

## **L'Amp: A Simple SIT Amp (CCS Addendum)**

by

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### **L'Amp Gets Activated**

So, hopefully you've had a chance to check out the second part of the L'Amp article, which uses the stored energy in a coil's magnetic field to improve efficiency, and its inductive reactance to boost the gain a little. I think it's pretty neat, but I know a number of readers had their hearts set on something a little more active, and maybe a big passive coil of wire just isn't your idea of a good time.

I'm really enjoying the passive versions of the SIT amps, but that doesn't mean I haven't tried other things, and I have found an active current source that, IMO, provides good subjective performance, measures well, and is easy to implement.

I tried all the current sources in Figure 1. (A) and (B) work fine, but they can be a little tricky to dial-in just right, especially if you don't have a distortion analyzer.

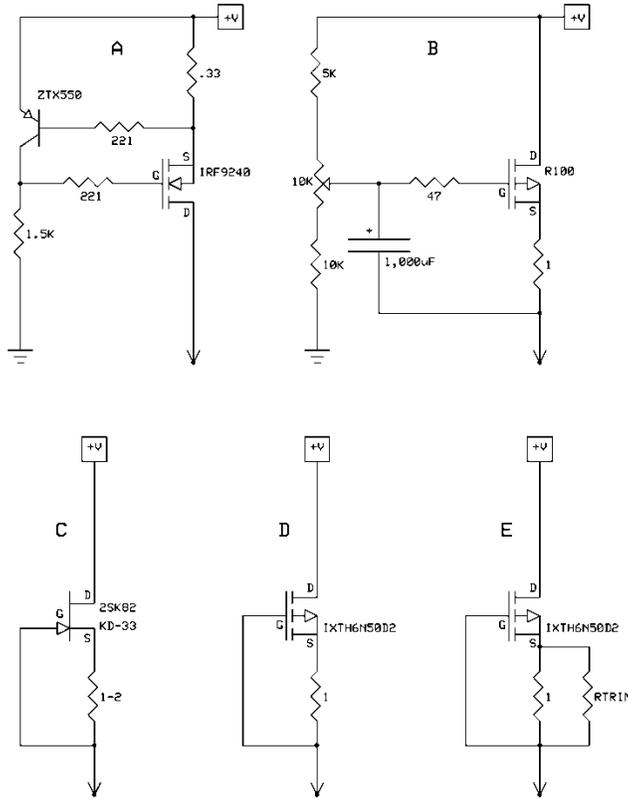


FIGURE 1

Then, I thought using another 2SK82 sounded like a fun idea (C), but it doesn't have a lot of transconductance and didn't make a very good current source in this circuit.

So, I tried (D). It uses a self-biased IXYS depletion mode MOSFET IXTH6N50D2.

I apologize for the simplicity.

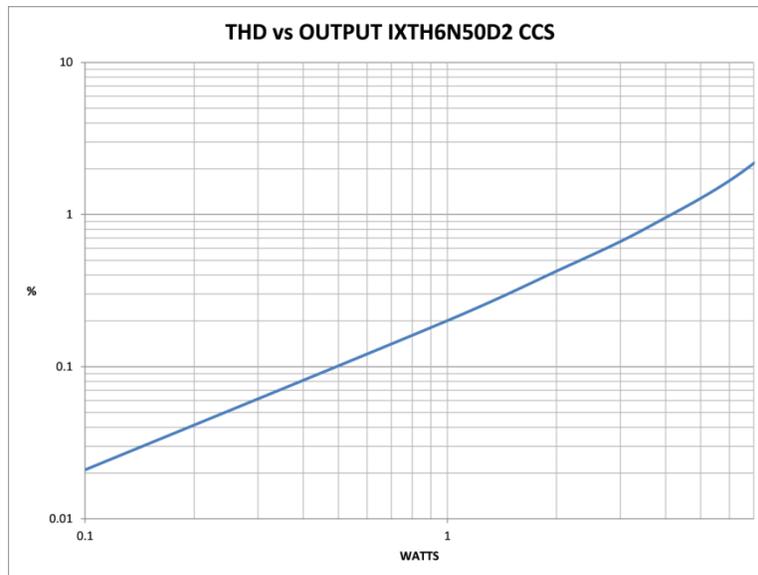
But, lest we think this simple solution won't deliver the goods, let's take a look at how it *actually* performs.

Noise is typically 50uV, or less, un-weighted 22Hz-22kHz, 8 Ohms. That's about 300 trillionths of a Watt.

