Subject: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by akhilesh on Sat, 22 May 2004 01:44:22 GMT
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Hi Everyone,The post on super expensive drivers makes me pose a basic question in our single driver forum: Should we try to get the maximum frequency coverage out of one driver (OPTION A), or should we define a critical range that needs to be covered by a single driver to keep the single driver magic (OPTION B)?Some initial thoughts on these options:OPTION A: Pros: Pure philosophy, no question of getting the single driver magic Cons: Such a driver is almost impossible to find. MUCHO dinero must be spent to even come close, and some may argue that trying to cover the ENTRE spectrum NECESSARILY leads to compromises in reproduction capability. The best drivers like AER may still not be as good, for example at 15,000 HZ plus as even average tweeters. OPTION B: Pros: Cheaper solution. If a sufficiently wide range is identified (say 50 HZ till 12,000 HZ) then purity compromise may be less. The best drivers that reporoduce a limited frequency range may be BETTEr than the best drivers that reproduce the COMPLETE range. For example, it may make sense to get a really widerange driver, and get tweeters and a biamped subwoofer for the really extreme frequencies. Cons: Lack of purity and philosophical compromise. I can tell you from my personal listening that option b TO ME really offers no compromise in sonic purity (at least to my ears) as along as a sifficiently wide range is selected. But then I am a cheap b____ with not too much money to burn on drivers. Thoughts by others are welcome! I know we have discussed this before, but this seems to be the fundamnetal philospohical question that we seem to come back to in our single driver world!-akhilesh

Subject: Re: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by Wayne Parham on Sat, 22 May 2004 11:01:00 GMT
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I suppose both ideas are pretty reasonable.To me, I had always dismissed the single driver idea as having too much lost on the bottom end and the top end of the response curve for my tastes. They also tended to be limited to relatively low listening levels, at least compared to what I'm comfortable with.But I say that in past tense, either because I've aged and mellowed or because there has been some improvements in the quality of single driver speakers in the last decade or so. All I know is that I really enjoy Phil's speakers with the Fostex 206e drivers, and later after hearing Jim's speakers having Fostex 206e's in a Martin King TL cabinet, I was equally impressed. Even a little more on the bottom end.Now I know that there are some single driver speakers that sound very nice, and I can certainly understand a guy getting a simple SET circuit and a single driver speaker with no extra frills in the signal path. It's pretty cool, and for a bedroom, dining room or intimate listening room, I think it's really nice. I get it, it's pretty magical.But there's a whole other world that opens up when even a two-way speaker is considered, and that brings me to your other suggestion. I really like having the range below about 2kHz covered by a single driver. Having a subwoofer cut in at 100Hz to 200Hz or so is also an option; Wavelengths are long so it isn't much trouble to integrate with the right combination of sub and mains. And some full-range or wide range systems go much further than my target of

2kHz, some of the full-rangers go out to 5kHz or 10kHz. That's a little far for some drivers, and it introduces its own sets of complications. But it has its sets of strengths too.The advantage of running up to 2kHz is that it gets you through the vocal fundamentals and into the overtone region. It sounds more natural to me to split there, which is why I tend to push crossovers up around there. 1kHz is sometimes advantageous for certain reasons, but that's getting down close to the main voice range. But the advantage of going low is that it tends to keep drivers from having so many cone flex modes. Some drivers are well behaved in breakup, but they all are less well behaved than they are when pistonic. So these are the advantages of bringing the crossover down below 5kHz and even below 2kHz.There's another one too. At 2kHz, the wavelength is a little over six inches. Of course, that means that 1kHz is over a foot. So you can usually get two adjacent subsystems close enough together to act as one, and with the right implementation, you can make the transition to be transparent. That's the name of the game, really. Whether using a single driver or multiple drivers, the idea is that we don't want a noticeable crossover. We want the transition to be as seamless as possible.But I don't think that's really what you're talking about here. I just wanted to throw that in, because I think it is related and relevant. Still, having a speaker that reaches only up to 2kHz is not full range or even particularly wide range. It's a midrange or a midwoofer. I think what you're talking about is a two-way system with a very high crossover point, something more like a super-tweeter augmented full range speaker. And I think there are some advantages to that approach too.Your Trusonics are a good example. I think you have a really excellent set of speakers there. Honestly, I thought the Trusonics needed something until you added the done tweeter to them. But now, after you implemented them as a two-way system, they are really wonderful.I understand you crossed the tweeters in at like 10kHz or 12kHz. That means the tweeters are coming on line pretty strong by 5kHz or 6kHz, but that is well above the vocal range and into what most would agree was pure treble. The only content coming out above 5-6kHz is cymbals and the rasp of strings, stuff like that. It's the sizzle and the air. So this kind of implementation makes the main driver cover almost the whole audio range. Sounds pretty darn good when done right.There must be something psychoacoustic about the top octave because it doesn't seem to be as noticeably disconnected as lower frequencies do, even when you know it's several cycles off. The wavelength in the top octave is about an inch and less, so there's no way to get the tweeter and the mains in phase. You can do it in some positions but not in others. But I've heard lots of super-tweeter implementations that sounded really nice.So I dunno. I guess that just proves to me there are lots of different ways to skin a cat. I think I generally prefer super-tweeter augmented full-rangers to pure single drivers. I like 'em with subs too. But I really do like the right single driver too, just a plain-ol' good driver in a box. As long as it does a pretty good job up to 12kHz or 15kHz and also goes down under 100Hz, it sounds mighty nice with a candle lit dinner and the right music.

