Subject: pi's and tubes, why different than sand?
Posted by Sam P. on Tue, 12 Nov 2002 16:21:09 GMT
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Finally, put my MC240 back in working order, and decided to run it awhile with the quasi-4 Pi Pros. The midrange subjectively is smoother and less forward than with the previous sand amps in use. Oh NO, not the dreaded sand vs. tube debate AGAIN. Wayne, how about a few words about the essential DIFFERENCES in how a sand amp's output voltage (does NOT change with load variations) might be expected to INTERACT with the reactive xover components. Is a tube amp LESS ABLE to deliver extra power into the reactive part of the load, perhaps ENHANCING the electrical effects of the Zobel for instance, in some manner depriving the drivers themselves of power at some freqs, particularly the xover region? PWK touched on this in one of his patents, where he implied that his xover design EXPLOITED sand amp characteristics specifically. Samthis is a "voltage source vs. current source" situation I think...wouldn't Spice simulations give different response plots for the overall freq. response of xover filters if one (Vs), rather than the other (Is) was specified?

Subject: Re: pi's and tubes
Posted by Matts on Tue, 12 Nov 2002 18:32:03 GMT
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No debate, dude. If you like your amp, enjoy it! Wayne happens to have some designs that are killer with certain tube amps, in addition to working with transistor amps. Let your ears be your guide!

Subject: Distortion behavior, signal-to-noise and output impedance
Posted by Wayne Parham on Tue, 12 Nov 2002 19:30:12 GMT
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You're right about the Zmax thing being a big determiner of speaker performance on tube amps, particularly the small signal SET's with large output impedance. And you're also right that the filters used interact with this output impedance - It's like putting a couple ohms in series with the circuit, so peaking raises a bit. The lower output impedance makes a better current amp, whereas the voltage amp isn't as concerned with output impedance. But the biggest area of interest is the mechanical resonance of the woofer and cabinet system, so that's why I recommend systems having woofers with low Zmax for owners of SET amps.Of course, I think the biggest thing that makes tube amp owners like 'em is their different behavior in distortion products, and in signal to noise ratio. The Zmax thing is definitely an issue in the bottom octave, and one that is extremely important to consider when choosing speakers for a small signal amp. But without making a

judgement for or against either technology, I think the biggest things that tube lovers notice are the difference between low-order vs. all-order distortion at clipping and the reduction of hiss.

Subject: Re: Distortion behavior, signal-to-noise and output impedance
Posted by BrianG on Tue, 12 Nov 2002 20:13:41 GMT
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Wayne,Putting the crossover ahead of the amplifier and bi-amping removes some of the problem for tube amps.Brian

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Subject: Impedance at resonance
Posted by Wayne Parham on Tue, 12 Nov 2002 20:42:47 GMT
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Definitely, that's true. Bi-amping and connecting the drivers directly improves motor damping from the amp, and also provides other benefits.But then again, the reactive components in a passive crossover and the reactive nature of the driver itself interact in a manner that is taken advantage

interaction between the driver and the crossover isn't wanted, and that's why conjugate filters are used. That's what a Zobel does and it's required in many cases.One thing about connecting the amp directly to the driver is that the amp is better able to provide electrical damping for the motor. But that depends on the amp having high damping factor. If it doesn't, as is the case with many tube amps, then the driver's impedance curve interacts with the amp's output circuit. Large impedance fluxuations can cause peaks and dips in response. Small signal tube amps are often coupled through output transformers with relatively high output impedance, and so even if the woofer is connected directly, its impedance at resonance forms a divider with the amplifier's output. Sadly, this is what causes the biggest problem.But that's not the case for tweeters or midrange drivers, only for woofers. This is because there isn't usually such high back-EMF from midrange and tweeters, and their crossovers almost never increase peaking to the levels of deep bass woofers at resonance. So particularly for midrange and tweeters, the issue doesn't become a problem.