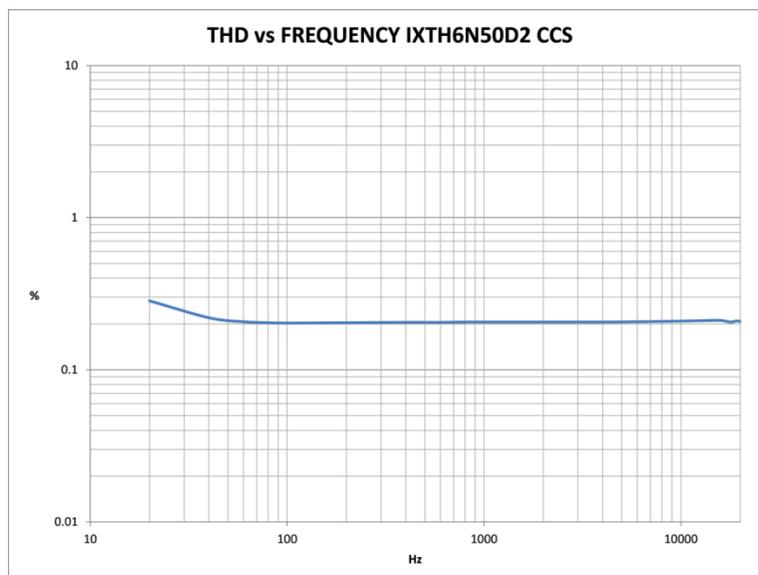
Gain is now around 8dB.

The frequency response is -.17dB at 10Hz and -.22dB at 100kHz.

THD vs. Power looks like this:



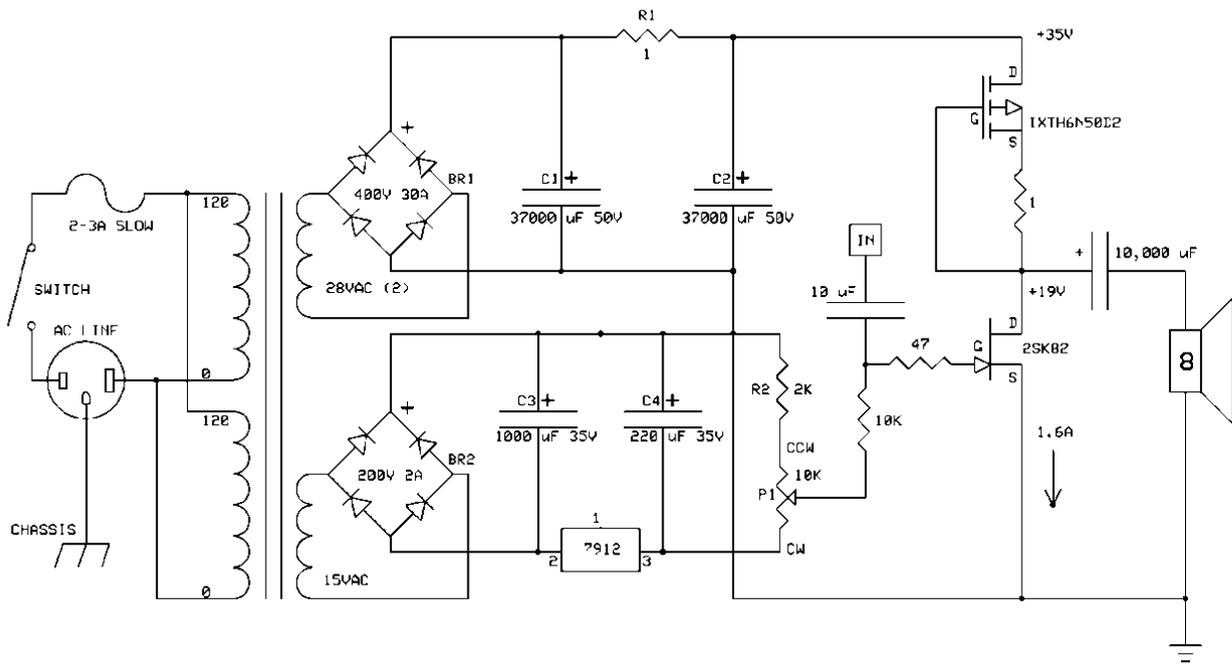
THD vs. Frequency looks like this:



That's super-flat across the audio spectrum, and a nice improvement over previous circuits.

