Subject: Re: Audio Note power transformer
Posted by Thermionic on Mon, 28 Apr 2008 10:11:36 GMT
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Hi Wayne,Sorry for taking so long to respond! I've been so busy lately I haven't spent very much time online.All other things remaining constant, just going from M19 to M6 will make for a significantly cooler running trafo than using the next gauge larger wire on the high voltage secondary. In many cases, you simply can't fit the correct number of turns of larger diameter wire into the window anyway. Transformer builders have detailed charts that tell them how much core they need to carry a given volt-amp rating, as well as charts that tell them which size wire to use for the application. Many builders use M19 when possible to save the customer some money. In some cases, however, it may be borderline iffy as to whether or not M19 will work in a certain application, and there's only one way to find out for sure. If it gets too hot when bench-tested under full load, they pull it apart and restack it with M6. Problem solved, provided everything else was designed correctly. Your Kit 2 has quite a high secondary voltage and draws a good bit of current as well, plus a significant power tube filament current draw. And, it has two separate filament windings. All that adds up to a WHOLE lotta wire, and I'd guess from looking at the size of the power iron that it's probably stuffed to the gills already. Actually, it may already have M6 lams, in which case you're just kinda stuck. You of course can't have a trafo built on a thicker stack, or go up to the next lamination size, because it wouldn't fit your existing mounting holes. IMHO, your best bet would be to get a Hammond 166N6 filament transformer (under $20) to run your power tube heaters from. The 166N6 is fairly compact and wouldn't eat up a lot of real estate inside the chassis, and would take a big load off your power transformer. A very good example is a set of paralleled SV83 monoblocks I just finished, using the same power transformer I use on some of my EL84 integrated amplifiers. The high voltage secondary and rectifier filament windings see precisely the same current draw in either amplifier. The only difference was that in the monoblocks, I used a regulated DC filament supply operated from a separate transformer, because they were to be used on 104dB efficient speakers and had to be silent at all costs.The transformer runs fairly hot in the EL84 integrated amplifier, where it also powers the filaments for two EL84s and a 6922. You can put your hand on it and keep it there, but it's quite uncomfortable to do so for more than a few seconds. In the monoblocks, the same power trafo runs nowhere even near hot. It barely even gets warm at all! This demonstrates the core loss/heat gain thing very clearly, as the DCR of a typical 6.3V @ 3A or 4A secondary might only be a couple tenths of an ohm. In your Kit 2, the I^2R heat gain would only be $3.2^2 \times .2 = 2.05$ watts of heat. Only 2 watts of DCR heat production is saved by moving the 6550 heaters to another trafo, but a lot of core loss heat production would be saved.Thermionic