Subject: 'way down deep' Article
Posted by Mike.e on Sat, 11 Jun 2005 00:40:45 GMT
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Hi guys an interesting HT subwoofer article that I have found,again!I hate it when you lose things online!Includes contrabass.In this multi-part review, home theater designer Keith Yates gets down and dirty with some of the most ambitious subwoofers on the planet. Six months, 5000 measurements, four dozen batteries, three sore backs, and two big bare spots on the lawn, all for one thing: to get to the bottom of the bottom end, to separate Real Wallop from Codswallop.
Mike.e

Subject: Re: 'way down deep' Article
Posted by Wayne Parham on Sun, 12 Jun 2005 19:32:48 GMT
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Nice link, thanks! That Genelec sub sure looks nice! I didn't see a Contrabass writeup. No basshorns either.

Subject: Re: 'way down deep' Article
Posted by Mike.e on Sun, 12 Jun 2005 22:17:25 GMT
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I didn't see a Contrabass writeup. No basshorns either. The other articles are reached from the FIRST page I linked near the beginning. I didnt realise this until I was searching frantically for the rest of the article,its not laid out in the best fashion.No basshorns in this article,maybe the T36 could be included to compare.Nice to see the contrabass doing its thing !! THD is so funny on that beast with increasing SPL 'honey,the sub has to run this loud or it doesnt work properly!'Mike.e

Subject: Re: 'way down deep' Article
Posted by Wayne Parham on Mon, 13 Jun 2005 10:31:51 GMT
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Found it this time. I looked through each of the reviews at the links below and didn't see it the first time. But then after you said the link was near the beginning, I looked and found the "page two" link. That's where it is.You know, linear motors are much more precise than commutated motors. That's why the results were measured as they were. When large signals are used, the lack of precision is lost in the scale of the movement. Very minute details are lost.Disk drives either use

linear motors or stepper motors to control the heads. The location is very critical, and you need to be able to move the heads rapidly to a very precise position. So linear motors are used, which can position rapidly and precisely. Steppers motors can also be used, where each step represents a track. But you can't use a commutated motor because it isn't precise enough.Still, you get a leverage benefit by using a commutated motor and pulley. It's a pretty clever deal. Engineers always passed it by for loudspeakers because of the precision issue. The cone was never expected to move very far, so precision was more important. But when large excursion became more important, that made the commutated arrangement have its place.I mentioned this on another site, but it got lost in the noise of that site. The main point I wanted to make was that I wouldn't recommend it for high-fidelity use because of its lack of precision. I can see it having a place in theme parks and exhibits, places where you want the effect of low frequency rumble. But I'd much prefer a high quality woofer with a linear motor for true fidelity.Another thing I've said a few times that sometimes gets overlooked is the point that basshorns don't really do fidelity when done small. I mean, really, how does one expect to actually have a 20Hz basshorn unless it's very large? When I see folks using prosound basshorns in their homes, I think it's not really the best way to go because they're just too small.I like horns, and I use them everywhere I can. But I'm also a realist, and the fact is that a basshorn is more like a tuned pipe, and it just isn't big enough to act anything like a horn down low. It's a resonator at best, so I think there are better ways to make a system perform well than to use a 40Hz horn and push it an octave below that. All that will do is give a whallop of a peak at 40Hz, followed by big dips on either side. It's great for clubs, but probably not what I'd suggest for a home system, at least not if high fidelity is desired.That's one reason why I like depending on the corners so heavily - By forcing the bass to radiate from the apex outward, corners reduce the radiation angle enough to provide 9dB increase over omnidirectional radiation. That's pretty significant, if you think about it. It's the same as you'd get from a 70º horn and it doesn't require a labyrinth of ducts that introduce response anomalies and panel vibrations. If a person were to make their basshorns large enough and rigid enough to solve these problems, I'd be all for them. But short of that, I say leave the boom/buzz boxes in the clubs where they belong.

Subject: Re: 'way down deep' Article
Posted by Mike.e on Tue, 14 Jun 2005 00:33:38 GMT
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Thats true people have to just bite the physics bullet.The system that 'won' was simply ~4 x 12" woofers,they shouldve compared similar sized systems,or similar displacement for more apples vs apples comparison,but its still good.There are a few funny systems around- just look at the linkNotice how servo feedback systems simply dont occur in this top end stuff,must be too hard to implement or simply not effective enough.Mike.e
heavy, non portable monster from NZ company

Subject: Re: 'way down deep' Article
Posted by tomservo on Sun, 07 Aug 2005 17:40:28 GMT

