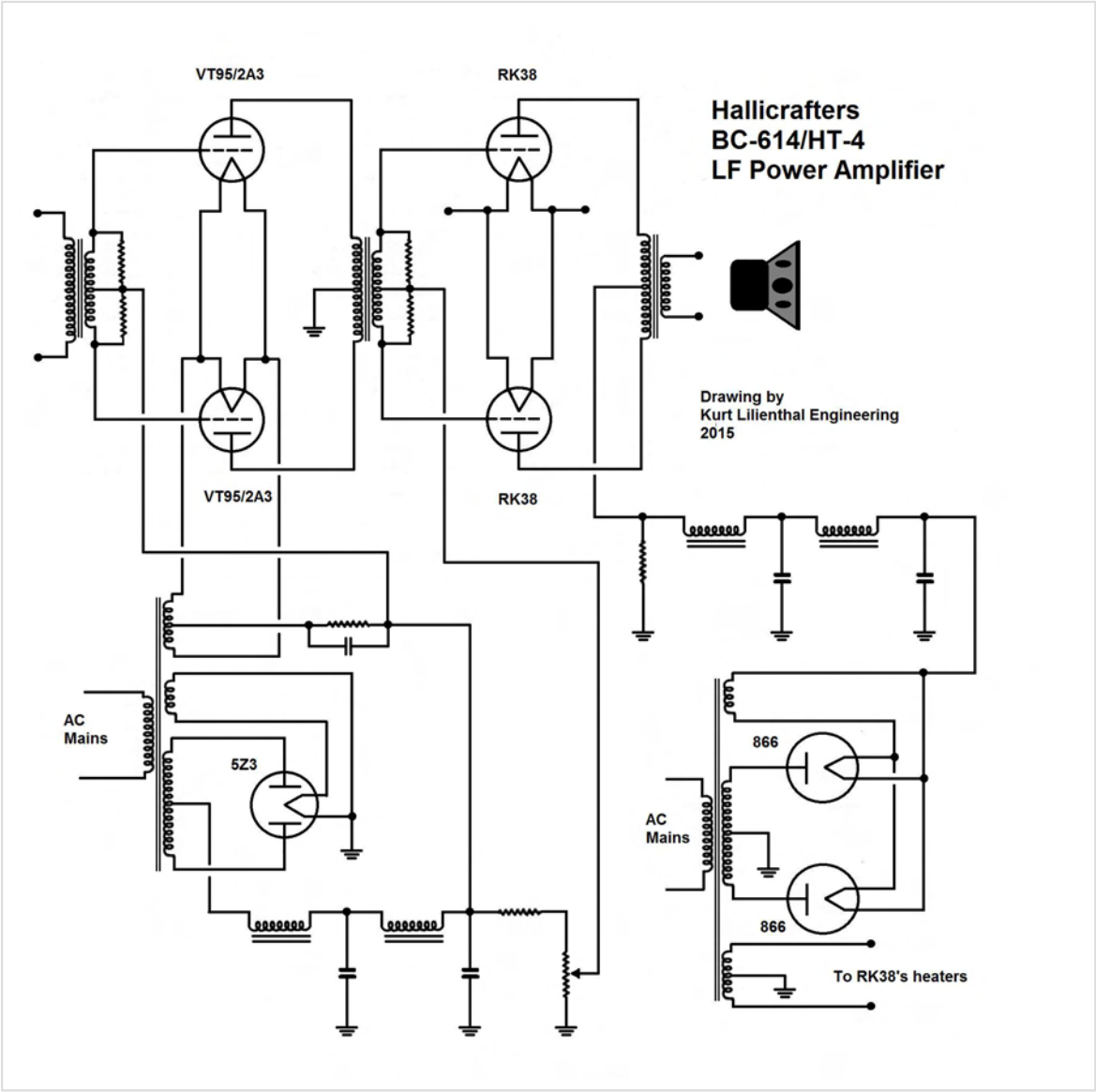

(Suggested by Joe Roberts)
Hallicrafters HT- 5 and
Hallicrafters BC-614 speech amplifier, WW2,

After a long search I found some info about these two amplifiers. HT-5 was an audio mixer amplifier made to drive the PA speech (Or modulator ?) for the BC-614/HT-4 system. BC-614 was a combined transmitter and PA-amplifier/modulator.

Very interesting (and exotic) pick, Joe…This set will bring you more than 300 Watt's class B. That ought to do it I guess. It is interesting that the 2A3 power amplifier are configured with negative Voltage compared to ground. Before you jump to any conclusions about the advantages or disadvantages about this, keep in mind that the tubes do not know the difference. The cathodes are the absolute references and therefor it works exactly as normal. The reason why Hallicrafters performed this little trick was that they needed a good power supply for the negative bias to the RK38 grids. And simply in order to spare resources they wicely chose to use this PSU for the 2A3 power amplifier as well. Nothing more, nothing less. After all this amplifier are pretty conventional – except for the high power. We can actually "back engineer" the whole mess. RK38 is a Thoriated

Tungsten filament, Tantalum plate high u triode capable of 100 Watts of plate dissipation. The maximum plate Volts are given as 3000 Volts. Heaters are hungry 8 Amperes at 5 Volts. A typical class B audio freq set up is as follows:

Plate Voltage : 2000 Volts
Bias: – 52 Volts
Idle current: 35mA
Plate to plate load:16000 Ohms
Peak to peak drive:360 Volts
Power max drive: 6 Watts/40mA grid current
Power out: 330 Watts

I will bet my favorite triodes that this is exactly what Halli's are doing. (+/- 20%)

The 2A3 stage would be a regular class A – some 300 Volts and 5k Ohms load. It only needs to deliver 6 Watts, so you can run it pretty much how you like.

"Why" – you may ask, "why the heck does Joe like an old dusty class B, WW2 military speech amplifier" ? (Good question, thank you) Well, I can not speak for Joe, but I believe I know why. First of all, despite being a class B amplifier the first few Watts from this monster are actually genuine direct heated triode class A. Secondly, there is not a single capacitor in the signal path and that can be heard. The power supplies are well regulated; choke input plus another smoothing choke for the 2A3 stage and mercury double choke smoothed for the RK38 power amp. Finally inductors (transformers) are in practice the optimal load for any tube as it forces the distortion down (compared to a resistor load) and the transformer responds to the current by "kicking back" as much Voltage as the tube could ever ask for. On top on that the DC idle Voltage losses in a transformer/choke load are only what amounts to the copper resistance of the winding wire. Of course a class A output would be better and I am pretty sure that either extreme end of the audio band are ignored in the speech amplifier. After all it was meant as a tool of spitting angry orders to your men at safe distance during WW2 – or something like that.

Anyway – damn interesting design, thank you for drawing our attention to that odd amplifier, Joe.