
Subject: Re: Identical gain & tonality in double-triode tubes (ECC82)

Posted by [positron](#) on Tue, 14 Dec 2021 07:08:20 GMT

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kasperbergholt 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: $A_v = -\mu \times R_L / r_p + R_L$

Where A_v is the gain

μ is the mu of the tube.

R_L is the plate resistor

r_p is the plate resistance of the tube.

Another equation is: $A_v = -G_m \times r_p \times R_L / r_p + R_L$

G_m is the transconductance figure.

μ , Transconductance (G_m or ma/v), Plate Resistance (r_p), and even the plate resistance (R_L) varies some.

Altering the r_p , R_L , A_v will affect the high frequency response. The extent will depend upon said values resistances, load resistance, and capacitances involved.

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

Hope this helps, cheers.

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