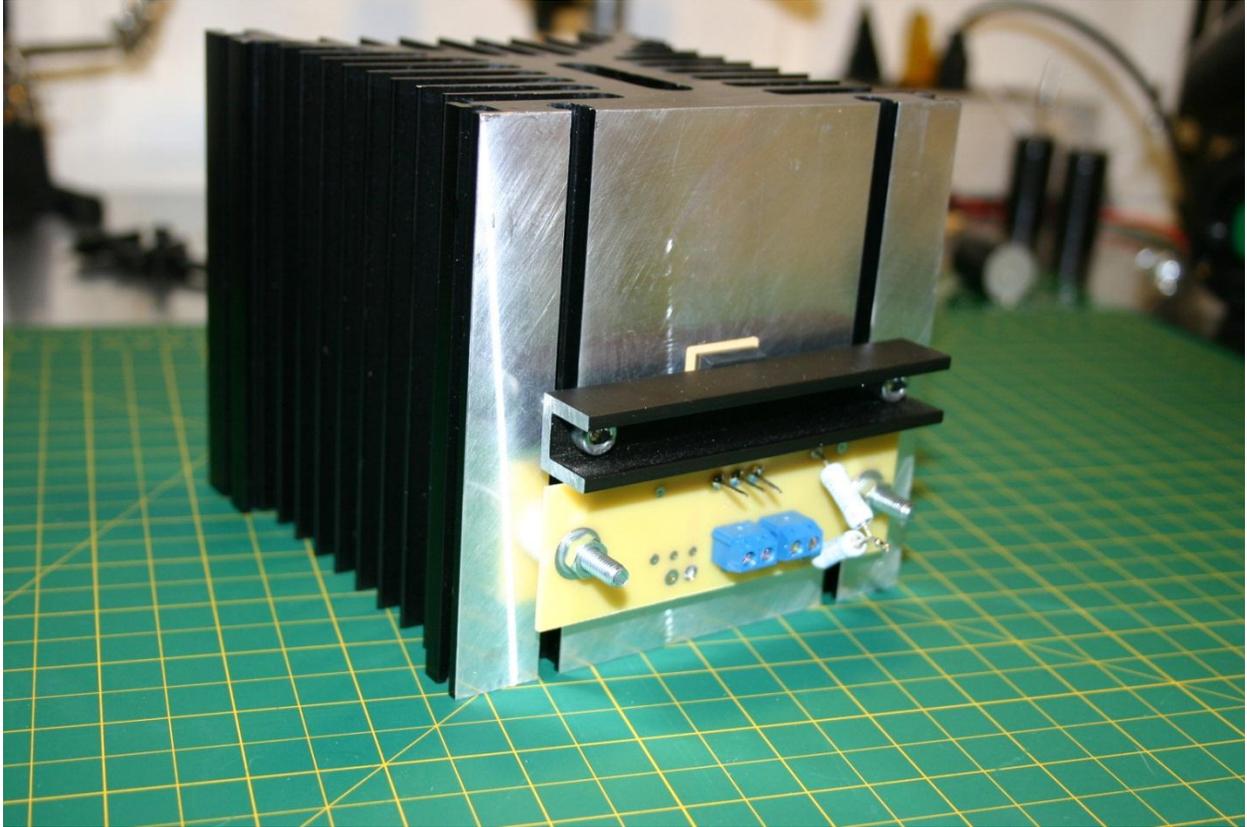
Oh, and did I mention best Rickie Lee Jones vocal ever?

Finally here's the complete circuit as used in these tests:



I used the power supply from L'Amp: Part Deux, so you can just build the current source on a heat sink, and stick it in where the inductor went.

I adjusted this amp by turning P1 fully clockwise (-12V), then I turned the amp on and adjusted P1 counter-clockwise until I had about 19-20V across the SIT @ 1.55-1.6A, which corresponds to 1.55-1.6V across the 1 Ohm source resistor. After the amp has fully warmed-up, I make the final adjustment. Ideally, your transistors would be gain-matched, but considering the prices, that's probably out of the question, so just put your balance control to work and stop worrying so much.



You can build something much fancier if you like, and some really spiffy current sources have been posted by Salas and others in the L'Amp thread at [DIYAudio.com](http://DIYAudio.com). Perhaps, like me, the simple aesthetic will appeal to you, but I encourage you to try other things if you're so inclined. I offer this as a simple and satisfying place to begin your journey.

Thanks to Nelson Pass and my friends at [DIYAudio.com](http://DIYAudio.com).

Now go build something!

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