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.