Subject: Compression Drivers
Posted by rkeman on Wed, 17 Oct 2012 00:28:45 GMT
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Parts Express has just introduced a new 1" compression driver modeled after the B&C DE-250. The Dayton Audio D250P-8 1" Polyimide Compression Horn Driver costs only $50, but appears to match the B&C DE-250 specifications quite closely. If the unit-to-unit consistency is good it may be a real winner coupled to the H290C.

Subject: Re: Compression Drivers
Posted by Wayne Parham on Wed, 17 Oct 2012 03:14:34 GMT
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I suppose it might be worth looking at but I must admit I'm not too pleased with what I think are probably Chinese copies. I'm seeing this happen a lot in audio lately, little companies springing up selling Chinese knock-offs of products from popular brands. Some of these companies are actually sponsoring this "development" in China by sending them the devices to copy.

I don't know that it is illegal to send a compression driver to China to be copied, unless it infringes on a patent. But I'm not interested in supporting that kind of thing myself. I mean, isn't there some responsibility on the part of these companies to do a little bit of R&D in order to be in the manufacturing business, or is it right that they just copy whatever they want?

If B&C wanted to shift their manufacturing to China for cost savings, that's one thing. You may or may not find that to be a good move. But for other companies to do that, to have zero R&D investment, no engineers, no technical talent at all - for them to send a device to China just to have it copied cheaply, well, I find that more than distasteful, I find it downright disgusting.

So I guess you can say I'm not going to be trying the Denovo or Parts Express driver copies. I would suggest to all other hobbyists that the best thing they could do to support ongoing development of quality hifi products is to avoid buying from companies that copy products like those. If the company has no engineering staff, avoid purchasing their "house" brand products, particularly if they have specs that match another popular model. That's my view, for what it's worth.

Subject: Re: Compression Drivers
Posted by rkeman on Wed, 17 Oct 2012 12:45:10 GMT
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Checking the B&C website reveals no patent claims on the DE-250 data sheet or in the company information. The driver materials, diaphragm shape and other features don't appear significantly different than comparable 1" compression drivers and it seems doubtful that there would be

intellectual property issues. The main concern for the consumer would be availability of the product and support. Replacement parts - in this case the driver diaphragm - should be easily obtained. Parts Express is probably as stable a supplier as can be found in the audio and electronics industry at this point.

Parts Express has a history of providing the DIY audio community with a source of quality products no longer available from other vendors. Subwoofers comparable to the long discontinued Adire Audio Shiva and Tempest live on as the Dayton DVC series. They are American made. The QSC horn in the Econowave is only available due to the investment by Parts Express. The company has been aggressive in copying some of the better audio products available and manufacturing some of them overseas. They have also produced many original or uniquely modified products. Many loudspeakers and other audio products fabricated here or in Europe depend extensively on parts sourced from Asia. These are commonly accepted business practices and usually lead to greater product variety and value for the consumer.

The loss of US manufacturing is a very complex issue that carries with it a deep emotional response from many Americans. I have no affiliations with Parts Express and brought attention to this product only to enlighten others. Pi Speakers provides a valuable service to the DIY audio community through this forum and if any distress has resulted from these postings, please accept my sincerest apology.

Subject: Re: Compression Drivers
Posted by Wayne Parham on Wed, 17 Oct 2012 14:23:21 GMT
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Oh, heavens, don't apologize. There is absolutely nothing wrong with discussing new products and alternate sources here. We've shifted suppliers before, and I'm always interested in hearing about new technologies and new devices. For example, the DE250 is a fairly new part for me, I was using the JBL 2426 for years before trying out the DE250. So don't worry that I would want to discourage you or anyone else from discussing new or alternate parts here in this forum.

It's just that I find it really wrong to copy devices. That's just my personal opinion, so I jumped up on a soap box for a minute.

There has been a long legal debate on reverse-engineerng, even before overseas outsourcing was commonplace. There is legal precedence that reverse-engineering is acceptable as long as no intellectual property rights are violated. That doesn't necessarily have to be a patent violation - If a company obtains blueprints or source code or other engineering documentation, they can be in violation of copyright. But as long as none of that has happened, it is legally acceptable to reverse-engineer a product in most cases.

