Subject: Do tubes have a resonance of their own
Posted by jp on Fri, 04 Sep 2009 06:39:24 GMT
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My preamp is Copland CTA 301 MK II , Tubes are E 88 CC , I purchased Mullard tubes but was very disapointed , lots of distortion , plus they broke after about 40 hours .I need avise on wich tubes I should replace the Mullard with ?
Do tubes have a resonance of their own ? I'm getting an annoying resonance in the midrange that causes the human voices to shout !!
I've tried all that is possible to make sure it's not coming from other equipment : Speakers , but it could be that it is reenforced by the speakers .
Really need to have very smooth sounding tubes in replacement .
Thanks
JP

Subject: Re: Do tubes have a resonance of their own
Posted by Wayne Parham on Fri, 04 Sep 2009 14:49:07 GMT
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Tubes have inter-electrode capacitance, and they also have internal inductance and resistance. All physical components have some amount of each of these properties, actually, but in most cases, the amount is small at audio frequencies. A capacitor, for example, is mostly capacitive but does have a small amount of internal resistance and inductance. A resistor is primarily resistive but has a small amount of internal inductance.

In my experience, tubes have more varyance between devices than most electronics components. I've had some tubes last years, others just months. They have varying degrees of build quality, and some even appear to have different internal vacuum, in that I can see a glow in some tubes that I think must be from residual internal gas. Not only is build quality different from tube to tube, but even the internal structural configuration is sometimes different. Since the physical relationship between each of the internal structures (plate, screen, grids, filament, etc.) is largely what sets the properties of the tube, these differences can be significant.

On that note, understand that the internal structures are pretty delicate and can be easily vibrated. This gives a chance for feedback in the form of what's called microphonics. Sound coming from the speakers vibrates the tube, which is transferred to the internal structures. This tiny movement changes the physical relationships between internal structures by a small amount, enough to change its characteristics. This manifests itself as a modulation of the signal, and since the signal itself is what causes the vibration (trasferred through sound travelling back to the tube), this is a form of feedback. Just like feedback through a microphone in a public address system can cause a shrill tone, so can something like this happen from tube microphonics.

Tap on the tubes gently and see if it results in a thump or loud ring in the speakers. If so, that may be your problem. Best solution is to isolate the tube, moving it away from the sound source. Some tubes are more microphonic than others - the internal structures may be different between manufacturers, and some may be supported better inside or at least more well damped. So you

can try different brands of tubes to see if you can find one manufacturer that works better for you. Some companies make sound absorbers, dampers that can wrap around the tubes.