
Subject: Re: Why SE in [all kinds of Class A] amps?
Posted by [Wayne Parham](#) on Mon, 16 Nov 2009 19:10:43 GMT
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For a few years, I was working under an impression that tube amps distorted more than solid state amps, but that perhaps tube distortion was more "euphonic" than transistors because lower order harmonics weren't as disagreeable as higher order harmonics. As an example, something that produces mostly second harmonics is definitely going to sound better than something that generates a sharp edged clipping sound with lots of very high harmonics. If nothing else, the spectral content is very different. But there is another thing to consider, and that's the fact that most tube amps use very different topologies than solid state. The circuit configurations are different, and is probably more responsible for low THD ratings on solid state amps than anything else.

I was talking with a guy that used to work for Svetlana a few years back, and he made the case that a triode almost always distorted less than a transistor with comparable ratings. The whole deal is really related to feedback. The transistor amps provided more gain, but then used feedback to reduce distortion. He claimed that the reason solid state amps distort less wasn't even the fact that they were solid state, but more the fact that they used a lot of negative feedback, which cancelled distortion. If you did the same thing with tubes, you'd get lower distortion still. But people don't do that because they don't have to - the distortion levels aren't objectionable. The main thing about tubes is you can't make as much power, or at least not cheaply. Higher power is the big advantage of solid state, not lower distortion. The distortion advantage is mostly from the topology, putting a lot of gain stages in and then using negative feedback.

I didn't bother to study this further, to try and confirm or deny this. Instead, I sort of took it as fact, although I guess I haven't really bothered to check. But it does appear to be reasonable to me. I do know that negative feedback reduces distortion, but also that once you've gone past the limits of the amp, once it is clipping, negative feedback no longer works - it can't. So negative feedback works well up to a point, and then completely comes apart. As far as whether or not a class A triode distorts less than a class A bipolar transistor or a class A FET, I suppose that is probably something that is different from device to device, and how far into the load lines you push them.