Subject: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by Peter Krojgaard on Mon, 19 Mar 2007 10:55:01 GMT
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Hi,If the transition from a compression driver to a rectangular horn is less than optimal, where in the frequency band will this be most audible - and how?I ask because I use a pair of large rectangular 200 Hz mid/high horns for a pair of BMS 4592 ND drivers (I use this combo from 266 Hz and up). The throat transition is not a disaster, but it is not super smooth either, and I have some harshness in the treble (6-9kHz, I think) and wonder to what extent this harchness may be due to the non-optimal transition. Thanks!All the bestPeter

Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by Wayne Parham on Mon, 19 Mar 2007 15:13:20 GMT
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The closer to the throat entrance, the higher in frequency the effects will be.

Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by Peter Krojgaard on Mon, 19 Mar 2007 16:53:51 GMT
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Hi Wayne,Thanks a lot for your reply! To be more specific: In my horns the first 3/4 of an inch (the "adapter")is not flared at all, but resembles a "tube" (I hope it is possible to visualize my description!). After that, the circular entry is slowly (over a distance of app. 2 inches) converted to the rectangular form of the exponential horn. This transition piece is fairly smooth, but not perfect.Given your expertise, do you find it likely that a "transition" as described above would (or could) course harshness in the 6-9 kHz range (in my case, especially too pronounced s-sounds in female voices)?Thanks again Wayne!All the bestPeter

Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by Wayne Parham on Mon, 19 Mar 2007 22:02:39 GMT
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set by the length of the adapter. This is particularly true if the interface isn't smooth, or if the flare

boundary conditions.

Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by Cuppa Joe on Tue, 20 Mar 2007 00:46:54 GMT
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I know that the BMS 2" coaxials have a little frequency spike just above the crossover point of 6.3kHz with their passive network. You might try an active crossover, if you're not using one already.

Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by Peter Krojgaard on Tue, 20 Mar 2007 05:34:46 GMT
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Hi Wayne,Thanks a lot for your reply - helpful as allways! Your reply makes a lot of sense, thanks!RegardsPeter

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Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by Peter Krojgaard on Tue, 20 Mar 2007 05:37:45 GMT
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Hi Cuppa Joe,Thanks a lot for your reply. At the time of writing I use a passive crossover between the BMS mid and the BMS tweeter. Actually I have dampened the tweeter just above 6K as you suggest. I already use an active filter between my bass horns and the BMS, and maybe an all active solution is the way to go with the BMS.RegardsPeter

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Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by DMoore on Tue, 20 Mar 2007 17:15:42 GMT

That is very true. I had a pair of the Edgar Tractrix 500Hz wood horns (square throat) that worked outstandingly on the midrange frequencies, but beamed horribly (excrusiatingly bad) on the high end with the BMS 4590 coax drivers.I should have known better, but it needed to be tried since I had them.DM

Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by Cuppa Joe on Wed, 21 Mar 2007 01:50:46 GMT

If you biamp your BMS mid/tweeter sections, cross just a WEE bit below the passive's crossover point (6kHz instead of 6.3kHz), and really be careful about how much power the tweeter gets! The slightly lower crossover helps to tame that peak at 7kHz.

Subject: LC Peaking
Posted by Wayne Parham on Wed, 21 Mar 2007 04:25:29 GMT

Yes, I think that might be caused by LC peaking in the crossover. When capacitance and inductance are in the circuit, a resonant condition is formed. Without the right amount of damping, it can cause peaking. The electrical properties of the driver (including the transformations of acoustic resistance/reactance into mechanical resistance/reactance and eventually into electrical impedance) come into play as well.

Some people, including even some well respected speaker designers, consider a loudspeaker to be resistive, and estimate it as such when doing calculations. It is particularly inappropriate for horns because they are 1/4 wave devices that have several impedance peaks near cutoff. Since this is where they are likely to be crossed-over, it is important to consider the impedance of the horn in the crossover region. Even though a horn approaches pure resistance, it only does this well into its passband and only if adequately sized. Many times, horns are undersized to meet specific design criteria and the crossover point is almost always low in the pasband, so the horn's complex impedance near the low-frequency crossover point must always be considered for best results.

Each year, I give a seminar called "Crossover Electronics 101" at the Lone Star Audiofest. The main emphasis of this seminar is to familiarize people with reactive circuits, to show exactly how peaking can (inadvertently) creep into a crossover design and to show how to damp the circuit properly to prevent it. I present a series of slides with schematics and response charts that show what each circuit does. Then we connect each circuit to a horn tweeter and play sound through it,

listening to each one to hear how they sound. I think it's interesting for people to actually hear what various levels of peaking sounds like, and to compare different circuit types.

Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by Peter Krojgaard on Wed, 21 Mar 2007 07:22:48 GMT
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Hi Cuppa Joe,Thanks for your suggestion, I will consider going all active!RegardsPeter

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Subject: Re: LC Peaking
Posted by randle on Sun, 08 Apr 2007 03:06:20 GMT
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So let me ask you a question. This is something that I have been wondering for a long time. Me as an artist, someone who creats music wants to know, when composing a track,beat,song. Do the insrtuments play a huge part in the the collaboration with how speakers work?

Subject: Re: LC Peaking
Posted by Wayne Parham on Sun, 08 Apr 2007 14:53:16 GMT
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No, speakers are sound reproducers and should be as accurate as possible. They are to give the illusion that the instruments used are right there in the room with you, not add anything or take anything away. If you want to augment a certain track, instrument or music range, then you can use EQ to do it. But ideally, your speakers are capable of being sonically neutral.

Subject: Re: LC Peaking
Posted by Cuppa Joe on Sun, 08 Apr 2007 16:25:19 GMT
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If you play your guitar through a Celestion guitar speaker, sonically optimized for that instrument, it can sound great. However, if you record that guitar sound and play it back through the same

speaker, it will sound like ka-ka.

Subject: Re: LC Peaking
Posted by randle on Wed, 11 Apr 2007 15:18:37 GMT
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Now can you explain to me why that is?

Subject: Re: LC Peaking
Posted by Cuppa Joe on Thu, 12 Apr 2007 03:02:05 GMT
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It's related to Wayne's response above. A guitar speaker is made to PRODUCE a characteristic guitar sound. It will have colorations and range limitations which complement the instrument. If you mic the speaker and record your guitar sound, then play it back through some decent studio monitors, they will REPRODUCE your guitar sound accurately. If you playback the recording through your guitar speaker, it will again add its colorations and range limitations. You won't get your original guitar sound, and you're not likely to get something better, either. If you have the gear, this can be a fun experiment.

Subject: Re: Consequences of non-optimal throat transition in mid and high frequency horns
Posted by randle on Thu, 12 Apr 2007 23:12:07 GMT
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Can you elaborate on what you mean by an active crossover.