I still find product copying to be an ugly practice, and especially in a company that has no engineering staff, and just sends a product overseas to have it copied. Is it illegal? No, I don't think so. But will I support it? No, I will not. It's a personal choice.

Subject: Re: Compression Drivers
Posted by petew on Wed, 17 Oct 2012 18:26:36 GMT
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Wayne, I agree with you completely on this. Especially on the blatant counterfeit Lab Gruppen amps you see discussed at the big A/V forum site. No different than a fake Rolex or fake Cisco router. Those should be confiscated at the port of entry, shredded and sent back to China as scrap.

Subject: Re: Compression Drivers
Posted by mantha3 on Wed, 17 Oct 2012 18:28:15 GMT
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It looks like this new Dayton driver is a copy of the older B&C 250 driver lineup

B&C used to carry two versions of the 250... One in a Titanium diaphragm and one in a polyimide diaphragm.

I wonder if the old B&C lineup is what was used by Dayton to build these two versions around... The new Dayton driver here has two versions like the old B&C in a Titanium diaphragm and one in a polyimide diaphragm

Subject: Re: Compression Drivers
Posted by blvdre on Thu, 18 Oct 2012 23:13:45 GMT
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Believe me, I can relate to the desire for affordable drivers. But in the case of a specific driver being copied and sold cheaply, there is a downside. The eventual result of this dynamic is that R&D goes away (being driven out of business), and with it, product innovation.

Of course, that's the extreme. After all, in this example, we're only talking about one specific driver. But every little bit counts.

The other very real issue is quality control. All things may appear equal, but there may be hidden surprises in those inexpensive drivers.

Subject: Re: Compression Drivers
Posted by Matts on Fri, 09 Nov 2012 04:23:06 GMT
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I think it's too bad if PE takes market away from B&C with these products. In my opinion, B&C really hit a home run with the DE250, and when I first tried it I liked it better than the JBL driver, with no regard to cost. Just sounded a little smoother and more natural to my ear. They deserve

to make a profit on it, especially since they offered it for a bargain price, compared to the other drivers it competed with. I'd like them to spend some of the profits as a reward for a good job, then plow a little back into R&D to make the next great advance that we'll all be looking for in the future. I don't believe the copycats of the world are going to move us forward the way the real designers do.

Subject: Re: Compression Drivers
Posted by zheka on Sat, 10 Nov 2012 20:43:22 GMT
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Wayne,

Have you noticed any changes in authentic DE250s recently?

Geddes spotted the change early this year and found it significant enough that he had to modify the crossover.

Subject: Re: Compression Drivers
Posted by GRBoomer on Sun, 11 Nov 2012 02:31:49 GMT
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Well with B&C having problem getting product to market, it only hurts them more. The DE250's delivery just slipped another month until mid December. LoudspeakerPlus and PartsExpress and I assume everyone else cannot get any inventory.

I was going to go B&C for some of the reasons above. Now, I am forced to find alternatives. 4Pis need to be up in running in my movie room by Thanksgiving.

Subject: Re: Compression Drivers
Posted by Wayne Parham on Sun, 11 Nov 2012 04:53:21 GMT
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zheka wrote on Sat, 10 November 2012 14:43Have you noticed any changes in authentic DE250s recently?
No, I have not. And as you are aware, I gave them a pretty thorough run of measurements when I tested the H290C waveguide. They act exactly like they always have, at least since I started using them.

In fact, look at the current spec sheet from B&C:
B&C DE250 DatasheetSame as it ever was.

Some characteristics of compression drivers are pretty stable and consistent, but others aren't. Part of a good design is making the crossover tolerate shifts that are most likely. Because they will shift, actually quite a bit, in some respects. That's normal.

The front chamber size and phase plug slots are usually pretty consistent from unit-to-unit. So you can count on the acoustic reactance from those features to stay constant. Alnico magnets may (permanently) lose strength when run hard, but ceramic and neodymium magnets are resistant to demagnetization. So (BL) motor strength is pretty stable in ceramic and neo motors, less so in alnico. Diaphragms can deform when pressed hard, and sometimes their environment can affect them too. Things like sunlight and humidity sometimes affect them. But in general, you can expect the diaphragms to be pretty consistent unless they are damaged. But the one thing that is all over the map is the voice coil. It will change drastically at different drive levels - even seemingly small drive level changes - and this changes motor strength and electrical damping. Lots of non-linear properties shift as well.
Large Signal Performance of Tweeters
Maximum Efficiency of Compression DriversI think the real problem is Geddes crossovers are too sensitive to driver parameter shifts and unit-to-unit variations. This is a common problem, one that I've seen in both DIY and commercial speakers. Some system designs are just more sensitive than others, and in my opinion, one of the most important features of a good design is its tolerance of parameter shifts.

