Subject: Why won't a single driver speaker do metal?
Posted by Bob Brines on Tue, 26 Jul 2005 12:25:46 GMT
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There are two questions here: Why won't single-driver speaker full-range do complex music? Why won't single-driver speakers full-range to highly dynamic music? I really don't have an answer to the former question. I haven't heard or recognized this problem, but then I don't listen to electronic rock/heavy metal, so I wouldn't know. I suspect that it is tied to the latter question, but those who know more than I should feel free to jump in.I think I do have a handle on the latter question.Single-driver full-range speakers have a limited dynamic range. ( Limit this discussion to speakers that cover 40-20k Hz with a single driver. Let's not discuss front horns, etc where the main driver is basically a mid-range.) My Fostex FE167E speakers are limited to around 95dB maximum SPL and my Lowther speakers closer to 100dB. That's all you can get with reasonable distortion levels. These drivers are excursion limited, and in resonant cabinets, BR's, TL variants (like mine) and, BTW most highly convoluted back horns which act more like multiple TL's than true horns, they will start to run out of excursion around 80Hz. The sound will start to become muddy and congested. From a practical point of view, this simply means that there is a limit to how loud you can play your music.The problem with limited dynamics will be most obvious with material such as romantic symphonies. The dynamic range between a solo oboe and a full blown fff tutti is something like 30dB. If you are limited to 95dB, then that oboe needs to be no more than 65dB. Now 65dB is soft.Depending on your ambient noise level, air conditioning, etc., 65dB could be in the noise floor. Of course, 95dB is really loud, ear damaging if sustained for any length of time. IMO electronic rock has more sustained high dB material and therefore overloads the speakers. Rockers are also more inclined to crank it up. Of course, I'm not a rocker, so humor me. In any case observe the above warning.Amplifier headroom is also important here. If you are running a flea power amp an trying to get sustained 95dB out of a 92db speaker, you will be clipping the amp consistently. Without starting a flame war as to why anyone would prefer a flea-powered amp, if you want a clean 1 watt average output, you need 100 watts of headroom. Maybe I exaggerate somewhat, but you get the picture.IMO -- YMMV.Bob

Subject: Re: Why won't a single driver speaker do metal?
Posted by Martin on Tue, 26 Jul 2005 15:33:54 GMT
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Bob,Are there any speakers available that are 6 or 8 inch two ways, tuned to 40-50 Hz, that do a better job with dynamics then a similar sized full range design?  Is the problem inherent in the size of the driver or is it particular to full range drivers with low Xmax?  I am not sure it is fair to compare a two or three way design with a bigger woofer diameter with a 6 or 8 inch full range driver.  I really don't know the answer to this question, I don't get out very much to listen to other commercial speakers or to other DIY projects.Martin

Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Tue, 26 Jul 2005 17:14:55 GMT
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Great post Bob! Long time no see...hope all is well. My 2 cents:1. If you HAVE to use a single driver, then a back loaded horn may yield you the bass you need, with sufficient SPL. One of those mongo Lowther horns (like a hedlund horn) if properly done, may allow reasonable SPL levels. 2. The solution I use is a lot simpler: Use a sub for the lower frequencies. THis takes care of the SPL issue. Overall, Bob, you are right, a single driver non-horn, non-sub solution is great for simple music played at low volumes, but not really that good for high volume/complex music.
-akhilesh

Subject: Re: Why won't a single driver speaker do metal?
Posted by Martin on Tue, 26 Jul 2005 17:44:01 GMT
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Akhilesh,Is it the full range driver itself that cannot do the large scale music or is it the low watt amp running out of juice?Martin

Subject: Re: Why won't a single driver speaker do metal?
Posted by Wayne Parham on Tue, 26 Jul 2005 19:25:52 GMT
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I think the issue is related to displacement and bandwidth.  Displacement sets the bass limit and bandwidth sets the amount of intermodulation.  I think having a wide bandwidth driver has its advantages, and having more narrow bandwidth drivers has a different set of advantages.  The advantage of single drivers is simplicity and uniformity of collapsing directivity, no big shifts.  The advantage of multiple drivers is reduced bandwidth, allowing dedicated subsystem tuning and reduced IMD.Personally, I like a wide midrange band to cover the whole vocal range, better if covering the whole piano range.  In practice, I tend to choose a driver that covers as much of that as possible, but all my systems are multi-way, so they have to crossover somewhere.  Single driver systems don't have the crossover, but that means they have to choose between bass excursion and high frequency extension.  The cone has to move enough to make some bass, be rigid enough to limit breakup mode peaks in the midrange, but flexible enough to have some controlled modes for top end extension.

Subject: Re: Why won't a single driver speaker do metal?
Posted by Bob Brines on Tue, 26 Jul 2005 20:29:35 GMT

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A couple of points here.I do full range single driver speakers because they fill a niche. A reasonable sized speaker covers most of the musical range with an efficiency that allows low powered amps. It's a bonus that given the right kinds of music, they sound incredible. It's serendipitous that those who like low powered amps generally like the kind of music that works well on the speakers.I'm not pathologically apposed to multi-way speakers. Right now, I have the FB-16 BR's and an SP-10 sub hooked up to my HT receiver. The cross over happens digitally at around 100 Hz. This takes probably 1/2 the power off of the FE167E's and puts it on the Peerless 850148. IM is noticeably reduced. Dynamic range is noticeably increased. However, in my book, this is a 2-way speaker system. It won't work for the SET crowd because the cross over has to be done either digitally, which kind of takes the shine off of vinyl, or has to be done actively at the pre-amp level which normally means some OP amps.Another point, and I think Wayne really knows this, is that full-range drivers work BECAUSE of cone break-up. With a full range driver, cone break-up is controlled to allow the driver to get high enough to mechanically cross to the whizzer cone or dust cap.Bob

Subject: Re: Why won't a single driver speaker do metal?
Posted by roncla on Tue, 26 Jul 2005 21:01:44 GMT
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Either a BLH or an seperate bass driver is the answer.ron

Subject: Re: Why won't a single driver speaker do metal?
Posted by roncla on Tue, 26 Jul 2005 21:08:25 GMT
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Mini review by Jeremy who built my Dallas II BLH design.The horn is more balanced, than the TL, and the bass sounds pretty much in line with the highs. The mids are quite forward.The horn seems to go as low as the TL, or at least, low enough for me. With loud, heavy metal music-I chose this because I find most FR speakers can’t handle it at all-the horn could play very loud without losing composure. The TL was pretty mudded up at even moderate volumes.The horn is noticeably more efficient than the TL. It plays really, really loud with minimal power.The horn controls the low frequency excursion noticeably. Resting my hand lightly on the edge of the main cone while playing, I noted much less movement associated with the lows. Really cool. On acoustic music horn has a mid range detail that simply outclasses the TL. The TL sounds muddy in comparison. I would have never described the 206 as muddy before, but the difference was quite obvious.

Subject: Re: Why won't a single driver speaker do metal?
Posted by Ozzy on Tue, 26 Jul 2005 22:03:28 GMT
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>The solution I use is a lot simpler: Use a sub for the lower frequencies. THis takes care of the SPL issue

Subject: Re: Why won't a single driver speaker do metal?
Posted by Manualblock on Tue, 26 Jul 2005 23:58:52 GMT
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Say Bob; can you explain the cone breakup control issue, this is interesting to me. How is it controlled and does the damping factor of the amp play a part? Thanks.

Subject: Re: Why won't a single driver speaker do metal?
Posted by Wayne Parham on Wed, 27 Jul 2005 03:55:16 GMT
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It's all about the geometry and materials of the cone.

Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Wed, 27 Jul 2005 04:39:46 GMT
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Hi Oz,I run mine upto 80-100 Hz usually, and with an active crossover. THe "single driver kicks in around then. -akhilesh

Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Wed, 27 Jul 2005 04:46:30 GMT
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HI Martin,THe single driver I use will produce the bass with low watts, but with large Xmax. THis leads to distortion. This limits the ability of the single driver if producing the fullest frequency spectrum, to produce high SPLs.My solution: use the "single driver" in the 80/90 Hz plus mode.

