
Subject: Re: The next big thing

Posted by [gofar99](#) on Thu, 09 Jun 2022 19:26:11 GMT

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IT IS A BEAST

Now that I have your attention I want to discuss my latest creation. It is an all tube headphone amplifier. Because of a happy coincidence it has two modes. Low power, about 10 milliwatts into 64 ohms. High power about 750 milliwatts into 64 ohms. Your choice. How you say? It turns out that 6SN7, 6SL7s and 6AS7s share the same pin out. Better yet there is a sweet spot in SRPP use that allows all of them to run in the same amplifier. The driver stage can be either a 6SN7 or 6SL7 with corresponding gain levels. The output SRPP can be either a 6SN7 or 6AS7. The 6SL7 just doesn't have enough current to directly power the headphones. The output is capacitive connected and there is no global negative feed back. Surprisingly, the response is rather similar regardless of the output tubes. With the phones I have (AT ATH-MSR7 and Sennheiser HD260s) the low power level is really quite sufficient. Actually a lot more than they need. The sound is clean and low distortion (see chart). The hum and noise is really low. The scope shows only tube hiss at a consistent wide band level. I grant that this is not a simple project, but I consider it one worth while if you use headphones. The power supply is really important in this build as even small levels of hum will be awful. It uses a toroid transformer available from Antek at modest cost and I used the steel cover for it. That might be unnecessary but it looks cool. The power supply is full wave with several filter sections. The last one is a FET capacitor multiplier. I used a number of poly type caps at first but had to add an additional electrolytic in one section. You can probably use all electrolytics with poly bypass capacitors and get the same results. The heaters are elevated by about 1/3 of the B+. The B+ with all 6SN7s is about 260 and is about 200 with the 6AS7s outputs. If you use the 6AS7s be aware that they have high current heaters. About 2 amps each. The difference in B+ current is from 5 ma for the 6SN7s to 65 ma for the 6AS7s. I would expect higher power output level with phones that are over 64 ohms.

DATA

6SN7/6SN7 at 64 ohms load 0.5VRMS (about 4 milliwatts)

S/N -80 dbv

20HZ distortion at 100HZ, 1KHZ, 20KHZ below 0.5%

20HZ to 20KHZ +0/-0.6db, -1.3 db at 100KHZ

6SN7/6AS7 at 64 ohms load Max output is 7 volts RMS

S/N -76 dbv

20H to 20KHZ +0/-0.7 dbv

Distortion at 1000HZ at 1 volt (15mw) 0.38%

2 volts (65mw) 0.7%

3 volts (140mw) 1.05%

4 volts (240mw) 1.2%

6 volts (560mw) 2.8%

7 volts (760mw) 3.7%

NOTES

All distortion measurements made on a HP Distortion Analyzer

Source is a Tenma signal generator with a residual distortion level of 0.25%

This combination results in distortion values that are likely higher than indicated
The load in all cases was a non-inductive 64 ohm resistor
Signal to noise levels were obtained from a PC scope in spectral analysis mode

File Attachments

1) [6AS7 Phone Amp June 9 2022.jpg](#), downloaded 403 times