Geddes may use tank circuits in his crossover for impedance/response shaping. He's not alone, I've seen it done by other manufacturers and DIYers as well. It is a fairly common approach, but ill-advised, in my opinion. That kind of crossover design is way too sensitive to changes in drivers, both from unit-to-unit variation and even from shifts due to temperature change at various power levels.

It is described in my Speaker Crossover document as a "resonating damper for the tweeter circuit" and is used as a way to mitigate peaks in impedance, which often show up as aberrations in response. As I said above, the problem with this approach is it is fairly sensitive to driver parameter shifts, and that's why I don't do it in my crossover. Variations between driver units make them hard to match with the crossover. Even temperature changes in the voice coil (which happen as drive voltage changes) will move the peaks enough that the tank circuits do not match.

Probably the greatest strength of my crossover is having that R1/R2/C1 network do all the work. It provides specific damping, and that approach is more tolerant of driver shifts than using tank circuits. Of course, it helps when the horn/waveguide is built properly, and doesn't have resonant modes in the passband.

Subject: Re: Compression Drivers
Posted by zheka on Sun, 11 Nov 2012 12:40:46 GMT
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Great!

Thank you, Wayne.

Subject: Re: Compression Drivers
Posted by skywave-rider on Sun, 11 Nov 2012 22:45:22 GMT
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Wayne Parham wrote on Sat, 10 November 2012 22:53...Of course, it helps when the horn/waveguide is built properly, and doesn't have resonant modes in the passband.
Do some manufacturers use tank filters to notch resonant modes because the waveguides they use cause peaks?

Subject: Re: Compression Drivers
Posted by Wayne Parham on Mon, 12 Nov 2012 07:17:51 GMT
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I see tank circuits in a variety of loudspeakers, but I see them most often used with CD horns and waveguides. Conical horns are usually peaky if truncated at all, and all CD horns and waveguides share a common heritage with conical horns. So it is natural to conjugate these peaks with (notch filter) tank circuits. The problem is as driver characteristics change, either from unit-to-unit variation or even from thermal drift, the tank circuit required would need to change too. That's why I prefer resistive dampers to reactive dampers (notch filters) in this case.

There are a lot of horn/waveguide products on the market that are highly reactive in their passbands. An example of a horn like this is the SEOS12. It is more a curved baffle than a horn, pretty much just a dimple on the baffle. At 3.5" long, it's barely long enough to even hit the primary resonant mode at its ~1kHz crossover point. So it provides very little acoustic loading for the first octave and is reactive high into the passband.

A conical horn and most of the waveguide derivatives load the driver poorly, and the ratio of mouth area to depth is all it has to set the load. As with all things, there are competing priorities here. A 90° wall angle sets the depth accordingly, but then to add a secondary flare to combat waistbanding decreases depth or increases mouth size, whichever way you want to look at it. That's why the SEOS horns are so reactive. Lots of other waveguides suffer this problem too, to tell the truth.

Conventional wisdom says larger mouths smooth ripple, but this is only true when the mouth is undersized. One can go too far with this, and actually make the mouth too large. That will increase ripple too. A horn is reactive not only when the mouth is too small, but also if it is too short. The former problem is usually the case with basshorns, because mouth area requirements are prohibitively large. But the latter problem is sometimes seen in tweeters, especially in the newer waveguides that may not have been analyzed for acoustic loading.

In any case, I personally find it better to not try and chase down a horn with peaks using tank circuits. It's like trying to push an air balloon under water with a pole. I much prefer the R1/R2/C1 method, which I developed after years of working with these kinds of speakers. The speaker document I referenced above was sort of a treatise on the various strategies I had used over the years, and it sort of builds up to the solution I use today.

