This is the circuit I'm working with:
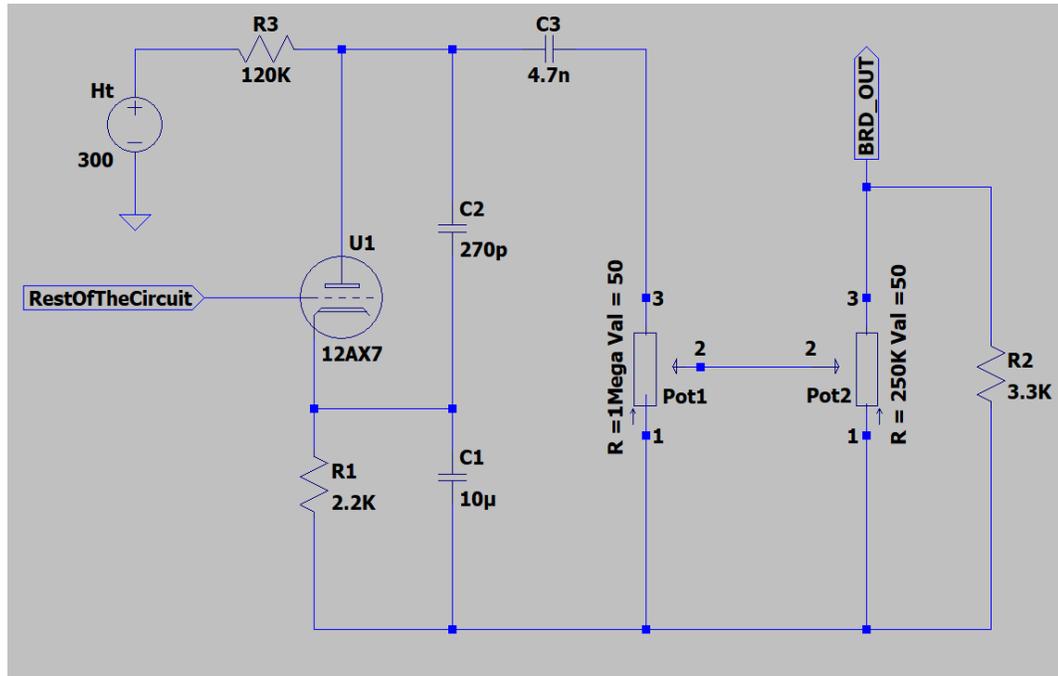

I'm using the book "Designing Valve Preamps," by Merlin Blencowe as a reference.

What I have tried:

1) Connecting a resistor to LTSPICE circuit and finding its value at 50% output gave the output impedance around 3250 ohms.

2) The author mentioned that theoretically if you were to feed 1V signal into the output, the ratio between the forced voltage and the current drawn will give you the output impedance. This gave me again around 3K3 ohms.

3) I have replaced the potentiometers by fixed value resistances, and simplified the circuit as shown below:
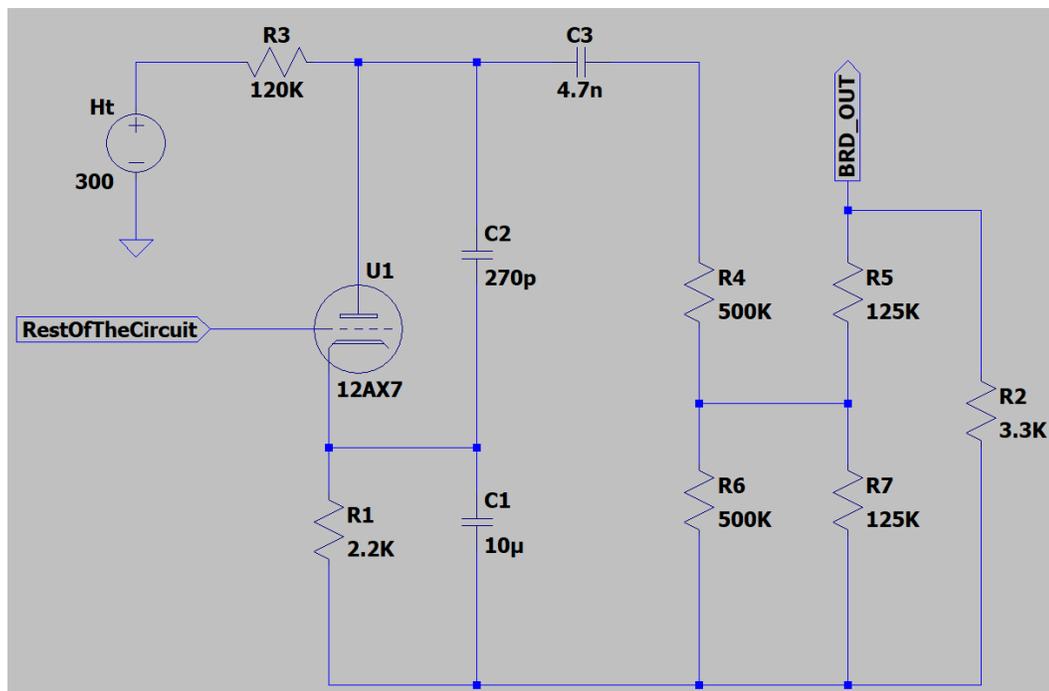
After a simplification and Y to Delta conversion of the resistances it becomes:

