Subject: Optimal settings for 6P3S-E output tubes in Leben CS-600(X)s
Posted by kasperbergholt on Fri, 06 Oct 2023 12:38:47 GMT
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Hello forum,

I'm back again, still being on a journey to understand tubes & tube amplifiers :)

Back in April I got valuable feedback on 6CS7 tubes for my Leben CS-600.

This time I've got a couple of questions regarding output tubes.

The CS-600 can be configured to use a variety of output tubes through two switches, among them

The two switches are:

1) 'Plate voltage,' which can be set to either 350V/DC or 410V/DC.
2) 'Cathode resistor' can be adjusted to 680 ohms or 460 ohms.

Both switches can be set either up or down. According an overview of settings for different types of output tubes - of which 6L6, KT77, &L&GB, 350B, KT66, KT88 and 6550A tubes can be used - switches can either both be up or left one up and right one in the down position for the 6P3S-E variant.

Overall, I'm interested in the best sound quality, but I'm also concerned about the longevity of the

I'm thinking there might be a trade-off between the two?

Huge thanks in advance! :)

Subject: Re: Optimal settings for 6P3S-E output tubes in Leben CS-600(X)s
Posted by gofar99 on Sun, 08 Oct 2023 02:37:13 GMT
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Hi, Possibly a try and listen deal. The tubes you have listed will handle the 410 without any issues and the cathode resistors would alter the current. For the best sound it is not possible to guess what combinations would be best. But my experience has been that pushing tubes hard does not improve the sound. It also shortens the life span. In all my amps I use between 425 and 450 volts in class A push-pull ultra linear mode. I only adjust the current based on the tube type to keep the dissipation below 85%. At that level the tube life is quite long. My original tubes (JJ

KT88s) in the first amp from 2008 are still going strong after probably close to 8000 hours. They may out live me. I roughly list output tubes into four groups. All are in class A mode. Low power (5-10 watt PP/UL), medium (15-20 watts PP/UL), high power (25-30) and higest power (40-45 watts)

In the low power group are ones like 6V6, 6AQ5, EL84 and so on. the medium group contains 6L6GC, KT77, EL34 and similar ones. The high power ones are KT88 and KT90. The highest are KT120. I do not use KT150s as the actual power output over KT120s is usually not audible and they cost significantly more.

Fine so how to power them. All but the low power ones can run at 425-450 VDC. The low power ones in PP/UL should run in the 250-300 VDC range at typically about 40-45 ma each. The Mids run well at 60-65 ma each, the high ones at 90-95 each and the highest at about 130 ma. Great. What about sound? The really best sound of any is an odd setting. The KT120s at 62 ma with an 8K load. The sound is superb. Power output is down to 18-20 watts though. Plenty for my system. For the tube types you listed I would probably try 410V and 680 ohms first to see how it sounds, then try the lower 350V and 680. This is a nice range for dissipation for them and should give good linearity. The other resistor will increase the output a bit, but not so much that it would be noticeable (remember that loudness is not a linear function of power output). Let us know how it works out.

Subject: Re: Optimal settings for 6P3S-E output tubes in Leben CS-600(X)s
Posted by kasperbergholt on Sun, 08 Oct 2023 10:54:36 GMT
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gofar99 wrote on Sat, 07 October 2023 21:37Hi, Possibly a try and listen deal. The tubes you have listed will handle the 410 without any issues and the cathode resistors would alter the current. For the best sound it is not possible to guess what combinations would be best. But my experience has been that pushing tubes hard does not improve the sound. It also shortens the life span. In all my amps I use between 425 and 450 volts in class A push-pull ultra linear mode. I only adjust the current based on the tube type to keep the dissipation below 85%. At that level the tube life is quite long. My original tubes (JJ KT88s) in the first amp from 2008 are still going strong after probably close to 8000 hours. They may out live me. I roughly list output tubes into four groups. All are in class A mode. Low power (5-10 watt PP/UL), medium (15-20 watts PP/UL), high power (25-30) and higest power (40-45 watts)

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Thank you for the feedback & thoughts, it's appreciated - it was exactly something along these lines I was after.

Interesting point regardring the longevity of the KT88s. I might give a quad of these a chance some day - they seem reasonably priced.

Do you own a tube tester or are the 8,000 hours based on listening?

Most sources list 6P3S-E at minimum 5,000 hours.

Is there some synergy between the 4, 6, 8, 16 ohms setting of the amplifier in relation to the different settings for the output tubes?

Thanks again :)

Subject: Re: Optimal settings for 6P3S-E output tubes in Leben CS-600(X)s
Posted by gofar99 on Sun, 08 Oct 2023 13:57:54 GMT
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Hi, I have both a tube tester and use hour meters on the tubes it was up to 6200 before I moved it to the other amps. I still use it as my number two system and have accumulated many more hours. The extra 1800 was a guess.

There really should not be an issue with the output impedance as long as it is the one designated by the speaker company. What does matter is if you use a different one. The output transformer primary impedance is related to the secondary load impedance. If you use say a 16 ohm tap on 4 ohm load the primary impedance will be different than spec. Usually it is about linear so a for example an 8 ohm load on an 8 ohm tap will give you the correct primary impedance. If you put a 4 ohm load on the same tap the primary impedance will be close to 1/2 of what is was. This can be useful on occasion. If you need a 4K primary and have a 16 and 8 secondaries on a 8K transformer using the 16 ohm tap on 8 ohm speakers will be pretty close. The down side is that there can be response issues because of the way the transformer was designed respect to inductance and sometimes power handling ability.
