Subject: A little TAD, Beyma comparison
Posted by jlharden on Sun, 06 May 2001 16:40:39 GMT
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Hi Wayne and Guy's!Since discovering that the Beyma and RCF lf motors could be purchased at "nice" prices I've been plugging lot's of them to see what of interest if anything I'd come up with. The TAD drivers are of great interest to me as well, but I'm less interested in their pricing!Beyma makes one driver that's of particular interest as it's specs are quite similar to the TAD TL-1801, which is the TL-1602's big brother. TAD 1801Vad 17.7Qd 2.7Fd 26 hzEnclosure 6.56 ft3Ideal Fr 27.34Ideal Q 40.5Encl. Fr 27.34Encl. Q 6.34Beyma 18LX60 Vad 17.67Qd 2.7Fd 27 hzEnclosure 6.5 ft3Ideal Fr 27.34Ideal Q 40.5Encl. Fr 27.37Encl. Q 6.1When I plotted the recommended PiAlign enclosures I got the following data:TAD TL-1801 F3 40 hzF10 25.8 hz Beyma 18LX60F3 42 hzF10 26.5 hzBy comparison the TL-1602 offered 42.7 F3 and 31.4 F10. The 18LX60 is the third woofer down in the Beyma line. The other's may offer better overall performance with less extension.(speculation) I highlighted the 18LX60 because of it's very similar performance to the TAD's. It looks like an affordable alternative for someone wanting to get well into the 20 hz. range. Any opinions?

Subject: Re: A little TAD, Beyma comparison
Posted by Randy Bey on Sun, 06 May 2001 20:32:31 GMT
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What's the price differential? This determines what compromises are acceptable.

Subject: Re: A little TAD, Beyma comparison
Posted by jlharden on Sun, 06 May 2001 21:10:42 GMT
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Hi Randy, Who said anything about a compromise? You can get the Beyma for less than half (if I remember correctly) the msrp price from www.musiciansgear.com $178.32 + shipping

Subject: Re: A little TAD, Beyma comparison
Posted by jlharden on Sun, 06 May 2001 22:03:03 GMT
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Sorry, forgot to mention the TAD is $710.

Subject: Re: A little TAD, Beyma comparison
Posted by Randy Bey on Sun, 06 May 2001 23:34:41 GMT
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Sorry, the specs alone are meaningless to me.I take it you are satisfied that the Beyma sound better than TAD?

Subject: Re: A little TAD, Beyma comparison
Posted by jlharden on Mon, 07 May 2001 00:38:52 GMT
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From an electrical standpoint the drivers appear to be practically interchangeable, how this equates to real world performance I don't know. I'm mearly flirting with the idea that megabuck performance could perhaps be attained at a more attractive price. I've been toying with lots and lots of driver parameters in an attempt to better understand the mechanics of the speaker design. I'm attempting to squeeze the last attainable bit of performance from whichever motors I choose. I feel that Wayne's enclosure alignments will allow this and I want to select the motors that achieve all the criteria I'm desiring.You are a Klipsch owner? I am a previous Khorn owner. Not since we parted ways have I heard that level of sound. My hopes when I first came across the Pi Speakers site was to get something close to the Khorns performance, but now I feel that if it doesn't surpass old faithful in every conceivable way that there's probably something amiss. Have you ever opened up your horns and looked what's inside? It's pretty amazing that they can sound the way

they do with the "guts" they've got. I can't help but to think that with motors of a magnitude better quality, superior crossover components, and good engineering we're on our way to something special. Have you considered building some Pi Seven Cornerhorns so you can give us a blow by blow? Would be fun!