R3 120K C3 4.7n R2 554752.52 R4 1806.83 BRD_OUT
Ht 300
U1 12AX7
RestOfTheCircuit
C2 270p
R5 1445.47
R1 2.2K C1 10µ R6 2.2K
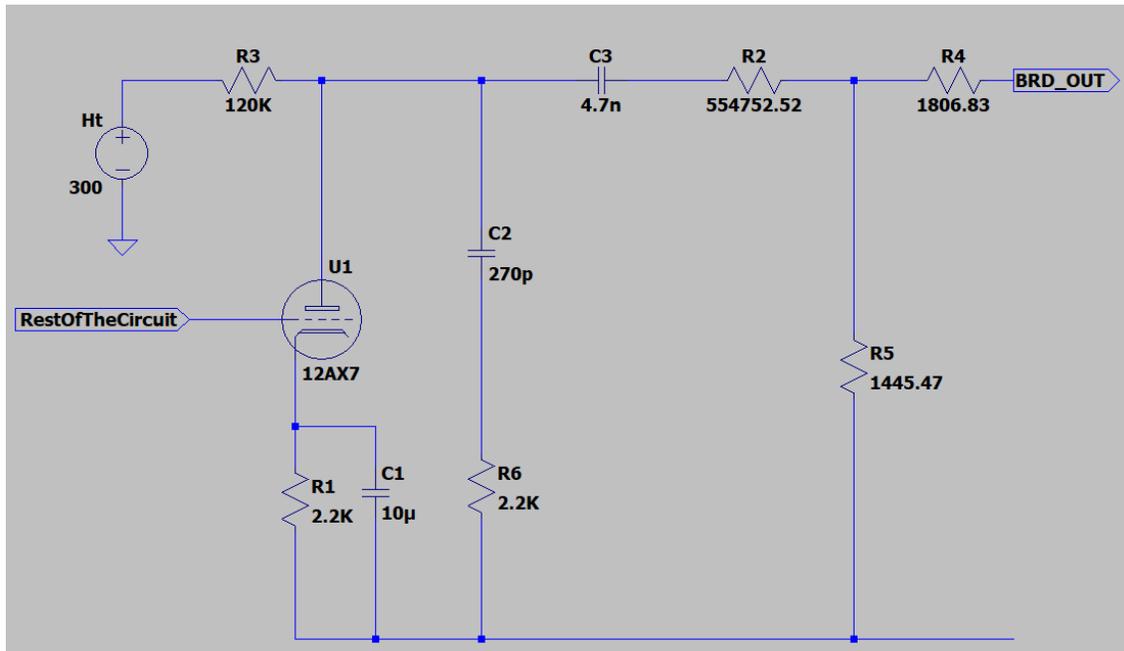
Then I have used Merlin's Thevenin equivalent for the gain stage (page 31), I tried both for bypassed and unbypassed cap, what resulted in:

C3 4.7n R2 554752.52 R4 1806.83 BRD_OUT
ra 100K
Rk 2.2K Ra 120K
C2 270p
R5 1445.47
u*Rk 176K Rk 2.2K
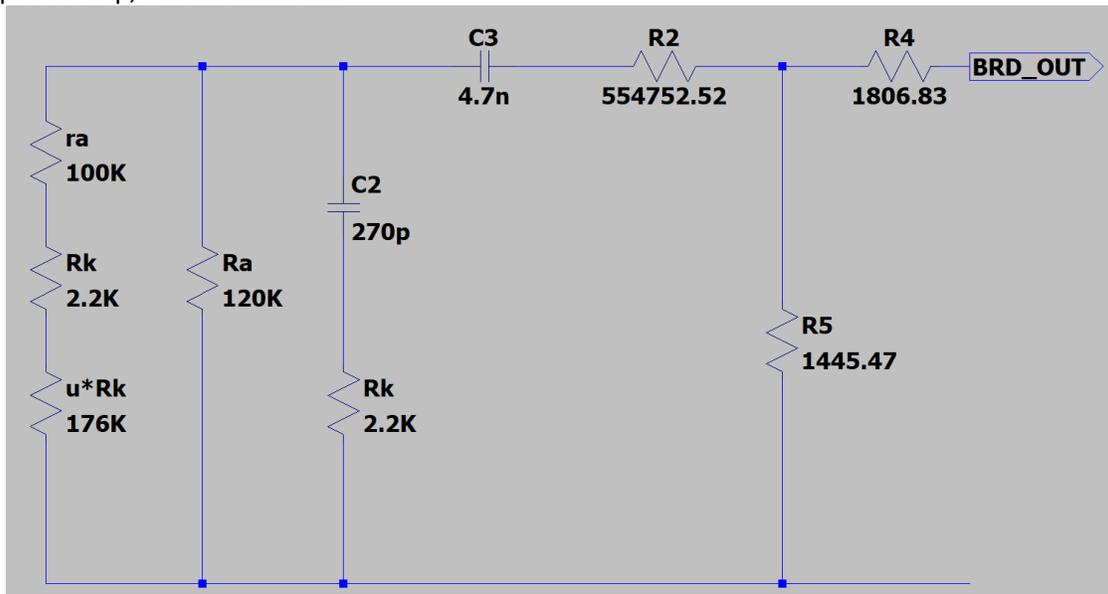
Now, coming to basic circuit analysis, I have tried 2 ways:
1) set all capacitors as short circuits, 2) treat the capacitors as complex impedances.
both those ways resulted in a total impedance of around 3K3 ohms.

This is impossibly low since It means the signal transmitted almost ideally to the amp. However, when connecting it to a high Z input and attaching a cathode follower in between, the sound seems to have more "breathing space".