Subject: Re: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by akhilesh on Sat, 22 May 2004 15:05:06 GMT
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Thanx for the post Wayne! (BTW the crossover in my home brewed swtup is at 14-15 KHZ. This sounded best to me with the trusonics). The rationale for my post was that this seems to be the FUNDAMENTAL question that every designer in this single driver world needs to resolve for

him/herself. There seem to be adherents on both sides. while the majority of hobbyist/small scale folk seem to think OPTION B is heretic, I know tannoy pretty much uses a supertweeter on all their setups. Also, i think one has to trust one's ears! The idea behind the post was just to get everyone to think about this question, approach it with an open mind, and then decide on what they liked best. thanx-akhilesh

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Subject: Re: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by hurdy_gurdyman on Sun, 23 May 2004 15:58:03 GMT
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I am a fan of option B. I've listened to both types of set ups and find I prefer having both a subwoofer and a high crossed over tweeter. My own vintage EV's are crossed at 60Hz and around 10kHz. Love the sound this way, getting very solid and extended bass and airy, well dispersed treble. Most of the music still comes from the one driver, and the sound is very cohesive and natural. Didn't spend a fortune, either. ;^)Dave

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Subject: Re: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by abajaj11 on Sun, 23 May 2004 19:59:45 GMT
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That's my approach too, except i am too lazy / cheap to get teh subwoofer (i can live with 50 HZ plus) and mine crossover at 14-15 KhZ. But I have never heard a good lowther horn....that might change my outlook...:-)-akhilesh

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Subject: Re: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by hurdy_gurdyman on Mon, 24 May 2004 12:53:11 GMT
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>>That's my approach too, except i am too lazy / cheap to get teh subwoofer (i can live with 50 HZ plus) and mine crossover at 14-15 KhZ. But I have never heard a good lowther horn....that might change my outlook...:-)

Subject: Re: One driver for FULL spectrum or one driver for critical portion of

spectrum?
Posted by Wayne Parham on Mon, 24 May 2004 13:57:56 GMT
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Subject: Re: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by abajaj11 on Wed, 26 May 2004 00:32:55 GMT
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:-) Dave & Wayne. Part of the fun for me, like you, is to spend as little as possible and still get good sound. ther eseems to be so much noise associated with lowther performance that i pretty much gave on pursuing those. But i'd still like to HEAR them someday ! with good equipment. -akhilesh

Subject: Re: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by Wayne Parham on Wed, 26 May 2004 10:43:13 GMT
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Do you know anyone that has Lowthers in Tulsa?

Subject: Re: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by akhilesh on Wed, 26 May 2004 16:59:00 GMT
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I don't. It would be cool to hear them! -akhilesh

Subject: Re: One driver for FULL spectrum or one driver for critical portion of spectrum?
Posted by Wayne Parham on Wed, 26 May 2004 17:19:31 GMT
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Let's talk Margiotta into getting a pair. He's a surgeon, so he's got the cash. Besides, I haven't seen him in a while so I gotta bug he and Dawne about something. Here I go to the E-mail to rattle his cage right now...

Subject: A word to the wise .....
Posted by Martin on Wed, 26 May 2004 18:23:16 GMT
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Wayne,If you buy a pair of Lowthers, make sure you test the T/S paramaters before using them. I love these drivers but .....Martin

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Subject: Re: A word to the wise .....
Posted by Wayne Parham on Wed, 26 May 2004 18:49:39 GMT
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M a r t i n!Glads to see you here! Don't stay a stranger so long. You've been sorely missed. When you're not here, we all just ask each other about you anyway. I understand you've measured electro-mechanical parameters for various Lowther drivers. Would you be willing to share the specs here?Or does Lowther allow such manufacturing variance that there is significant difference between units?

Subject: Re: A word to the wise .....
Posted by Martin on Wed, 26 May 2004 18:58:49 GMT
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Wayne,I received a pair of PM6A drivers yesterday and hope to measure the "out of the box" T/S parameters tonight. At that point I will have seven pairs of Lowther drivers in various states of break-in and I will post a summary of the T/S data.Hopefully, in the coming months I will post detailed T/S and SPL data for all of them like I did for the DX drivers already.Martin

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Subject: Re: A word to the wise .....
Posted by Wayne Parham on Wed, 26 May 2004 19:35:13 GMT
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Most helpful. Most helpful indeed.Do you use sealed box or added mass measurements? Constant current, constant excursion or constant voltage?Most folks use sealed box and constant excursion, i.e. test box and approximately 10 ohms known-value series resistance.

Subject: Re: A word to the wise .....
Posted by Martin on Wed, 26 May 2004 20:58:46 GMT
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I use LAUD 3.1 on an old 486 PC that is now located in my workshop. I use the added mass method using nickels (5 gm each) to get a mass that shifts the driver fs encoughto get a good measurement. I tried the closed box method and really did not like it because it required you to estimate the volume of the back of the driver and magnet inside the box or the front cone volume if the driver was pointed into the box. This change for every driver.I use a 10.1 ohm series resistor in my set-up and an old Teac receiver to supply the signal. This also allows me to play music for a while before making a measurement.

Subject: Re: A word to the wise .....
Posted by Wayne Parham on Wed, 26 May 2004 21:30:13 GMT
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Gotcha. Added-mass and constant excursion. That's probably what I'd prefer for the kinds of drivers you're testing too. I've done 'em both ways and I think I like added-mass for smaller, lightweight cones and sealed-box for larger, heavier, high-excursion cones. I really prefer it when I'm dealing with a manufacturer that uses Klipple and other systems like that to provide really good data for me to use. That's the best thing I can think of.

Subject: Contenders for Primary Driver?
Posted by GarMan on Thu, 27 May 2004 17:54:29 GMT
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Akhilesh, Dave,This Option B sound very appealing to me and is definately the route I'd like to explore for my next project (whenever that is).What do you consider to be good options for the primary driver in this setup? Fostex and Lowthers are obvious choices, but are there others?Gar.