Subject: Re: Compression Drivers
Posted by tom-m on Mon, 12 Nov 2012 15:14:01 GMT
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GRBoomer wrote on Sat, 10 November 2012 20:31
Well with B&C having problem getting product to market, it only hurts them more. The DE250's delivery just slipped another month until mid December. LoudspeakerPlus and PartsExpress and I assume everyone else cannot get any inventory.

I was going to go B&C for some of the reasons above. Now, I am forced to find alternatives. 4Pis need to be up in running in my movie room by Thanksgiving.
Just my opinion, but I think a Radian would be a good replacement in this situation.

Subject: Re: Compression Drivers
Posted by rkeman on Mon, 12 Nov 2012 16:13:19 GMT
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Supply problems are commonplace in the electronics industry and have been for some time. The Far East appears to be having economic problems much more severe than has been generally recognized in the West and many parts for speakers and electronics are now available exclusively from Chinese or other Asian manufacturers. The bad news is that the situation could worsen if the transition of political power in China does not go smoothly, the dollar declines further or the European economy continues to slide.

On the good news front, Eminence is clearly able to keep up with demand and is far less dependent on outside suppliers and off-shore production than most driver manufacturers. Acoustic Elegance also seems to be catching up on their backlog of orders and is on a surer business footing. The AE TD12S that I received a few weeks ago measures exactly like the others I have used and sounds great!

Subject: Re: Compression Drivers

Posted by skywave-rider on Mon, 12 Nov 2012 16:31:24 GMT
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rkeman,
The TD12S you received, was it purchased through the group buy? I am still waiting for those myself.

Subject: Re: Compression Drivers
Posted by rkeman on Mon, 12 Nov 2012 20:18:51 GMT
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My TD12S was actually ordered late in March of this year, well after the group buy closed. It seems as though some of the models have become available before others. I hope yours arrive soon.

Subject: Re: Compression Drivers
Posted by skywave-rider on Mon, 12 Nov 2012 23:20:28 GMT
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I'm glad you got your drivers. I was curious about whether or not you were in the group-buy because there is zero communication from AE regarding the purchase. AE apparently is making the group-buy people, like myself, wait, and new buyers and commercial users get first priority.

Subject: Re: Compression Drivers
Posted by Wayne Parham on Fri, 16 Nov 2012 19:33:31 GMT
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As I understand it, John has 50 group-buy woofers that will be shipping soon from Acoustic Elegance. You might ping him and see if yours is on the list. Hope you get 'em soon!

Subject: Re: Compression Drivers
Posted by Wayne Parham on Mon, 29 Jul 2013 17:22:54 GMT
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Update:

Earlier in this thread, there was some discussion about a supposed change in the B&C DE250 driver. I attributed it to unit-to-unit variations and sensitivity of some crossover topologies to driver parameter shifts.

Some had noticed Earl Geddes claimed the DE250 had been changed, and so his crossover needed to be changed too. B&C indicated there was no change in the driver, and I found none either, at least not recently, not since the mid 2000s.

The reason for the different positions on whether or not the driver had been changed was a consequence of how the drivers were used. That was my assumption, that people using crossovers sensitive to parameter shifts would see variations in drivers more strongly.

Today, Earl and I were having a discussion on a different forum, and he admitted that unit-to-unit driver changes cause him to need to modify the the crossover occasionally. This is how he deals with driver parameter variations. Geddes says he tests each speaker, so he can catch the unit-to-unit shifts.
Parameter shifts that require Geddes to redo his crossoverFor anyone that was confused by Geddes earlier comments, this should serve to clarify that there was no recent change in the DE250 other than what is normally seen as unit-to-unit variation.

Notch filters are very sensitive, as they must match the driver/horn characteristics exactly. Since the driver will change, both from thermal shifts and unit-to-unit variations, the required notch filter must also. Using that approach, one would almost have to make each crossover specific to the driver it was used with, not just different for each model, but actually different for each driver. Even then, it is only right at one power range. Set it for lower power levels, and it is not correct at high volume and vice versa.

The Pi network used in our crossovers is specifically designed to be tolerant of parameter shifts,

Speakers crossover, it is very robust.
Speaker motors and passive crossover filters
Crossover Electronics 101 Seminar Handout
Tweeter circuits for constant directivity horns and waveguides
Crossover configuration
4Pi crossover study