Subject: Re: Identical gain & tonality in double-triode tubes (ECC82)
Posted by kasperbergholt on Tue, 14 Dec 2021 17:19:37 GMT
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positron wrote on Tue, 14 December 2021 01:08kasperbergholt wrote on Mon, 13 December 2021 10:52Dear tablers,

Inspired by the excellent feedback (e.g. on the E80 CC tube having quite different specs from the ECC82) the I got in this thread:

https://audioroundtable.com/forum/index.php?t=msg&th=23320&goto=94872&

some new questions have shown up in regards to gain levels for a single tube preamplifier like mine.

Which parameters determine the level og gain?

Some measurements are extremely detailed, e.g. this one from an eBay listing:

Sollwert IA [mA] fx 10,5 og 10,5
Messwert IA [mA] fx 10,012 og 9,945
= % vom Sollwer 95 og 95%
S (mA/V] 1,92 og 19,96
bei Deltage UG1 0,6 og 0m6
D Anode [%] 6 og 6,1
Messwer IA [mA] 7,2 og 7,13
bei UA [V] 225,08 og 225,08

Ri [KOhm] 9,1 og 9

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A different listing for a tube in the same price range is a lot more sparse:

ECC82 TELEFUNKEN (12AU7 E82CC CV400) # <> # NOS
gemessen auf RPM370
12 / 12 mA 100 % = 10,5 mA

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Most list the mA values, few the Anode value.

In addition, is there a formula for calculating if the difference between values will be noticable e.g. in a 1 dB's difference in volume measured from 1 meter from the loudspeaker?

And, lastly, how about differences in tonality / frequency response. Are such inherent in the gains measurement (or other parameters)?

Thanks again,

Kasper

Hi Kasper,

There are a couple of ways to check for the gain of a stage.

One is: Av = -Mu x RL/rp + RL

Where Av is the gain
Mu is the mu of the tube.
RL is the plate resistor
rp is the plate resistance of the tube.

Another equation is: Av = -Gm x rp x RL/rp + RL

Gm is the transconductance figure.

Mu, Transconductance (Gm or ma/v), Plate Resistance (rp), and even the plate resistance (RL) varies some.

Altering the rp, RL, Av will affect the high frequency response. The extent will depend upon said values resistances, load resistance, and capacitances involved.

The cathode resistor (Rk) will provide negative current feedback, if not bypassed, which also affects the gain and frequency response (fr).

Hope this helps, cheers.

pos

Hi Positron! Thank you! My mathematical understanding is not good enough to grasp the calculations, but I appreciate the feedback. :)

When you buy tubes, which parameters do you look for or ask for? And what would be considered an acceptable difference?

I see a lot of eBay listings mentioning 'balanced', 'matched' or 'measures strong', and some mentioning mA values and a few mentioning a lot of measurements like the one I mentioned previously in this thread.

Thanks again,