Subject: Re: Tweeter Options for Line Arrays
Posted by selahaudio on Wed, 23 Sep 2009 00:10:34 GMT
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AudioFred wrote on Mon, 21 September 2009 19:52Rick, I noticed you've designed line arrays using Fountek ribbons, BG Neo 8's, and Dayton PT2's. Each seems to have its own set of advantages and disadvantages:

Zaph's distortion results have convinced many people that the Fountek NeoCd2 isn't a viable choice. However, reviewers almost universally rave about their sound, and they seem to be the only choice for a speaker whose woofer array will be more sensitive than 95dB. Also, they can be used with a 6.5" woofer array, which negates the need for a subwoofer.

The Neo 8's relatively low sensitivity, limited dispersion, and lack of upper octave output seem to be a great disadvantage, but they can be crossed very low, and every year when I hear them in line arrays at RMAF they sound very impressive.

The PT2 is the least expensive, and if it's really a Silver Flute YAG-20 with the Dayton brand on it, its distortion tests aren't good. However, when I heard them in a line array they sounded about as good as a comparably priced dome, and they are the only ribbon/planar tweeter choice for an array that can be built for under $1.5K.

So there's lots of confusion about these tweeters out there. Since you're the only person I know who has actually heard them in a line array application I was wondering how you would compare their sound in your designs.

Well unfortunately too many people accept Zaph's tests to be the gospel and never bother to investigate for themselves. Sadly John rarely will engage in a civil discussion with anyone that dares to disagree with him and for me that raises a red flag. I do think he has some good things to say but is very close-minded to other opinions.

Obviously many people like the Fountek ribbons so one may conclude one or more of the following:

A) Zaph's tests are flawed

B) Those of us who like the Fountek ribbons enjoy hearing distortion

C) Distortion isn't as important as things like frequency response,dispersion,etc

D) Measurements don't always agree with what we hear

E) Real listening tests with a crossover in place are the best way to judge a driver

A good example is the Dayton or Silver Flute planar tweeter. With the right crossover these can sound pretty good in an array. The main difference between the two is that the PT2C has a push-pull magnet (magnets in front and back of the element) while the Silver Flute only has magnets on the rear side. This gives the PT2C a little higher sensitivity and in theory should make

it more linear and lower in distortion. While I've not worked with the Silver Flute for several years I think the PT2C is certainly capable of acceptable performance in an array. The main drawback is that the sensitivity is lower than say a Fountek CD2.0 so your choices are more limited for woofers unless you use an active crossover that can lower the gain on the lowpass filter.

With the PT2C or YAG20 the crossover's transfer function is really important. Distortion in these drivers is affected a great deal by the fundamental resonance and the same is true for the Fountek, BG, Aurum Cantus, and other planar / ribbon drivers. With a typical dome the resonance is often suppressed with a rear chamber and / or ferrofluid both of which aren't practical or in some cases even possible with a ribbon or planar. What happens is that you have to rely on the crossover to suppress the resonance and if you don't design it properly the tweeters won't sound very good.

The next step up in price is the BG Neo8PDR. They also are lower in sensitivity and as you noted have limited dispersion in the top octave. The YAG20/PT2C planars are a little better in terms of dispersion but won't cross as low as the BG's. Having worked with the BG's I would say that they are often crossed lower than they should be based on my frequency response and harmonic distortion tests. The crossover point also moves up higher if you use them as a dipole, too high to make them practical for use with many woofers. I do find them to be more open sounding than the PT2C/YAG20 but not quite as extended so they benefit from toe-in.

Fountek has two tweeters for arrays, the CD2.0 and Pro5i. The Pro5i is high in sensitivity and will cross fairly low, but is quite expensive at $275 each. The CD2.0 won't cross as low but still has high sensitivity and has excellent horizontal dispersion due to the narrow element. The CD2.0 can match up with a wide range of drivers (3"-7") but I've found that the 3"-5" woofers give the best results.

Three other brands worth mentioning here. Raal has the excellent 140-15D which is pricey at $458 each but offers a higher level of performance. Aurum Cantus also has some larger ribbons, similar to the Founteks but more expensive and they fall short of the Raal tweeter's performance. Raven also has the new LS ribbon which is possibly the best ribbon available anywhere (and should be at $2,100 each!)