This takes care of the SPL issue and at least in my experience, makes the sound a LOT cleaner. I have never heard a properly designed BLH in a single driver (well except my Klipschorns which are not single driver). Based on reading, it should produce significantly freater efficiency than a TL or a BR, and hence more bass and cleaner sound. Maybe the math model you are developing at present will show that. Do share with us the qualitative aspects of your models, as they develop and are validated. This will help us all gain insight into the advantages of a BLH, if any. -akhilesh

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Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Wed, 27 Jul 2005 04:53:49 GMT
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Bob Brines wrote:"It won't work for the SET crowd because the cross over has to be done either digitally, which kind of takes the shine off of vinyl, or has to be done actively at the pre-amp level which normally means some OP amps."Actually, I use the Xover in the preamp mode, and then use a SET (a 45 SET) to drive the "single driver". Sounds quite nice to me. I don't personally believe the opamps make a difference, (any more so than the myriad other phase shifts caused by passive compknents, which I donlt have, box, room reflections, etc). I have experimented with the same driver ( in the same box) in single driver mode, single driver with BSC circuit mode, "single driver" with super tweeter and BSC mode and finally, "single driver" with super tweeter, sub & active Xover mode. THe single driver with super tweeter, sub & active crossover sounds by far the cleanest and the most involving.  But this is just my opinion, and may be different for different setups. -akhilesh

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Subject: Re: Why won't a single driver speaker do metal?
Posted by zobsky on Thu, 28 Jul 2005 02:36:24 GMT
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>> 2. The solution I use is a lot simpler: Use a sub for the lower frequencies. THis takes care of the SPL issue. caveat, .. this works better if the "full range has a reasonably flat frequency response". many (though not all) full / wide range drivers out there have a rising frequency response which is not addressed by this method. Such animals are best tamed by employing a horn or such to counteract the imbalance, driver T/S parameters permitting.cheers

---

Subject: Re: Why won't a single driver speaker do metal?
Posted by Bob Brines on Thu, 28 Jul 2005 10:42:58 GMT
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Funny that you should mention T/S parameters at this point in the thread. If you are building a

resonant cabinet, BR or TL variant, you use a relatively high Qts driver and avoid the rising FR issue. The higher the Qts, the less likely you are to encounter this problem. The Fostex FE167E and F200A and the Lowther DX2 all have Qts 0.3 or better and don't have a rising FR problem. Lower Qts drivers generally do and the lower the Qts the bigger the problem.Bob

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Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Thu, 28 Jul 2005 13:14:54 GMT
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True, Zobsky. The sub of course won;t take care of the rising freq issue. For that, maybe a nothc filter can be employed. THE driver I am using does not have this as a serious problem. -akhilesh

---

Subject: Re: Why won't a single driver speaker do metal?
Posted by zobsky on Thu, 28 Jul 2005 17:18:16 GMT
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i agree, .. just wanted to highlight the fact that using a full range as a mid-high frequency driver isn't necessarily the best option for all full range drivers.

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Ed Schilling on Thu, 28 Jul 2005 17:47:45 GMT
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Bob, With My X150 playing Enter Sandman and my speakers in corners I can show you 105 dB peaks all day long. This is 8 feet from the speakers not at "1 meter". I have demonstrated this to many people. With My F1 the peaks are limited to 100dB or so. And with my Audio Note 300B about 98 or so. The sound is not compressed and you can understand the lyrics easily....including the kid whispering. I have never had a single driver TL that was able to do that. I decided to see just what the 108 could do and put on the Stereophile Test CD 2. I played the drum solo. The meter recorded 115 dB peaks 8 feet from the speaker. Not a hint of distortion. Drums in the room. The right driver went south about 10 seconds from the end. The look on my guest's face was "priceless" The "Girl" kept saying...."but they are so tiny, how can they do that? Now I am NOT trying to start an argument here but I think that (even rear) horn loading increases efficiency and reduces excursion....well I think that's what Paul Klipsch used to claim. In my case the corners are used to "make the rest of the mouth of the horn". Modeling the enclosure will not give an accurate picture. But even so I'll tell you the flare is "roughly" exponential and the path is ~ 6 feet long. I have built TL's for the 108 and I can assure you the excursion is NOTICEABLY more than the same driver in my "favorite" speaker. You can see it easily when both are driven to the same SPL

with the same warble tones. The TL's ( I built for comparison) can't come close in clean output if both use the same driver. I will not argue that a case can not be made for the statement..."BTW most highly convoluted back horns which act more like multiple TL's than true horns, they will start to run out of excursion around 80Hz.", this may be able to be "proven on paper"...I used to assume it was true, but my observations and experiments showed this not to be the case, at least in my example of a back horn. Now, when they (my speakers) are not in corners they certainly have a higher cutoff....but the efficiency gain from a couple hundred Hz on down seems to still be there as the excursion is still noticeably less than the TL for a give SPL and freq. The TL's will go a little lower in this situation, but again, at the cost of MUCH lower maximum SPL's. They don't go lower if the Horns are in corners and are now much worse off in terms of maximum SPL. I gave up on TL single driver speakers a long time ago (years)for these and many more reasons. That said I love TL's! Just built a new one but it ain't a single driver! It uses a 6.5 in co axial with a (gasp!) crossover. It needs power and will do pretty decent SPL if it has it. Now, as we all know speaker design is an art and science and full of compromises....but the premise a single driver can't do "Metal, Rock or high SPL" is simply not true. I know of at least one that can and it uses a 4 inch driver. I promise that no one that has been in my 17 X 18 "Pink Room" will tell you single drivers can't play Metal, Rock or any music that requires high SPL without "compression" or "distortion". Assuming high SPL is in the 100-105 dB range. And anyone is welcome to come by most any time and hear for themselves.EdMy opinions, OK guys...don't beat me up too bad!

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Wayne Parham on Thu, 28 Jul 2005 18:32:53 GMT
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Be sure and come to GPAF next year. I think it's fair to say we'd all love to hear those speakers of yours, and you'd meet some real friendly folks. The atmosphere is that of a group of intelligent enthusiasts coming together, not overtly commercial like some trade shows. Most of us pay little attention to magazine reviews or emotional arguments, we're more impressed with the bottom line. So I hope you can come next year and we all can see and hear your speakers.

---

Subject: Re: Why won't a single driver speaker do metal?
Posted by Ed Schilling on Thu, 28 Jul 2005 20:21:05 GMT
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Thank you Wayne, I'd sure like to. We'll see. But in the mean time, my offer stands, any one may visit pretty much anytime for a listen. Ed

---

Subject: Re: Why won't a single driver speaker do metal?

Posted by Regal on Thu, 28 Jul 2005 22:46:13 GMT
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Ihave a pair of fostex 127's in the BR enclosure. The bass and midbass suck. But to me metal is all about the electric guitar and these single driver speakers reproduce the guitar better than anything I have ever heard.

Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Fri, 29 Jul 2005 03:58:27 GMT
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As a Tulsa resident myself, I would like to reiterate Wayne's invtation, Ed. You will have a lot of fun! BTW, which town ar eyou based in?-akhilesh

Subject: Re: Why won't a single driver speaker do metal?
Posted by Kim Schultz on Fri, 29 Jul 2005 05:40:25 GMT
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Ed, What speakers are you using ?

Subject: Re: Why won't a single driver speaker do metal?
Posted by JLM on Fri, 29 Jul 2005 08:38:17 GMT
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Ed is referring to the speakers he sells:http://www.thehornshoppe.com/

Subject: Re: Why won't a single driver speaker do metal?
Posted by JLM on Fri, 29 Jul 2005 09:42:31 GMT
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Bob,I associate metal with uniformly loud (translate very limited dynamic range) and usually highly distorted "music", none of which is left untouched by various electronics. So I don't connect your thread title with the two questions you pose. IMO the only realistic yardstick to evaluate audio

equipment is live, unamplified music.  As concert like playback of metal would seem to be the gold standard and arena/stadiums with PA speakers playing at painful spls offer horrible sound, I'm at a loss to explain why anyone would think there is a meaningful relationship between audiophile speakers and metal.Without multiple drivers single driver speakers have a coherency and direct amp connection that provide can greater resolution.  Moving from simple to complex musical forms may just be revealing how limited the human brain is to processing all the information being received.  I've notice this phenom during live symphonic, orchestral, and choral performances.  I just can't separate 30 violins or 100 vocalists.  Perhaps the performance level of single drivers reveal this human limitation.The ultimate sound pressure level (spl) concern is simply due to the limit of materials available and the laws of physics.  You just can't have a tiny driver with a huge volumetric displacement which would be ideal.  And ideally any driver would have zero cone mass, perfectly rigid cones, extremely high magnetic field strength, and extreme efficiency.  All that said, I believe that the single driver concept can be the right one for most residental applications.I agree with you that playback spls should average no more than 85 dBs and that lots of amplifier headroom should be available to insure playback of the full dynamic range on the recording.  Your example of 20 dB of headroom is not out of line IMO.  Like Ed mentions below don't know if you've tried a good, big, high Q amp with your speakers, but many of these limitations go away (try a NuForce amp).  I fully believe in the importance of good drivers/speakers in the playback chain but I heard $4000 worth of pre/power amps make $5 speakers sound incredibly "decent" (not good, but completely transformed).  Imagine what the proper amp could do.If your background noise level is 65 dB you need badly to get a better listening environment.  A quick check of spls around the house with my cheapy Radio Shack meter found that I had to be within a foot of the TV to reach 60 dB while my wife was watching 12 feet away and I can hear all the dialogue 30 feet and two 90 degree turns away in the next room.  The last time I was at a symphony spls never reached 80 dB from the 4th row.  IMO realistic goals for playback are 80 dB average and 105 dB peaks with a background around 20 dB.  Continued exposure to more than 85 dB will result in permanent hearing loss and could also produce a lifetime of permanent pain.

