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Subject: Request plans and Klipschorn question  
Posted by [sspeak](#) on Wed, 16 Feb 2011 06:03:18 GMT  
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Hi,

Can you please send me plans for the 7 pi?

Also, as an alternative I was thinking about using the midhorn and tweeter on top of a Klipschorn. The bass horn response is quite good except in the problem region 200-400 Hz roughly, a well-known issue. I see early posts (2004) on this forum about using your horns with the Klipschorn bass horn but not much followup. I did see one post on the Klipsch forum using your midhorn in a Klipsch Belle type of build, but little else. Anyways, can you tell me

1. has this been tried (successfully) with digital crossover and time alignment? What are the known or likely issues?

2. I built "false corners" since exact corner placement of the Klipschorn was not possible. But I am quite satisfied with the low bass response (below 200 Hz). Would your midhorn on top the Klipschorn bass horn lose much pattern control in this case, and how big an issue is it?

3. should the Klipschorn bass horn be rolled off something like 12db/octave at 200 Hz and the midhorn rolled off acoustically, which I think you do with the 7 pi?

Thanks for any thoughts you might have

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Subject: Re: Request plans and Klipschorn question  
Posted by [Wayne Parham](#) on Wed, 16 Feb 2011 14:17:19 GMT  
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The Klipschorn is too long internally for proper summing in the woofer-to-midrange crossover region. It cannot develop a coherent forward lobe because of the phase difference between woofer and midrange. It's great for acoustic loading but bad for summing and ultimately, the overall sound pattern suffers.

between it and the Klipschorn. Our approach is to use the corner as a large waveguide. It isn't used for horn loading in the traditional sense, it is primarily used for directivity control. Additionally, the woofer and midrange are blended to mitigate floor bounce. There is more information about constant directivity cornerhorns in the whitepaper below:  
High-Fidelity Uniform-Directivity Loudspeakers

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Subject: Re: Request plans and Klipschorn question  
Posted by [sspeak](#) on Wed, 16 Feb 2011 17:05:35 GMT

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Thanks for the plans and the information.

I appreciate the rather different philosophy involved in the constant directivity cornerhorn and the Klipschorn. But I am still interested in knowing whether digital compensation can be used to achieve constant directivity with the Klipschorn bass horn. Clearly constant and linear phase (delay) can be compensated. Are you saying that nonlinear phase (frequency dependent group delay) is the issue? I would think that could also be compensated provided it could be measured or calculated.

But I will say that even if your midhorn and tweeter is just used to achieve some constant directivity in the mids and highs along with increased smoothness in the 200-400 Hz region then that is a big step forward with the Klipschorn. Building large tractrix horns along with 2" compression drivers to reach lower cant in fact get low enough, is really expensive and has directivity problems

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Subject: Re: Request plans and Klipschorn question  
Posted by [Wayne Parham](#) on Wed, 16 Feb 2011 19:25:37 GMT  
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Well, that's true. You can delay the midhorn and tweeter to match the path length of the Klipschorn to get summing right, making a clean forward lobe that's where it's supposed to be. The midbass directivity would then be set by the walls, just the way you want it. Of course, lower bass is never determined by wall angle, that's a room mode thing, best mitigated with multiple bass sound sources. But the point is, with delay, I think you'd achieve parity.

One extra thing I'd probably do is to use a mild low-pass to reduce the bass bin output above 200Hz. You want some overlap to help reduce floor bounce, but you don't want energy through the basshorn at high enough frequency that it starts sounding throaty and ragged. There's a certain amount of acoustic low-pass from the folds, but it doesn't seem to attenuate the lower-midrange standing waves that line up inside. That's something I notice from Klipschorn bass bins that I think is somewhat easy to correct. Just low-pass them a little lower than the stock design requires. Then maybe you can have your cake and eat it too, good acoustic load and constant directivity.