Subject: Pi 7 frequency response
Posted by Tim Barnes on Wed, 18 Apr 2007 02:14:20 GMT
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Hi Wayne: I was browsing your measurements folder and was a little surprised by the way the slope of the Pi Seven declines as frequency increases, and by the rapid rolloff of the tweeter at about 15KHz. Can you explain the reasons? I'm just trying to understand the likely sound prior to making the commitment to build, and I have been under the impression that generally speaking one aims for a frequency response that is roughly flat to 20KHz, and that some people are even aiming for much higher frequencies with supertweeters.Thanks,tim

Subject: Re: Pi 7 frequency response
Posted by Wayne Parham on Wed, 18 Apr 2007 03:26:50 GMT
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That's just the nature of compression horns. They don't get much above 16kHz or so. Some people add super-tweeters, others don't feel the need. I personally would prefer a bit more on the top end, but not at the expense of integration. It's hard to seamlessly match a super-tweeter because wavelengths are so short at the crossover point.

Subject: Re: Pi 7 frequency response
Posted by Tim Barnes on Wed, 18 Apr 2007 03:35:08 GMT
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OK, I understand the top end piece. What about the more gradual slope from 500Hz to 15KHz? Is that an intended balance, or just something that's too small to notice in real life?Sorry about the neophyte questions. I'm old enough that my top end hearing is probably done for - not sure if that means I need more or less from the high end of the speaker...tim

Subject: Re: Pi 7 frequency response
Posted by Wayne Parham on Wed, 18 Apr 2007 04:30:00 GMT
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You're right, there's an overall trend, sloping downward about 5dB over the audio band. It's within a +/-6dB window up to the top octave, but there's a general slight sloping downward. I think it's a very natural sound.

Subject: Re: Pi 7 frequency response
Posted by Tim Barnes on Wed, 18 Apr 2007 13:16:24 GMT
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Thank you.tim

Subject: Re: Pi 7 frequency response
Posted by Matts on Wed, 18 Apr 2007 13:50:47 GMT
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After seeing all the 20K high frequency claims over the years, I was a little worried about this when I built my Stage 4's, but it hasn't been an issue at all. I thought I might add a supertweeter at some point, but have never felt the need. In fact, now when I listen to some of the speakers with them, it's a litttle annoying.

Subject: Re: Pi 7 frequency response
Posted by Tim Barnes on Thu, 19 Apr 2007 14:07:47 GMT
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That's good to hear. I find it difficult to judge a design without hearing it - I just don't have enough experience.Thanks for weighing in. Have you heard the corner horns? Any other inputs about the sound and qualities of your speakers?tim

Subject: Re: Pi 7 frequency response - HF
Posted by dB on Mon, 23 Apr 2007 14:31:48 GMT
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It all depends in the horn being used. For that fact, to have more high frequencies and if I was Tim, I would use SELENIUM D210Ti driver instead of Eminence PSD2002. Again, the listening window is so narrow at 16KHz that it's only 15º to the left and 15º to the right from the speaker (sweet-spot). Another way is to go with a speaker including the Vifa tweeter, flat to 20KHz and a real Hi-Fi home-runner with a large listening window both vertical and horizontal.
Cheers.

Subject: Re: Pi 7 frequency response - HF
Posted by Wayne Parham on Mon, 23 Apr 2007 15:44:20 GMT

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Dome tweeters actually have pretty narrow radiation patterns at high frequency. Intuitively, it looks like they would radiate an omnidirectional pattern but they exhibit collapsing DI according to

the same off-axis within a 90° x 40° angle as on-axis, even at HF above 10kHz. Response above 5kHz falls at vertical angles larger than that. I didn't measure other horns to see how they compare.

Subject: Re: Pi 7 frequency response - Splendid!
Posted by dB on Mon, 23 Apr 2007 16:24:45 GMT
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Hi, Splendid work Wayne. I keep watching as much as I can. I didn't know that about domes and I will keep that on record.Take care.BR

Subject: Re: Pi 7 frequency response - HF
Posted by Tim Barnes on Mon, 23 Apr 2007 17:14:18 GMT
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Hey, thanks for joining the discussion. I had a look at the Selenium part and it seems to have a broader frequency response than the 2002. My inclination is to build the system as Wayne has designed it, and then start on modifications if I either hear something I don't like, or (more likely) just can't help myself I was surprised to see how much tweeters beam at high frequencies - I'm not sure I really notice it with my current dome tweeter, so I'm guessing that as Wayne suggests, it's not a huge issue.It's interesting that in the latest incarnation of the Linkwitz Orion, he's added a rear-firing tweeter, and feels it makes a worthwhile difference.tim
Linkwitz Orion++

Subject: Re: Pi 7 frequency response - HF
Posted by Matts on Mon, 23 Apr 2007 17:19:33 GMT
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I think if you build it as Wayne suggests you'll be satisfied with the treble based on your listening experience; I have been with 2002 in Stage 4's. I have planned on upgrading comp driver, but somehow haven't got around to it for a few years.... However, there is a mischevious part of the brain that wants to accept marketing or conventional wisdom, or whatever as "reality," and every

once in a while that part wants to add some kind of supertweeter or whatever.... But when I listen to speakers that have them, I think it's too 'etched' or 'artificial' sounding and get over it. At any rate, it's fun too play with.

Subject: Re: Pi 7 frequency response - HF
Posted by Tim Barnes on Mon, 23 Apr 2007 17:36:41 GMT
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That's what I suspected. In any case, my hearing is probably well rolled off at 15KHz...I'm going to try some experiments with test tones, walking around my current speakers to see how obvious the beaming effects are.tim

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Subject: Re: Pi 7 frequency response - Splendid!
Posted by Wayne Parham on Mon, 23 Apr 2007 20:24:53 GMT
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Check the published response of Vifa tweeters. You'll notice they show response curves on-axis as well as two or three off-axis curves.

Subject: Re: Pi 7 frequency response - HF
Posted by Wayne Parham on Mon, 23 Apr 2007 20:27:02 GMT
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Try different tweeters too, and when using compression horns, try different flares. Many have different polar response.

Subject: Re: Pi 7 frequency response - HF
Posted by Tim Barnes on Fri, 27 Apr 2007 19:21:52 GMT
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Hmm. The main thing I discovered from listening to test tones on my Theil CS3.6s is that I can't hear anything above 15KHz at all. Perhaps I should de-wax my ears? My 11 year old can hear all the test tones up to 20KHz, although they were warble tones off the Stereophile Test CD 3, and perhaps he was hearing the warbles. I couldn't hear anything at all for the last few

samples.Perhaps this is also why I've never found CD players to be as objectionable as some do? Although I do find CDs less interesting and involving than LPs.tim