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Subject: Re: Why won't a single driver speaker do metal?
Posted by FredT on Fri, 29 Jul 2005 10:43:58 GMT
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If you do come to the GPAF bring a couple of pairs of model 2 grills. Wayne's Pi speakers are kinda plain looking, and we could divide the grills and stretch them (quite a bit) so one grill would cover both drivers in the 2 Pi Tower speakers.http://www.thehornshoppe.com/optionalgrills.html

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Subject: You obviously haven't heard a pair of Carolina Audio speakers.
Posted by GTF on Sat, 30 Jul 2005 12:22:22 GMT
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Pink Floyd, ELP, Zepplin, Moody Blues, Kalma, neversounded better. No,,, not ballpark volume level's, but LOUD enough.And articulate deep bass from a pair of transmission lineJordan subs. Stunning.Too bad Jordan stopped making the 7" driver.GTF

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Subject: Re: Why won't a single driver speaker do metal?
Posted by bacobits on Sat, 30 Jul 2005 12:59:46 GMT
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Well, I have the 1600II's and they can kick some ass more so than the Fe108e. No complaints here. BUT, I do use a HSU VTF3/2.DN

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Subject: Re: Why won't a single driver speaker do metal?
Posted by roncla on Sat, 30 Jul 2005 16:02:39 GMT
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2. The solution I use is a lot simpler: Use a sub for the lower frequencies. THis takes care of the SPL issue. So very true! If the FR is in a sealed (very small volume) and allowed to run FR with the sub being rolled off at 200-300 hz (i perfer sealed again for the woofer) and both are bi amped then you have a very effective system thats a simple build.  Although i am a horn nut , this method is very simple ( to me anyway) as i use gainclones and can wip one up in around one hr.( case not included). Or just put a cap on the front end of one of those little Sonic T amps for the roll off of the woofer and use another for the FR. There ya have it a cheap/simple effective system that probably would cost < 500$ with a quality FR driver and woofer.ron

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Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Sun, 31 Jul 2005 12:30:54 GMT
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Yes, one could do a sealed box. I do a BR buil (mor ecomplicated) but it allows frequencies down to 80-90 Hz on the Full range driver without visible X. I gues sealed boxes would have 12 db rolloffs and probably blend nicely. 150-200 Hz on a 12 db rolloff should be OK for imaging, rhough I have never tried it. -akhilesh

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Martin on Sun, 31 Jul 2005 19:56:50 GMT

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Ed,On the Decware forum you wrote :"I read Dave's post.....I then went to ART and read Bob's post and replied to it. In a fairly "nice" manner. I simply disagreed with his premise and reasons and offered my thoughts and opinions. And that would have been it for me.....and BTW....my opinion seems to be holding there...no one there has slammed me at all yet, and a few even agree."Shortly after posting your response on this forum, you provided a pointer from your own forum on AudioCircle. Then you enter into a discussion on the Decware forum where you argue your point of view in a number of posts. I can only conclude that you made the post here to stir the pot and also provide amusement for your followers on the other forums. In one post on the Decware forum you make the statement above. You seem to be under the impression that since no decenting opinions have been offered, that people must agree with your initial post. While I agree with one or two of you minor points, I disagree with most of what you have stated as facts. Most of what you have stated is technically not correct. I decided not to respond for two reasons. First, I find the tone of your posts unacceptable in particular where you state opinions as facts, most of which are incorrect. Second, I know that if I do respond you will immediately turn it into a cat fight like the one you have going on the Decware forum with Jeff. There is no question that you are a unique character and some of your best supporters also seem to enjoy your over the top way of communicating on the forums. Based on what I have read your back loaded horn design is well recieved. Personally, I just don't want to be bothered entering into a posting exchange with you similar to the one on the Decware forum. So for the record, I disagree with most of your statements and am just not willing to enter into a AA style of post exchanges. That is the reason I remained silent, not because I agreed with you.Martin
Quarter Wavelength Loudspeaker Design

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Subject: Cone resonances.
Posted by Mike.e on Mon, 01 Aug 2005 04:20:34 GMT
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Covered in 'high performance loudspeakers' edited by martin colloms. My local library has 3 good acoustics books including this one.D factor affects the low end.Mike.e

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Ed Schilling on Tue, 02 Aug 2005 00:58:52 GMT
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Martin, Fair enough. You should know I was not thinking of you or anyone in particular. I am sure you don't agree with me and would not expect you to argue with me on Waynes forum. I do try to point out as often as possible that many times I am not stating "facts" but rather opinion and observations. If I have gotten facts wrong I think you should educate me.Please read the last sentence in my reply to Bob's post. I clearly say " My opinions Ok, Guys". My response to Jeff

was based on his first post to the Decware thread..(page2).he said something in it that I could simply prove not to be true. I have re read the post I made on this forum and I can back up my opinions.....My only intention was to disagree with Bob's premise....single drivers can in fact do "Metal". That's all. Nothing more. No hidden agenda. The fact that you did not reply did not infer that you or anyone else who did not post agreed with me. Again, I stated a fact based on an observation....and I was thinking of no one in particular....not even you.You wrote.....>>>>>> Shortly after posting your response on this forum, you provided a pointer from your own forum on AudioCircle. Then you enter into a discussion on the Decware forum where you argue your point of view in a number of posts. I can only conclude that you made the post here to stir the pot and also provide amusement for your followers on the other forums. My opinions on the subject are just that. I'm not trying to cause trouble but thought I might give my .02. I simply disagree with the subject line. And a few other points as well, but not on everything. Bet you can guess which ones if you try! A hint....my PSTL is much happier with my X150! Thought some of you might be interested..... Ed

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Subject: hornets nest
Posted by hurdy_gurdyman on Tue, 02 Aug 2005 14:49:02 GMT
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Hey guys, my link on the Decware Forum seems to have stirred up a hornets nest. That wasn't my intentions. Many folks over there are interested in single driver speakers so I posted a link so they could share the interesting posts. I took no sides on this issue and was most interested just to hear what folks had to say. Sorry if it caused a bit to much upset.Dave

---

Subject: Re: hornets nest
Posted by Manualblock on Tue, 02 Aug 2005 17:15:06 GMT
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Wait a minute; this is what the forum exists for; why apologise. Thats baffling.Whatever role you had in this then Kudo's to you; it's a great thread.

---

Subject: Re: hornets nest
Posted by hurdy_gurdyman on Tue, 02 Aug 2005 19:29:21 GMT
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I guess it did get more responses than most have recently.Dave

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Subject: Re: hornets nest
Posted by Wayne Parham on Tue, 02 Aug 2005 20:43:53 GMT
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I agree with John, that what others do isn't your fault.I think the interchange of ideas is great.But I will say that I think the high school BS is, well, high school BS.  Seems to me that if a person has a reason for chosing a particular mechanism, an idea that they think is worth using, they could articulate it.  If it can't be described, it probably isn't worth doing.  So to rely on an emotional argument for me is hollow words.When kids brag about how fast their cars are, it's usually because they're scared to go to the race track and get a time slip, lest their fantasy be smashed.

Subject: Re: hornets nest
Posted by Manualblock on Tue, 02 Aug 2005 23:06:36 GMT
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Well; I'm baffled all over again.

