Subject: 1pi Measurements
Posted by rvsixer on Tue, 06 Dec 2022 15:23:15 GMT
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Sorry if I missed this info on the Pi Speakers website, or in searching this forum.

Are there any spinorama/polar/directivity measurements available for the 1pi? Horizontal and vertical? Thanks.

Subject: Re: 1pi Measurements
Posted by Wayne Parham on Tue, 06 Dec 2022 19:26:12 GMT
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Sorry, no. I don't show polars for the speakers without waveguides. The reverberant field is pretty uniform for a non-waveguide speaker, so the spectral balance is reasonably good. That makes 'em great for surrounds. But without a waveguide and having a first-order filter, they definitely don't have great polars. Off-axis - especially vertically - there are lots of places with nulls.

Subject: Re: 1pi Measurements
Posted by rvsixer on Tue, 06 Dec 2022 20:07:41 GMT
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Thanks Wayne.

All I really need are the approximate +/-3dB and +/-6db angles for hor & vert dispersion. Just want to make sure I can aim these as surrounds/atmos across my proposed home theater setup, to get adequate coverage for all the listening positions (and employ time-intensity trading to get the best volume match between seats as well).

Otherwise its time to build a turntable and get the measuring mic out :) ...

Subject: Re: 1pi Measurements
Posted by Wayne Parham on Tue, 06 Dec 2022 20:25:13 GMT
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You'll probably need to get the microphone out. Speakers like these have great on-axis response, and the overall average balance is pretty good too. But move the microphone off-axis even just a little bit and the response changes, especially in the vertical. So the published charts are a best location capture of on-axis response.

What you see when you measure a "traditional" speaker like this - one not made for uniform directivity - is it doesn't really make sense to talk about the "edge of the pattern," finding the place where response falls off 6dB. You won't find places at each side and above and below the speaker where response clearly starts to fall, like what you can expect from a speaker with uniform directivity.

Instead what you see is a lot of nulls, much like what you see as the reverberant field, which is characterized by dense interference from all the reflections in the room. Actually, I would not describe it as dense interference, more like "medium" interference. It is between the widely-spaced and clearly-defined nulls from a waveguide speaker and the tightly-packed and nearly indistinguishable nulls that form dense interference. It's just looks like the response curve varies a lot depending on the position of the microphone.

I considered taking a bunch of off-axis measurements, and then averaging and smoothing them to provide a view of the spectral balance of the reverberant field. In this averaged form, you could see a directivity trend, because all the sharp nulls would be smoothed out. But I elected not to do that because, even though I think it is useful data, it isn't any sort of standard. Only on-axis and polars really are. So I decided not to even mess with that.