Subject: Cornerhorn approaches
Posted by Wayne Parham on Mon, 07 May 2001 05:54:12 GMT
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The Klipschorn is a truncated folded basshorn that makes use of the room corner to reduce response ripple. It also runs midrange frequencies well above middle C through the labyrinthene passages of the horn folds. Its strength is its horn loading which reduces excursion and therefore reduces distortion. Its weaknesses are compromised horn loading because of truncation, dependence on corner quality to improve horn loading, ripples in bass response because the horn is truncated, midrange passes through basshorn, ripples in midrange response because it passes through the basshorn up to 400Hz and standing waves develop within the passageways, incoherent summing due to path length delay, and ripples in response near crossover points due to incoherent summation.That list may make it sound like I don't like Klipschorns but that's not true at all. In fact, it is what inspired the Pi cornerhorn design. I like the idea of launching sound from the corners because it imposes a maximum 90 degree radiation angle over the entire audio band, providing 9dB increase over freespace. It makes a good position for placing controlled directivity loudspeakers to provide uniform coverage throughout the room. But when I looked at the list of strengths and weaknesses of using a truncated basshorn, I decided to remove the horn and use an overdamped direct radiator instead. I like horns, but if the disadvantages outweigh the advantages, it's time to ditch the horns. That was my conclusion in this case.If you think about it, the Klipschorn bass bin forms the compression chamber and throat of the basshorn, but the room's walls form the larger part of its body. That's a pretty good approach, but it does bring in the complications I mentioned above. If it were only used to around 100Hz and blended with a midhorn that could cover the low midrange up, that would be a vast improvement, in my opinion. But then there is still the matter of path length, and I think the midhorn and tweeter would need some delay to get summing right. And since the bass bin is really just the throat anyway, it occured to me that using the corner's expansion from the apex as the horn in toto might be a useful simplification. After all, the corner expansion has the shape of a horn too, albeit a conical horn. It is very simple to implement, increases sound by way of reduced angular coverage, and provides a useful launch point. These were my thoughts when coming up with the Pi cornerhorn approach.The strengths of the Pi cornerhorn bass bin are simplicity, small path length and relative independence on corner quality. It is an overdamped vented cabinet with gradual rolloff that conjugates room gain nicely. As such, if used in a corner that is not optimal, there will be less impact on overall response. You may not have the same amount of bass, but what you have won't be peaky like a truncated basshorn is. Some would make the argument that room modes swamp the response anyway, but I think that's a cop out. All rooms are different, and not all

rooms have modal problems that approach the peaks and valleys that a truncated basshorn can make. I think it is probably better to make a speaker with nice smooth response to start with.One of my personal preferences is to make use of good quality drivers with flux-stabilized motors. The magnetic circuit is a crucial part of a good quality loudspeaker. It isn't just a matter of using a strong magnet and putting a voice coil in the gap - the best drivers pay careful attention to the magnetic circuit so that flux surrounding the voice coil is symmetrical and that the flux surrounds it with equal intensity no matter the drive level or position of the voil along its travel. This is not a trivial matter, and the difference in quality levels between the best and the worst is probably 1000-fold in terms of linearity. Even when looking at good drivers, you'll see a 50x difference in distortion between similar drivers just by adding a shorting ring to reduce flux modulation. So my preference is to get the best motors you can afford.

Subject: Wayne, how about Lambda?
Posted by DFaulds on Mon, 07 May 2001 14:32:47 GMT
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Wayne, you have posted a very complete and thorough explanation of the benefits of the Pi cornerhorn contrasted with the Klipschorn. Thank you. I was wondering whether or not you have used/tested any of the Lambda Acoustics motors? Lambda divers use a special copper faraday ring that extends the HF range of their woofers, as well as significantly reducing distortion. This is right in line with what you are saying and I would expect them to be perfect for Pi cornerhorns. They are also very reasonably priced.

Subject: Beyma distortion vs. frequency graphs
Posted by jlharden on Mon, 07 May 2001 17:45:34 GMT
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Check out Beyma's website at www.beyma.com. They have lots of info, and every driver has tech info plus graphs for distortion, frequency response, time response, free air impedence, voice coil inductance, etc. I don't have a specific price sheet in front of me, but I don't think the Beyma's are all that inexpensive. I believe the retail on their upperline woofers (15"-21") ranges anywhere from $300-$800. I do know that I can do much better than retail however, which is why I'm considering them. If you get a chance take a look at the Pro series low frequency section of thier website and let me know your thoughts.

Subject: Re: Beyma distortion vs. frequency graphs
Posted by Wayne Parham on Tue, 08 May 2001 05:21:35 GMT
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They look like very good parts. In particular, I looked at the Beyma 15LX60, and it is comparable to the Eminence Omega 15 or JBL 2226. I think they might be worth a try.In regards to sound quality, I think the Beyma 15LX60 might be a good upgrade for an Eminence Omega 15, but I don't expect it to sound as good as a JBL 2226. Notice the distortion chart, 2nd and 3rd harmonic content averaged about 50dB less than the fundamental at one watt. Compare this with a JBL 2226. Distortion doesn't rise to this level until 60 times this much power is applied. So the JBL 2226 is better in terms of non-linear distortion.

Subject: Re: Wayne, how about Lambda?
Posted by Wayne Parham on Tue, 08 May 2001 05:27:20 GMT
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I have not used or heard any drivers from Lambda, but they sound interesting. JBL began using Faraday rings in their woofers when they shifted from alnico to ferrite structures. Alnico resists flux modulation much better than traditional ferrite magnets with steel pole pieces. So JBL puts a conductive ring in the motor to counter flux modulation. In my opinion, this is the difference that makes JBL drivers of the last 20 years or so sound so good.