Subject: Re: Why won't a single driver speaker do metal?
Posted by Martin on Tue, 02 Aug 2005 23:22:13 GMT
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Ed,I read the two private e-mails and the posts above and on the Decware forum.  I'll answer with a few thoughts but there is too much stuff in all of these to address each topic without spending a ton of time and ending up in a huge debate.  I don't have that much time or care that much about the topic, I am not upset or mad at anybody and really don't take this whole debate that seriously. Life is too short.1. You seem to have a strong reaction to Jeff's post at Decware and have interpreted this as a "back handed slam" and a few other descriptive phrases.  I reread his post and don't see anything that should have caused this reaction.  He doubts your findings and I can understand why, I'll elaborate below.  From my experience on the Internet and in life, whenever you lay out a theory or very strong opinion you have to expect people to respond.  You are inviting comments and some people are not going to agree.  You have to deal with that.  Many people have built my speaker designs and/or used my software and for the most part have been very happy with the results.  Some have not like my designs or software results and have expressed their negative opinions on open forums.  They are entitled to their opinions and to express them.  I don't jump on them or respond unless a specific concern is identified that I can help clean up.  A guy on TNT audio built my Lowther ML TL design but with a few of his own "changes" and then reviewed the result as being my design. In my opinion he compromised my design.  I never responded and he never gave me the opportunity to comment before posting the project.  Oh well, such is life.  Somebody expressed some doubt about your claims and you went off the deep end, claiming to be a victim of a lie and insulting back handed slam.  That person had the good judgement to just walk away while you ranted on, in my opinion you did not look good and came

across as very immature.  You detemine how people will view you, if you want to be though of as the "redneck jackle" that is fine.  If you want to be thought of as a speaker professional and taken seriously you need to think about how you want to come across when somebody voices a negative opinion about you or your product.2. In one of your posts you present the following observations."With My X150 playing Enter Sandman and my speakers in corners I can show you 105 dB peaks all day long. This is 8 feet from the speakers not at "1 meter". I have demonstrated this to many people. With My F1 the peaks are limited to 100dB or so. And with my Audio Note 300B about 98 or so. The sound is not compressed and you can understand the lyrics easily....including the kid whispering."Lets think about these statements.  Your speaker can produce between 98 to 105 dB at 8 feet in your room depending on the amp used.  OK, I'll buy into these claims.  The question I would ask is at what frequency?  Putting out 105 dB at 1 kHz is very different then claiming 105 dB at 30 Hz.  Without a measurement, it is not clear what the frequency response of your speaker really is in your room.  I would agree that corner loading them in your room helps the bass but I have my doubts that you are producing 105 dB flat down to deep bass.  The speakers play loud but I ma not sure I believe that a small driver is capable of that level in the frequency range 30 - 100 Hz without severe distortion, compression, of self destruction. This seems to also be the result obtained by the TNT review linked from your site, I think he noted that above 100 dB the mids did not increase in volume but the bass continued to rise, this is impressive but does not sound like a real desirable linear result to me. A couple of shorties :3. Two claims were made about the low frequency roll off on the Decware forum, 20 dB/octave and 30 dB/octave.  A back loaded horn rolls off at 24 dB/octave.4. You wrote "Modeling the enclosure will not give an accurate picture.". Obviously I cannot agree with that statement.  A computer model can go a long way to helping understand the way a speaker works and how to improve the design, but it has to include all of the important contributions.  Garbage in generates garbage out. I believe that my latest MathCad back loaded horn simulations are getting closer and closer to providing a reliable design tool which includes reinforcement from room boundarys.5. Based on my recent back loaded horn modeling, I believe that your speakers are acting like a TL at the lowest frequencies and transition into horn like behavior probably above 100 Hz.  Nothing wrong with that design method and it is the one I am exploring for my own back loaded horn speakers. Having the strong undamped TL resonance helps the bass output.  Corner loading helps the bass output.  But the only way I am going to believe 105 dB at 8 feet with extended low bass output without any severe distortion or compression is through scientific measurements.  Opinions and postulating are not going to convince me, but that is just me.  Maybe I am just a cynic.Martin

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Subject: Thank you Martin.....page 1
Posted by Ed Schilling on Tue, 02 Aug 2005 23:51:18 GMT
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Martin,This was much nicer! I will address each point you make in detail in "page 2" because your questions deserve "real answers". Thank you for the opportunity to explain the things you have a problem with. Give me a couple hours. Thanks for acknowledging my e-mails.....you needed to know the time line in order to know I had no intent to "stir the pot" as you thought. EdBTW....read MY post again concerning roll off, I said "more like 20 db/octave"...in response to Jeffs reading of the graph.....he said 12. And I was not trying to claim the theoretical number...more like what I have seen....The 30 figure was a mistake....did I post that?

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Subject: .page 2
Posted by Ed Schilling on Wed, 03 Aug 2005 01:10:52 GMT
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Martin,1. The only thing you need to know is "The Redneck Jackal" name was a result of me being nice to an ass.....long story. It's an inside joke. For some old posters at Decware. I could give a Rat's Ass if people don't get it. It was all in fun and if people hold it against me, well, so be it. Why would you bring that up? What does it have to do with my post here? About Jeff....well..... he is too smart to not know how his posts come across. I think he is "very good". You should not have made me point this out.2. Well, like I said Enter Sandman.....I don't know the FR response of the song.....it just sounds real. They are 50Hz corner horns. Read the posts at Decware....people have heard the levels I claim. As to measured response? There is a graph posted at Decware. I don't think Richard (TNT) had an X150....or any comparable amp..... What you can do is read through the posts at Decware again and read what people who have actually heard what I claim have to say. Will you not take their word for the levels I claim and that the sound was "balanced" and that I did not have a sub hooked up. What more do you need? I stated a figure, people have heard it, and they will say so, but if you don't believe either them or me? So be it. I stand by my reply to Bob's post....( some) single drivers can do Metal!3 as noted in page 1....I said to Jeffs' post...."more like 20 db/octave below cutoff" Now really, Martin....just because I didn't say "exactly" 24 but simply spoke in "plain English" you are going to point it out.....gee, sorry. But how do you know that my BLH doesn't roll off at that rate....because of your calculations? Have you measured the rolloff of mine? No? well then you should not assume you know more than me. I think some one else said 30....might be my fault but for the record I did not say that anywhere, I do not think.4 Now that, you will have to convince me on.....but I will not call you names or point out where I think you are in error....you might be right but I think there is about a snowballs' chance in Hell a sim is going to tell you how a given design that is not even real will actually sound in a room....call me a cynic.5 That is simply completely wrong, The gains are all below 200....sorry that your guess is wrong....There is very little gain from the horn above 200. It is ALL below 200. I simply do not need your confirmation of what I hear every day and have measured. I don't need to prove it to you or anyone.....it is not hard to hear. Again, the SPLs I claim have been seen, measured, and heard by many people. I never said 105 @30 hz.....I said they can play Metallica (metal) at those levels all day long, 8 ft from the speakers.....and sound balanced and not "thin" or distorted. And my question to you is....why did you reply to my post in the first place? You did not dispute anything I said in the post per se....you just attacked and accused me of stuff I didn't do including getting technical "facts" wrong. I was much "nicer" in my reply to Bob's post than you were to mine. Why is that? Because you thought I had an "agenda", trying to "stir the pot". Well, nope.....I was simply giving my opinion as I said at the end of the post. But no big deal.....One thing though, you said something about coming across as a "professional", well see, that, I'm not too worried about.....most everyone already knows how I am.....A regular guy. Ed

Subject: Re: hornets nest
Posted by Wayne Parham on Wed, 03 Aug 2005 01:41:05 GMT
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I'm just making the point that I'd rather have a discussion about what things work and why than a series of exchanges like "mine is better than yours." To use the car analogy again, if we talk about cam profiles, intake and exhaust types and sizes, etc, we can probably be more useful than to just say my car will kick your car's butt.

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Subject: Re: hornets nest
Posted by hurdy_gurdyman on Wed, 03 Aug 2005 01:58:18 GMT
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Well, I'll brag right now that MY Ford Escort is slower than your car. Especially with it's 100% factory cam and everything!Dave

---

Subject: Re: hornets nest
Posted by Wayne Parham on Wed, 03 Aug 2005 06:29:50 GMT
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Maybe this is yours?

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Subject: Re: hornets nest
Posted by hurdy_gurdyman on Wed, 03 Aug 2005 12:33:41 GMT
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I'd trade cars any day. Mine is an old white 94 Escort wagon. It's starting to show a little rust around the edges, but still runs great. With the stock engine, it could only compete with go-carts and such (barely.)Dave

---

Subject: my tone....
Posted by Ed Schilling on Wed, 03 Aug 2005 12:43:28 GMT
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Please do not mistake my writing style for having a nasty tone to it. The way I ask questions and reply sometimes is taken "the wrong way". I even see how that could be so when I go back later and read my own stuff! There was no "tone" intended in Page 1 and 2....please don't think I

intended anything other than to try to answer the questions as I see it. For the record Martin, I can see how you'd be skeptical of my claims.....but that's OK too!Ed

---

Subject: Re: hornets nest
Posted by Manualblock on Wed, 03 Aug 2005 13:16:04 GMT
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I drive a 1993 Buick Roadmaster Station wagon with the fake wood sides. I think that allows me into the dumbest car competition; no?My son and his freinds all hide when they see me coming. All the rubber side bumpers are dangling also.