Hi WayneI know you have a historical problem with me personally and so too my designs, that's your option, but in the interest of perspective I would say a few words for the Contra bass.It is smaller and lighter than some of the more powerful subs tested, uses a lot less power than some, doesn't require a processor, its low frequency output equaled or exceeded the most powerful sub tested over all and it costs less than many too.It is a 20 years old design of mine, competing against current state of the art "cost is no object" stuff.To expand your mention of VC linear motors, yes they approach perfection the closer one is to zero signal, a commutated motor gets progressively better as it approaches max signal. Depending which end of the systems dynamic range is more important to the user or the size issue where the Servodrive also has an edge, that governs which has an overall advantage. You focus on the low level flaw, result of static friction yet fully ignore the strength it has. You'll notice the reviewer said the low end output was equal to the most powerful sub tested and the Contra was as "fast" and precise sounding as the 12 inch woofers.Except for a faint ahh sound he thought he heard at low level with a very low pure tone (and no other speakers on), he did not hear the flaws you fear.In fact, the audible strengths of the ContraBass were enough for the same reviewer (who designs million dollar home theater systems for a living) to specify them in many high end Home cinema's, like the Sultanate of Oman, heck the George Lucas has two double Contra's in his personal home theater.People don't still use Contra's because of audible flaws, there looks or marketing.You comment "Engineers always passed it by" is especially strange , Intersonics policy prevented sales to individuals, the only people we could sell to were engineering types and designers. The hundreds of Contra's and servodrive Horns sold to various Disney parks and the other installation's over the years not to mention the concert tours were all a result of engineering evaluations and listening. While consumers and you perhaps never knew about Servodrives, the engineering / Pro-sound side made the business.Also, for what its worth, a different motor eliminates the static friction, If I still had anything to do with the product (other than being the Inventor), it would have a motor like in patent # 5313127 or a brushless electronically commutated motor.. Even now, making it a closed loop system (as is the norm with servomotors) eliminates the low level issues although at a $cost$.Yes the contra is different than a normal speaker, but I wonder how many other subwoofer designs will still stand up well to the most powerful subs available when they are 20 years old like the contra is? You comments about bass horns are interesting .When you say "don't do fidelity" exactly what do you mean?Do you mean in various properties that can be measured acoustically, or, philosophical "fidelity" as a concept or personal conviction ?FWIW, the advantage a horn like the LAB can have in a room over the direct radiator version of the same driver, is that even well below the low corner, the horn driver may still have less excursion for a given output SPL. On the same driver, less excursion = less distortion.Yes one has to be able to measure and then eq the system flat but if you are in a room you have to eq any sub to make it "flat" anyway. In the range where the horn is really working, one has FAR less excursion for the same SPL and so far less distortion and greater dynamic range with the horn.When you get your Pi 12 running you will hear what the LAB sub folks have been talking about "in room" response and low distortion. In the case of a much more current design than the Contrabass, the PB-12 tapped horn, one to one it is nearly +10 dB over a Contrabass in maximum output, how would you explain the sensitivity, response and output "if" the small horn on one 12" driver did nothing useful? (no eq used either). Cheers,Tom Danley

Subject: Re: 'way down deep' Article
Posted by Wayne Parham on Sun, 07 Aug 2005 18:44:46 GMT
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Listen, everything you've done has been interesting to me, and I think all your designs have been pretty clever. You've done some cool stuff, and I've always been impressed. Not that you need to hear that from me, but I wanted to say it anyway.The areas where we have gotten sideways were all a result of what I perceived as you and Mark Seaton pushing too hard, and exaggerating things to a point where your comments weren't reflecting the truth any longer. I thought the comments you made were either too self-promotional or too exaggerated or both.This is a good example. The commutated motor idea is cool for large movements. But the linear motor is a more accurate positioner at low levels. 'Nuff said. There's no reason to justify or explain these things, it's just how they are. That's why engineers pass over commutated DC motors for disk drives, they're just no good at making the tiny movements needed to position between tracks. They use linear motors or stepper motors with pulleys instead. Same thing for relatively low levels in home loudspeaker systems. If they're running just a few watts, a linear motor is a better choice, as you

meant for home hifi, and I don't see much reason for a basshorn like that for rooms small enough to have a 30" door. It's for outdoor and large indoor areas. From the models and predictions, it looks like it will be a winner.I've been building horn loudspeakers for 25 years. So it's not as if I were new to this sort of thing. But I'd rather have a direct radiator for the bottom octave than a peaky horn. Of course, I'm not saying all horns are peaky. I have always been a horn advocate. But I am saying that the scale of a basshorn makes them prone to being peaky, and I've seen a lot

so I'm satisfied with it.I'm very proud of what I've come up with. It looks like it will really be a winner. I've addressed the things that concerned me the most, and still stayed with a truck pack sized cabinet. Harmonic distortion is reduced by using a push-pull arrangement. Odd harmonics are reduced by being out of the passband. The response is nice even when used alone, and really good when used in groups. And radiated heat is removed better with the heat exchanger. So I think it's a pretty good design.