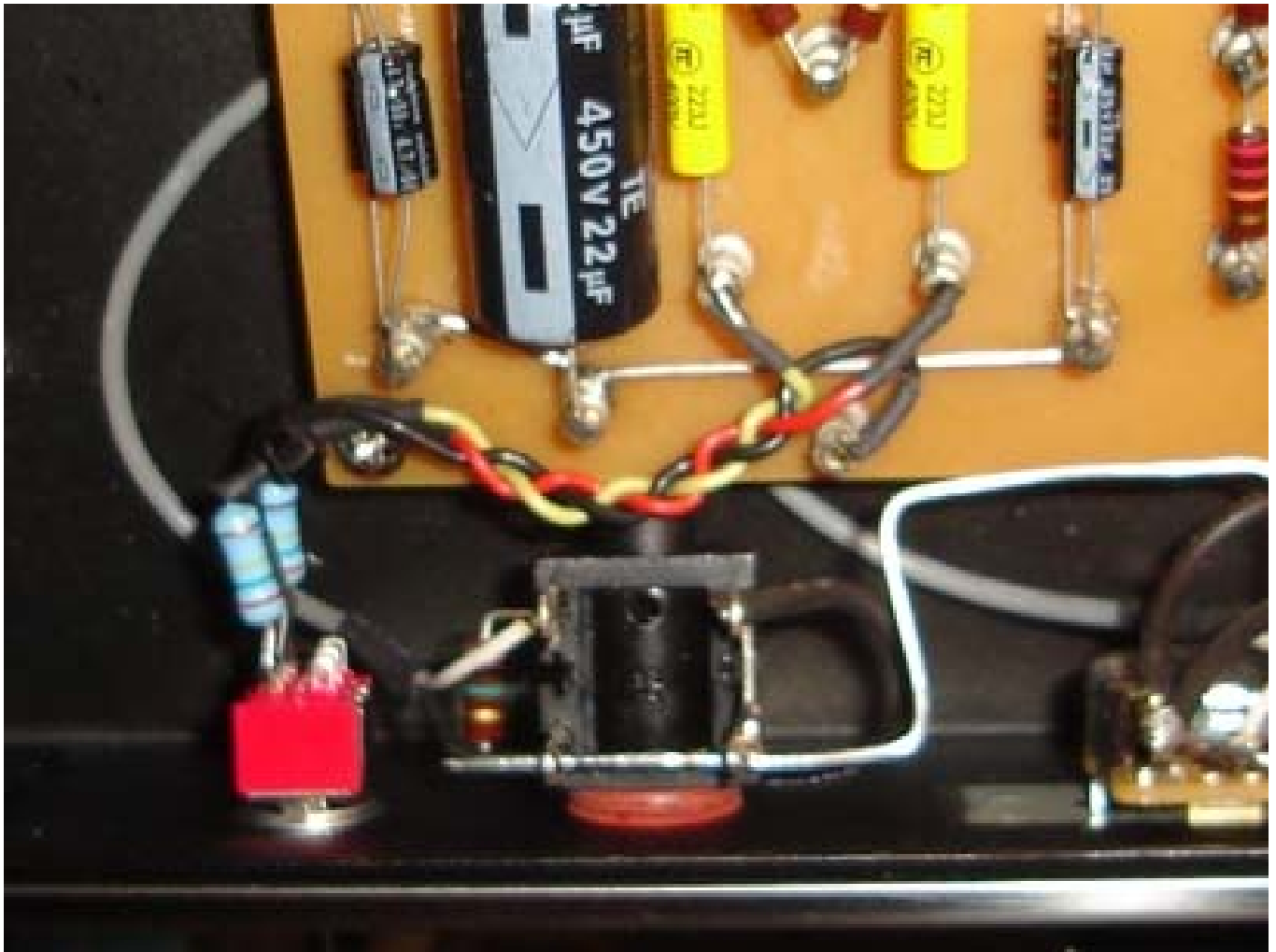


Then I removed the two 470k channel mixing resistors and the 470pf cap from the board. (these parts are circled in the picture on the previous page)

Then I wired up a mini toggle three position On, On, On switch with two new resistors and a new cap. Instead of using 470k resistors I went with 250k, which is closer to the value used in the 6G3 brown Deluxe, and to keep the same brightness value I had to change the cap to 1000pf. I wrapped the leads of the cap around one of the resistors before attaching it to the switch. The two resistors go to the two outer terminals of the switch, a plain wire goes to the center terminal. I used three different colors of wire to make it easier to tell which is which after twisting them and running them back to the board.



Then I installed the switch into place on the front panel, using some flat washers between the standard switch washers and the panel because of the larger hole, and ran the wires to the board and soldered them to the turrets. The two wires with the resistors go to the two outer turrets that also contain the coupling caps. The wire from the center terminal goes to the center turret, the empty one. And it looks like this: (see photo on next page)



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And here's a view from the front:



And that's it. Now I can easily just switch between the two channels with a flip of a switch, making it much easier and faster, and with the ability to jump the channels and have them both on together adds even more flexibility. Overall it only adds ease of use and versatility and loses nothing except perhaps visual appeal, if the toggle switch does not appeal to your sense of aesthetics.

And I'm now very happy with the amp, it is more flexible and usable for me. The bottom end is now much tighter and smoother, less flatulence, the Standby works properly, and with the bias adjusted properly my tubes will last longer, and I can easily adjust it when it comes time to try some other tubes.

Hope you find this info helpful. If you have any questions shoot me an email and I'll help you out. If you need any of the parts shown give me shout, I can help you there too.ⁱ

ⁱ Richard Hassebrock 12/26/2009 permission to reproduce for non-commercial use only.