---

Subject: Re: hornets nest
Posted by hurdy_gurdyman on Wed, 03 Aug 2005 14:08:06 GMT
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Me, I don't care what my car looks like as long as it runs reliably and always gets me there. Now my motorcycle, on the other hand, has to look nice. Dave

---

Subject: Re: Why won't a single driver speaker do metal?
Posted by Retsel on Wed, 03 Aug 2005 18:58:00 GMT
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I have Lowther DX4s and I use them in Hedlund Horns and also on open baffles. In both cases I high pass (70 - 100 hz) the Lowthers and use a sub/woofers underneath. Keeping the low frequency material out of the Lowthers keeps the midrange free of doppler distortion enabling them to play at high sound levels very cleanly. The dynamics are stunning. Therefore, they can play "metal" quite successfully. Clearly I am using my Lowther drivers as wide range drivers instead of full range drivers. But this is best anyways.There are people who get bass down to the 30s with the Lowthers in certain backhorns, such as the Big Fun Horn. I have not heard these speakers though. I still think that highpassing the Lowthers is best. Retsel

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Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Thu, 04 Aug 2005 16:24:28 GMT
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I haven't heard the hedlunds, but i'd agree with you. I'd do the same if I had the speakers. How are the highs on the lowthers, BTW?thanks-akhilesh

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Subject: SOme comments on this thread
Posted by akhilesh on Thu, 04 Aug 2005 16:35:46 GMT
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It's a good thread, guys. I believe all of us learn when two knowledgeable people like Martin & Ed exhange their opinions and views and argue on a public forum. Clearly they have different views on some things (though I am not sure their views are ALL that different). Ed approaches design from a bottom up fashion (build, test, build, test), while MArtin is top-down (design, test, design, test). At least that's my opinion. Both guys are very experienced and knowledgeable, and I think agree on the basics of driver behavior. While there was borderline hostility, I am glad we are over that. The knowledge you both have is MUCH too valuable to distort with name calling, or as Wayne says: my speaker sounds better than your speaker. It would be great if both of you could ship your speakers here (and yourselves as well of course, if possible!) at the next GPAF, so we can have a nice listen and post reviews on the speakers that are a product of your methodologies. That would be fun and would probably benefit you both as well in the evolution of your speakers. Tulsa is centrally located. Shippiing speakers is not that expensive.I'm sure we can find a comparo room for you guys at the next GPAF, if all you do is ship the speakers.  What say you?-akhilesh

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Retsel on Thu, 04 Aug 2005 17:09:51 GMT
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The highs from the DX4s are very good.  I would still prefer a great ribbon tweeter though (i.e., like that from Maggies). For the open baffle system I am basing my system off of the Basszilla design by Dick Olsher which has a small ribbon supertweeter (Aurum Cantus) to augment the highs from the DX4s.  It provides some air (reproduces frequencies above 10 k hz) but is not a requirement for great sound (in my opinion).Retsel

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Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Thu, 04 Aug 2005 20:47:45 GMT
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I felt the same way when I heard Bob BRines lt2000 (great sounding speakers if used as wide

rangers BTW). I thought they benefited from a super tweeter crossed up real high. -akhilesh

Subject: Re: SOme comments on this thread
Posted by Manualblock on Thu, 04 Aug 2005 21:20:18 GMT
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AK; you're such a reasonable guy. Are there any houses for sale in your neighborhood?

Subject: Re: SOme comments on this thread
Posted by Martin on Thu, 04 Aug 2005 22:58:52 GMT
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Akhilesh,Very good summary. But I will add one slight modification/expansion, you wrote :"Martin is top-down (design, test, design, test)."My actual process is as follows :1. Break in and test driver T/S parameters.2. Design system using MathCad worksheets.3. Build system.4. Test acoustic and electrical response of system.5. Design and install compensation circuit based on measurements.6. Drag "finished" system out of basement and up to second floor listening room.7. Final minor tweaks by ear.Since I wrote the MathCad worksheets, I have never scrapped a box and started over. The building part is my biggest challenge. The basic box response is mathematically predictable. My goal is to merge step 5 into step 2.Martin

Subject: Re: Why won't a single driver speaker do metal?
Posted by Martin on Thu, 04 Aug 2005 23:08:17 GMT
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One thing I have never understood. Hedlund horns are a truely amazing project. I would never even consider building a pair, they are well beyond my own limited cabinet making skills. Back loaded horns in general are a very complex build compared to even TL's. But if one were using a sub from say 100 Hz down, why would one build a Hedlund horn to be used only in the mid bass and up? Why wouldn't an open baffle or small sealed enclosure be preferable? From my perspective, the advantage of building a back loaded horn is the potential for very efficient bass output making a sub not necessary. What advantage does a Hedlund horn, or some other back loaded horn, combined with a sub produce that makes the combination better then the simple open baffle or small closed box solutions?Martin

Subject: Re: Why won't a single driver speaker do metal?
Posted by hurdy_gurdyman on Fri, 05 Aug 2005 02:33:29 GMT
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It's funny, but a lot of fullrange single dirvers benefit from a super tweeter (especially drivers from 8 inches and up.)It really is hard to have one driver truly "do it all".Dave

Subject: a good question
Posted by Ed Schilling on Fri, 05 Aug 2005 05:14:11 GMT
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Martin, That is a good question.....why WOULD someone go to all that trouble when a simple OB or sealed enclosure would be so much easier to build? There MUST be a reason! And I doubt it's marketing on the part of the builders.....my guess and it's only a guess..... Efficiency, dynamics.....and to achieve a balanced response down to cut off with out sacrificing efficiency might be a couple reasons. Again.....just my whacked opinion to a good question. I have been asked that same question many times, and I like to ask it of people....after all why go to so much trouble? Well, after hearing the alternatives, all of them.....in the case of SINGLE DRIVERS...the BLH wins every time (IN MY OPINION), they simply sound better than a sealed when using a SINGLE DRIVER with a low

Subject: Re: a good question
Posted by roncla on Fri, 05 Aug 2005 10:25:28 GMT
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You hit the nail on the head Ed ole buddy.ron

Subject: Re: a good question
Posted by Martin on Fri, 05 Aug 2005 10:26:54 GMT
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Ed,I think we are talking about two different approaches. Let me add some more to the discussion.Lets say one is starting from scratchand the new full range drivers just arrived on the doorstep, the question is what to build.Path 1 might be a back loaded horn. So the back loaded horn is built and the hope is that the bass will be outstanding and no subwoofer is required. The full range driver is all that is used and the entire audio spectrum is covered. Great intent but this is not what I see often when reading the audio forums. The builder puts together the back loaded horn and then starts looking for a sub because the very bottom end is disappointing. I have seen

this many times.Path 2 would be to design a system including a sub right from the start. The full range driver is only required to play from say 200 Hz up. No bass from the full range driver. Why build a back loaded horn? If you build a OB then a crossover is needed for the sub and for the full range driver on the open baffle. The full range driver will need a Zobel and a crossover which places passive circuit elements in the signal path. If you build a sealed box for the full range driver, you have an acoustic 12 dB/octave crossover that can be tuned by the box volume. A ported box produces a 24 dB/octave roll-off. The closed box does have an advantage of controlling dirver deflection so Xmax is less of a concern. Then all you need is some form of crossover for the sub. Either of these approaches is an easier build compared to a back loaded horn. The full range driver never sees bass frequencies so destroying the driver is probably not as big of a concern. If a full range driver in a sealed box is paired with a high efficiency woofer to produce a system that is 95 to 100 dB efficient, for 1w/1m, from 30 - 40 Hz up I believe it would play plenty loud and not risk distortion or driver damage. A 15 or 18 inch woofer will move a lot of air. Room placement is no longer a requirement to get bass. This system might be very compact.So I am not trying to compare a full range driver in a back loaded horn to one in a sealed box. I am comparing a back loaded horn and sub system to a full range driver in a sealed box and sub system and wondering why the simple build would not be as effective as the complex build. What extra does the back loaded horn add to this type of system?Martin

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Subject: Re: a good question
Posted by roncla on Fri, 05 Aug 2005 10:51:52 GMT
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What extra does the back loaded horn add to this type of system?Dynamics and speed.Efficency is there also. Sure a horn will not hit the 30s, but if it can hit the 50s there is just so much more there than a vented cab ( we are talking low Qts drivers here). I have started a new project in running some sims in a loaded low Qts driver in a MLTL. IMO and from what i have seen in the sims is that by loading a driver in the form of a filter chamber/throat and installing it into a MLTL is that greater SPL can be produced without breakup and still hit the low frequencies and at the same time provide for a cut off at a point (still working on this) so that the upper harmonics of the TL action have less effect so stuffing can (possibly) be eliminated. It still probably wont have the dynamics of a horn though. Although with a Flare at the end it appears to lessen ripple and may provide for more apparent dynamics. Dynamics is something i cant sim at the moment.ron

---

Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Fri, 05 Aug 2005 12:39:00 GMT
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I agree Martin. That's one reason I don't get horns built. If you are using the driver at 90-100 HZ and up, and have a steep crossover like 24 db, then there seems to be no point to making the horn. I have also found that using "full range drivers" at 80-90 Hz up takes away none of that

single driver magic, in terms of imaging, as opposed to flogging that poor beast down to the nether regions of bass. This is based on my experiments, mainly with the stephens trusonic 80FR driver.-akhilesh

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Subject: Re: Why won't a single driver speaker do metal?
Posted by akhilesh on Fri, 05 Aug 2005 12:39:35 GMT
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Too True, Dave.

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Subject: Re: SOme comments on this thread
Posted by akhilesh on Fri, 05 Aug 2005 12:40:57 GMT
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Lots, John. And fellow music system maniacs and Altec owners are especially welcome!-akhilesh

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Retsel on Fri, 05 Aug 2005 13:56:43 GMT
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Ed has provided many of the same reasons I would give. First, lets start with the Hedlund Horns. Just listening to them makes the reasons obvious. I had a couple audiophiles over about a month and a half ago and their jaw was on the ground after listening to my system, and my subwoofer was in disrepair so all they heard was the Hedlund Horns. To me, the lack of deep bass makes the system lacking, but 70 hz and up, the sound is simply glorious. Besides the world class SACD player, preamp and amps, the Hedlund Horns with DX4s are wonderful.It is useful to compare how the Lowthers mate with the Hedlund Horns compared to open baffles. I will refer you to a post which Paul Joppa made on the Magnequest forum because he knows a lot more about the theory why BLH work so well:http://www.audioasylum.com/forums/magnequest/messages/2737.htmlAnd Paul is right, with the Lowthers in Hedlund Horns, the response is flat. Thus there is no need to add crossover components. The added energy and efficiency of the backhorn down to below 100 hz allows for using subwoofers for what they are designed for, reproducing the lowest frequencies.Now I am experimenting with open baffles. I need to work on my baffles more, but there are differences which I can comment on. The open baffles are more transparent and for sounds above the horn region of the Hedlund Horn (which is around 250 hz), the open baffle seems to be better. I might give the nod to the Hedlund Horn below this frequency, but it is too soon in my experimentation to say all this with conviction (I still need to finish my experimentation with the open baffle first and

then put the Hedlund Horns back in place before I can decide for sure). The open baffle system needs an inductor to roll off the higher frequencies starting at about 500 hz. I am only using a single inductor instead of the much more complex crossover which Dick Olsher has in his plans for the Basszilla project. I am highpassing the Lowthers in the open baffle about 100 hz, and still the cone moves a lot. But I hope that I can live with this as I have a pair of 15 inch drivers and also a set of Avalanche 18 inch drivers which I hope, together, will allow me to get sufficient bass from 20 hz or below up to 100 hz as dipole woofers. I am a little worried that the Avalanche drivers will be too "slow" crossing them over at 100 hz. If so, I can always revert back to the Hedlund Horns which can go deeper. Considering that open baffles are fairly easy to implement, and I already have the Hedlund Horns, I would not even consider trying a simple box. I would do the open baffle before trying a box. I have a set of Fried C5s, which are VERY high quality transmission line mini monitors. I thought about trying the Lowthers in those boxes, but I believe that they would not be a good match for transmission lines.Retsel

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Retsel on Fri, 05 Aug 2005 14:13:15 GMT
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After I put the supertweeter in place I am still not convinced yet that it is a worthwhile investment (I should disconnect it to see). It does add a little air, but I might have taken that money and invested in a little better set of caps for my SE amps and ended up ahead of where I am today. It is a marginal investment because the DX4s get up pretty high on their own.With tipped up response of the Lowther DX4s on open baffles I need to use some sort of means to flatten out the frequency response. With the the super tweeters there I need to put a series inductor in place. It would be interesting to do away with the inductors and go back to trying a shunt capacitor instead of the inductor thus placing no passive components in the signal path of the Lowther (which of course would make the super tweeters useless, unless if I provided them their own amps.....).Retsel

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Subject: Re: a good question
Posted by akhilesh on Fri, 05 Aug 2005 17:36:05 GMT
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Ed wrote:"That is a good question.....why WOULD someone go to all that trouble when a simple OB or sealed enclosure would be so much easier to build? There MUST be a reason! And I doubt it's marketing on the part of the builders.....my guess and it's only a guess.....Efficiency, dynamics.....and to achieve a balanced response down to cut off with out sacrificing efficiency might be a couple reasons."Ed, my guess (and I have MUCh less experience than you do) is that BLH horns are built if someone is not using a subwoofer. If one is using a sub and crossing the "full range" driver at 90 Hz or so, then I have not seen anyone use a horn. Now, with a real low Q driver that is not really meant to produce a lot of bass, like a 3-4 inch fostex, one may need a horn

to get down to even 80 -90 Hz, in which case it is totally justified. But if one is using an 8 inch full ranger, that can achieve 90 Hz in a simple BR all day long, the reason for a horn may become less obvious. What do you think?-akhilesh

---

Subject: Thank You, Ron
Posted by Ed Schilling on Fri, 05 Aug 2005 17:53:58 GMT
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This is a tough subject. It seems we are (to quote some "Rock Star") in "agreeance". I'll try to add more later but I just got back and have "chores". More on my position later regarding single drivers and the compromises and advantages that are not obvious but easy to hear and difficult to measure. And a detailed but rambling (I'm sure) reply to Martins post. And it won't be a "cat fight"! That won't happen regardless of my "reputation" for "stirring the pot"! We probably agree more than disagree when it really gets to the bottom line.  We are all in this together.....and I guess the goal is to fire the stereo up and have it make us smile. Regardless of the means used to achieve the goal.Ed

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Subject: Re: Thank You, Ron
Posted by roncla on Fri, 05 Aug 2005 18:49:43 GMT
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Well Ed us ole southern boys gotta hang together. But it always comes down to physics ,regardless. Its dang hard to put a number on dynamics, i know i have tried, but all i can come up with is the "speed" of a BLH being faster due to the wave expansion time being slightly less than the 1/4 wave action. Who knows? Trying to figure out all this has become a definate time consumer. BTW and OT i usta live in Ashboro NC , hadda ex  there (forgot which one) and love the area. And aint into guns , but can sink an arrow into a 3" target hole all day long at 50' ( windless or inna building), silent and deadly. Ever make it up there ( i always need a reason to ride my scooter) i will look you up.ron

---

Subject: Re: Thank You, Ron
Posted by roncla on Fri, 05 Aug 2005 18:58:59 GMT
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That won't happen regardless of my "reputation" for "stirring the pot"! If ya aint making waves , then ya aint rowing.ron

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Subject: Re: a good question
Posted by Ed Schilling on Sat, 06 Aug 2005 03:48:54 GMT
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Short answer. I never heard a BR I could live with! Period. 4 inch Fostex will do much better than 80hz in a BLH. I think you might build them because they simply sound "better". But it's late.....more later.Ed"Efficiency, dynamics.....and to achieve a balanced response down to cut off with out sacrificing efficiency might be a couple reasons."

Subject: Re: a good question
Posted by JLM on Sat, 06 Aug 2005 13:04:59 GMT
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Aside from amp/speaker synergy issues wouldn't the correct path take driver T/S parameters into account first? I would first associate high Qts drivers with open baffles, low Qts drivers with BLH, and the middle ground can go sealed, ported, TL, or pipes although there are a few exceptions. I agree with your path 1 assessment. To acheive deep bass (say in room flat response down to 30 Hz) from BLHs, the cabinets must be huge and extremely stiff. The practical alternates are to ignore the lack of bass or somehow augment with a powered woofer. IMO many listeners have unwittingly learned to ignore a lack of deep bass or have never heard deep, musical, dynamic bass and so they underestimate these considerations.Regarding your path 2 discussion: One significant advantage I find in BLH, OB, TL or pipe designs is that they direct the rear wave so as to avoid reflecting back to and through the semi acoustically transparent driver cone to be heard as a time smear form of distortion. Because of this time smearing, I'd love to find more commerically available TL sub options.IMO the dynamics of one speaker cabinet design versus another is primarily dependent on the driver efficiency. Seems that the confusion and debate of cabinet types comes in due to high efficiency drivers which often have low Qts values and therefore correlate most often with BLHs. And so BLH cabinets are praised when its the drivers that dictate the choice of cabinet designs in the first place. Note that the highly praised and approachably priced extended range Visaton B200 driver offers an alternative to BLHs with it's high Qts and high efficiency.I'd prefer to see a sub crossover lower than 200 Hz, but am eager to audition Retsel's Lowther/OB.

Subject: Re: a good question
Posted by roncla on Sat, 06 Aug 2005 13:43:53 GMT
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Hay , i am in total agreement. The way i see it is a seperate woofer and the low Qts driver in a small sealed cab run FR. I simmed some of the cheap Pioneer drivers and even with a Qts of .25( 15" driver) i could see an Fc around 30 Hz with a BR cab. Just bi amp and roll off the sub/woofer at a good XO point and there ya have it. A very simple cab, but will require bi amping for good

performance. Having run several tests i still find that the Qts of the woofer/sub should be close to the Qts of the FR ( OK , lets call it wide band) driver. The SPL of the 15" was the same as the 206e and paper cone , so it should( that word again) be a very good match and a simple build. I believe the main reason i got into BLHs in the first place was the technical challenge and just to be different. The only reason i am not a fan of such designs as the Basszilla is the large footprint and the required XO electronics. IMHO a properly designed sealed cab for the wide band (designed for 150-200 hz roll in) is the way to go.( at this moment in space and time)ron

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Subject: Ok Boys, read this.....
Posted by Ed Schilling on Sat, 06 Aug 2005 17:02:21 GMT
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We do all agree that Enter Sandman by Metallica is "Metal", right.....The amp is the X150.....the speakers are a 4"BLH. The speakers are in corners..the room is 16 X18. The SPL was at the couch. The distance from the right and left speaker to the SPL meter was 15 feet. My buddys' name is Larry....he is a musician and plays around town a couple times a week. Believe this or not. I don't care. This is in his own words.....I'm Larry, and I just sat here 15 feet away from the system listening to Metallica playing Enter Sandman @ 106 db peaks. The average volumn during the quiet portion of the song (the speaking part) was 100 db. I could detect absolutely no audible distortion at any point. In other words, the system kicked ass! Yes..I am a musician; and I know what loud music is supposed to sound like. The bass response was just fine, and there was certainly no need for a sub woofer at that volumn. I have previously listened to the system with a sub woofer, and it probably sounded a little better at low volumn; but I never really thought it needed one.And that's the way it is....and all he would type! I simply asked Larry to type what he heard. Now, other than a BLH....exactly what single driver design with a single 4" driver, can make those SPL's? A TL, a BR , a sealed.....well not that I have been able to see actually demonstrated. Keep in mind we are talking a 4" single driver, not an 8, not a multi driver, but a single 4" driver. It seems that a BLH just might have an efficiency edge over other designs, unless of course one of them can achieve the same outputs using a COMPARABLE size driver. The BLH is a much more efficient type of design, I have found. I will give examples of real speakers in my next post....which may not be until tomorrow. In the mean time and I have said it over and over....in the world of single driver speakers....efficiency and small cones are your friends. Excursion and low efficiency is your enemy.....My opinions OK.Ed BTW...I did not edit or spell check Larry's writings!

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Greg B on Sat, 06 Aug 2005 17:15:37 GMT
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Since no one else has pointed it out: 'metal' is not dynamic music. In fact, it's severely limited and almost the opposite of classical. Massive amounts of compression are used in recording and

mastering, aside from the natural compression of marshall amplifiers in overdrive. I've rarely found any metal to sound good on horns or other dynamic speakers. It is mastered to sound good on typical home stereos. Metal sounds best IMO on lower efficiency but fairly large multiways, but can be OK on low efficiency single drivers, like say the cheap delco fullranges in your camaro... I've listened to enough metal as a teenager for one lifetime already, but that's a different subject. To sum it up, I think it's more a matter of efficiency and low distortion. Heavily produced rock and metal thrive on a bit more compression and squashing of the peaks even at the playback end; while classical, jass and other well recorded music sound best with higher fidelity. I doesn't surprise me that little fostex FR's in small backhorns sound pretty good with metallica, as they are not that efficient and no doubt squash dynamic peaks. Greg B

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Ed Schilling on Sat, 06 Aug 2005 17:27:00 GMT
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I agree to a certain extent Gregg. About the way  recordings are made, for one. But do keep in mind the subject was " Why won't a single driver speaker do metal?"  NOT , " Why won't a single driver speaker do Classical, jazz or other well recorded music"?I hope you're not saying they don't!  I'll  get some SPL readings on some of what you call "dynamic music" as well. And post them....regardless of the results.Ed

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Greg B on Sat, 06 Aug 2005 19:44:55 GMT
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Hey Ed,No, I'm not saying that at all, in fact that's their forte. But not all single drivers are the same for sure. It was interesting for me to try the FX200 in both the factory BR and a TQWT of my own design (with help from Martin King's software). The BR was less dynamic for sure but seemed to take the edge off rock and other 'produced' recordings, and the ~4kHz peak inherent in the driver's response was much less noticeable in casual listening. The TQWT was designed to have enough gain in the upper bass to not need BSC. Overall, the measurements were quite similar, but of course the BR did not go as low. BTW, the factory BR design is a bit high tuned and warm sounding, which seems to be intentional - to negate the need for electrical BSC. Anyway, the TQWT was certainly the clear winner in terms of high fidelity and was remarkably lifelike. OTOH, the BR was much more forgiving, but sounded like a stereo rather than the real thing. So, here we have a situation with the same driver, where one enclosure might be more suitable for classical and other dynamic recordings, and the other better for rock, etc. BTW, since I'm moving in a couple weeks and will no longer be in a converted warehouse, no more huge format HE system for me.  I think I'm going to try my FE108E sigmas in backhorns... They're really my fave fostex so far, and I've tried quite a few.  Maybe I can make my big TL sub a couch?? Rgds,Greg B

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Subject: 10-4 !
Posted by Ed Schilling on Sat, 06 Aug 2005 19:53:29 GMT
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Gregg,Not surprised with your results! Good job in actually comparing the two. I never heard BR I could live with.Ed

Subject: Re: Why won't a single driver speaker do metal?
Posted by Wayne Parham on Sun, 07 Aug 2005 08:01:01 GMT
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I think the problem to overcome is three-fold, one being upper extension, another being intermoduation and the other being X-Max. The thing I've seen most single drivers do best is mid and highs, which leaves the designer to focus on a cabinet that improves bass response.But no matter what you do - horn, reflex or transmission line - the bandwidth required is the same. A single driver is required to cover the entire audio band. That means the intermodulation issue is the same cross to bear for each of the three designs. And while excursion is limited at certain frequencies in each of the above mentioned designs, you still need to have displacement to generate bass, and that means excursion.

Subject: Re: Ok Boys, read this.....
Posted by Wayne Parham on Sun, 07 Aug 2005 08:03:42 GMT
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Well, my buddy Larry said MY speakers were best. No hard feelin's, Ed. Just had to say that, just for fun.

Subject: Re: Why won't a single driver speaker do metal?
Posted by bob pace on Sun, 07 Aug 2005 12:06:39 GMT
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I saw your thread and read it, noting as usual some folks give opinions based on theory instead of experience. To my way of thinking, if you have not listened to a particular speaker, amp, or anything else, you cannot accurately describe how that particular product performs. I just happened to be in Florence last week on business and to make a long story short Ed Shilling was gracious enough to invite me over for a listen to his single driver horn speakers. First of all, those horn speakers will play metal at insane volumes - 108 db peaks measured at 14 feet from

the speakers - undistorted.  Metal at that volume is not my cup of tea, but they will do it.  Ed had 3 amplifiers available to listen to - a First Watt 10 WPC solid state, a Pass 150G 150 WPC solid state, and an Audio Note 7 WPC 300B tube amp.  Each amp sounded different, the 150G drove the speakers to the 108db peaks, the 300B amp got them to a respectable 102 db as well.  Both solid state amps sounded a bit strident at higher volumes - not overly so, and the 300B seemed to tame that characteristic completely.  Overall the 300B was the best - in my opinion - once it warmed for 30 minutes everything just came together.  The sound was open, dynamic, and 3 diminsional.  The bass is adequate and very tunable by room position with adequate treble extension as well.  The bass is not there below say 40 hertz, so if you want the low bass that is more felt than heard, you will need to augment it with a subwoofer.  Most folks don't know the difference between real bass below 40 hertz and a bass peak around 60 to 100 hertz and won't miss it.  I would compare these to a pair of JM Labs Micro Utopias - high dollar monitor speakers that sell for $6500 a pair and have similar bass response but are not quite as dynamic.  I have listened to the Micro Utopias enough to make this statement.  As far as looks go, the JM Labs are the hands down winner, although the new veneer finish is very attractive.  If I was not already addicted to the lower octive bass and completely satisfied with my current speakers, I would purchase these immedietely and find out if they would work in my listening room.  At under $800 a pair, they are quite a bargain in the world of high end audio.  This is of course opinion on my part and I don't expect everyone to agree with my opinions.  The key difference is I actually listened to the speakers before voicing that opinion.Bob

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Subject: Re: Why won't a single driver speaker do metal?
Posted by roncla on Sun, 07 Aug 2005 12:34:16 GMT
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Based on my recent back loaded horn modeling, I believe that your speakers are acting like a TL at the lowest frequencies and transition into horn like behavior probably above 100 Hz. Nothing wrong with that design method and it is the one I am exploring for my own back loaded horn speakers. Having the strong undamped TL resonance helps the bass outputSo very true! Heres a quicky method (accurate, no way, but it gives an idea of a basic BLH low FR concept). Take the tuning length until just before the final flare section. Calculate the TL response based on 1/4 wave action(straight TL), add 10 Hz. This will give the lowest frequency (approx) when wall/floor loaded. Corner loading will mean subtracting 10 hz.(given the proper room dimensions). Even Dr Bruce has stated that 1/8 mouth size had never given the calculated response when corner loaded. Yea, its a rough silly Kentucky windage/SWAG type calculation, but i have found it to be very close in many horn designs. In my designs and sims i see that 1/4 wave gives the lowest initial boost then horn action kicks in then the compressed 1/4 wave action (harmonics) enters into the picture(later in frequency). Thats the upper ripple that so many see at the limits of the horns BW. The 1/4 wave action (upper harmonics) and the horn action combine. And if its designed correctly there will be minimum ripple.ron

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Subject: Re: Why won't a single driver speaker do metal?

Posted by Wayne Parham on Sun, 07 Aug 2005 12:57:43 GMT
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When you say, "some folks give opinions based on theory instead of experience", I'd like to make sure you understand that many of the people on this thread have a wealth of experience.Bob Brines made a statement of fact. He said, "Single-driver full-range speakers have a limited dynamic range." This is true of all speakers, but I think what he meant is that single driver speakers are limited more because of their unique characteristics. It wasn't about a particular implementation, it was about any speaker with a single driver.By the way, what was used to come up with those SPL figures you quoted? There is a lot of specific information in your post, so I'm sure you must have this information handy. Point source sound falls off at the rate of 20 log d1/d2, so you can see that 108dB at 14 feet is about 120dB/M - pretty strong stuff. Those are prosound levels, amazing from a 4 inch full range speaker.

Subject: Re: Ok Boys, read this.....
Posted by Ed Schilling on Sun, 07 Aug 2005 13:31:14 GMT
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Ha Ha! Very funny Wayne! Seriously though.....I hope like Hell you guys know that was not the point! He did just "verify" the numbers I have claimed from the beginning! Getting Larry to say something "not true" would be like pulling a donkey down the street by his tail! He would not give his "opinion" on the system....he just reported the readings and what he heard.And yes, Wayne, that was funny to me! You've at least talked with me enough to know for sure that was not the intent of my posting his comments...(he actually typed it all)..I hope everyone else does as well!Ed

Subject: Re: Why won't a single driver speaker do metal?
Posted by bob pace on Sun, 07 Aug 2005 18:06:33 GMT
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Hey Wayne,My post was to a specific speaker, not a generalization. The statement "some folks give opinions based on theory instead of experience" is based on 25 years of high end audio interactions. Like anything else, you find armchair experts that have not experienced what they are commenting about. I try to keep an open mind and realise that even if something does not make sense from a theory standpoint it does not make that something untrue. The measurements were taken with a Radio Shack analog spl meter at couch level 14 feet from the speakers. Anything over 100db and I had to plug my hears to protect my hearing. I like listing in the 80's to low 90's tops to all types of musics. Concert level playback is not my normal mode of operation, but if you want it - these speakers can do it with that 7 WPC 300B amp. The room size was approximately 17' by 15' - I did not measure the room so this is an approximation. Let me make something perfectly clear - this post was meant to convey a listening experience with the Horn Shoppe Horn speakers from a 4 hour listening session. It was enough to convince me of the

special nature of these speakers.  Will they work for everyone?  I doubt it.  Are they worth a try?  Absolutely, if your in the market for some phenominal point source speakers that are open, 3 diminsional, and rather dynamic.  It was amazing to me how well they worked at Ed's place with basically no tweaking to positioning and cabling.Bob

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Subject: Re: Why won't a single driver speaker do metal?
Posted by Wayne Parham on Sun, 07 Aug 2005 18:59:57 GMT
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I have no doubt that the speakers are nice.  I'm anxious to see and hear a pair, hopefully at next year's GPAF.  But I don't think they're capable of 120dB at one meter.  What I think, is that they have just about the same maximum SPL as most other single driver speakers using similar Fostex drivers.  That's plenty, and would make them very satisfying indeed.  Will they play heavy-metal rock? Obviously they will and whether a person thinks they're loud enough is probably a matter of personal taste.

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Subject: Re: Why won't a single driver speaker do metal?
Posted by hurdy_gurdyman on Sun, 07 Aug 2005 19:50:31 GMT
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>Will they play heavy-metal rock? Obviously they will and whether a person thinks they're loud enough is probably a matter of personal taste.

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Subject: Further thoughts on peaks and some clarifying questions
Posted by akhilesh on Mon, 08 Aug 2005 06:42:12 GMT
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THanks for your opinion, Bob, more so since you actually listened to the horn shoppe speakers. Could you tell us what frequencies you measured the 108 db peaks at, and what the distortion was at the 108 db peaks? When you say the amps sounded a bit strident, are you sure it was not distortion on the part of the driver? It's unreasonable to expect a 4 inch driver to do 108 db bass peaks (say in the 50 HZ region) without significant distortion, in general. So i don't think anyone would fault Ed's design (which I am sure sounds wonderful, and we would all LOVe to hear) if it "only did 102 db peaks in the 50 Hz region". Doing 102 db peaks with a 300B amp (about 8 watts max) leads me to believe the efficiency of the hornshoppe speaker is around 94-95 db. It is reasonable to expect the driver to do undistorted peaks of frequencies above 100 hz upto maybe 105-110 db, depending on the wattage of the driver. Overall, I don't think Bob Brines & Ed are disagreeing a whole lot. I have actually heard Bob Brines's speakers (almost all his models) and they are very nice. I think they will do 105 db peaks as well, above 100 hz. below that, no, and in

fact most single driver systems won't, at least not without increasing distortion. Again, I reiterate, a single drive comparo between bob brines's speakers (based largely on Martin's designs) and Ed Schilling speakers will be awesome. Based on reviews I have read of Horn Shoppe speakers, they probably sound very good too. It will be a real treat to hear a comparison, and to see the differences between them. Again, ED, PLEASE do ship a pair of speakers for the next GPAF, even if you cannot make it. -akhilesh

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Subject: Re: Further thoughts on peaks and some clarifying questions
Posted by bob pace on Thu, 11 Aug 2005 18:47:15 GMT
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I can't help you with frequency ranges for the peaks as we were listening to a variety of music. I think we really cranked it for "Suzy Q" and the peaks on the Rat Shack meter were at 108. The "strident" sound is what I typically hear in the treble from alot of solid state amps. The Audio Note 300B tube amp tamed that characteristic completely. I would not say it is distortion, but rather an undue emphasis on treble. Keep in mind this was an ears test for the most part - the SPL meter just provided a reference which I did not really need since my ears already told me "it was loud" louder than I would ever need to listen. The other point about Ed's setup is it is not tweaked. There are no fancy cables or spikes for the speakers or any resonance tuning weights. With the right cable combo and tuning weights you could make these puppies meet your own version of sonic nirvana.Bob

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Subject: Maximum SPL charts
Posted by Wayne Parham on Mon, 12 Sep 2005 11:02:03 GMT
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Here's a chart that will help quantify matters. Below is an SPL chart based on Fostex specs. Add

which of course assumes that X-max is not an issue and that there is no compression. In other words, the maximum SPL listed here is rather optimistic.[Model][size][SPL at 1W/1M][Max power][Max SPL at 1M][Max SPL at 10 feet][Max SPL at 15 feet]==========F83E 3" 88dB 10watts 98.00dB 88.25dB 84.75dBF120A 5" 89dB 30watts 103.75dB 94.00dB 90.50dBF200A 8" 90dB 80watts 109.00dB 99.25dB 95.75dBFE87E 3" 89dB 15watts 100.75dB 91.00dB 87.50dBFE103E 4" 89dB 15watts 100.75dB 91.00dB 87.50dBFE107E 4" 90dB 15watts 101.75dB 92.00dB

5" 93dB 45watts 109.50dB 99.75dB 96.25dBFE127E 4.7" 91dB 45watts 107.50dB 97.75dB 94.25dBFE166E 6" 94dB 65watts 112.15dB 102.40dB 98.90dBFE167E 6" 94dB 65watts 112.15dB

100.25dBFE206E 8" 96dB 90watts 115.50dB 105.75dB 102.25dBFE207E

120watts 117.75dB 108.00dB 104.50dBFF125K 4.5" 92dB 50watts
109.00dB 99.25dB 95.75dBFF165K 6.5" 94dB 70watts 112.50dB
102.75dB 99.25dBFF225K 8" 96dB 100watts 116.00dB 106.25dB
102.75dB