
Subject: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Mon, 10 Jun 2019 18:59:20 GMT
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Hi Wayne,

Eminence has confirmed that the 4012HO has been discontinued due to lack of demand and there isn't a pair left anywhere in Europe. Can you recommend an alternative to go with the DE250 in the Three Pi?

I don't see another 12" Eminence with shorting rings and the AE TD12Ms are nearly \$1000 a pair shipped to the UK (we have to add 20% VAT to imports) which is a bit much.

I was looking at the Faital PRO 12FH520 which has a similar set of TS parameters (and shorting rings for lower mid-range distortion (it also has a lower LE to start with)) or does it need to have a rising response around 1-2 kHz?

Thanks in advance

File Attachments

1) [12FH520_data_sheet.png](#), downloaded 1542 times

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Tue, 11 Jun 2019 14:05:39 GMT
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The problem is that without a complete test set, usually accompanied by slight crossover changes to adapt the new driver, we cannot really know how well any new driver will perform. So at this time, I cannot suggest an alternative upgrade path.

The 12FH520 looks like a great driver, but its electro-mechanical specs aren't right for this application. I was actually looking at its brother, the 12FH530, which is very similar in most respects. But it isn't right for this application either. So I'm looking at other drivers, including those from B&C, BMS and Faital. I'm leaning towards the B&C 12PLB100 right now.

Stay tuned! 8)

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Wed, 12 Jun 2019 16:41:20 GMT

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Thanks, Wayne, I'll hold off until you've reported back. Do you have a rough timescale? No pressure :)

At the risk of muddying the waters, a couple more I came across that look decent:

Faital Pro 12FH530 - The ferrite version of the 520 which seems to have a more extended midrange

Beyma 12P80NdV2 - no shorting rings but huge 25 BL motor and flat on-axis response out to 3KHz. The V1 had very low published distortion curves.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Wed, 12 Jun 2019 17:11:53 GMT
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I'm looking at offerings from all manufacturers.

My main priorities are to have the right electro-mechanical parameters to maintain the same efficiency and reasonably deep bass response, to have a shorting ring for low distortion and to have a well-damped cone to provide smooth midrange.

The plan is to have a completed design with a new midwoofer offering by the end of the summer.
loudspeaker.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Wed, 12 Jun 2019 18:34:54 GMT
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Fantastic. I'll get the cabinets ready (sans midwoofer cutout).

Subject: Re: Definimax 4012HO - End of Life
Posted by [rkeman](#) on Sun, 16 Jun 2019 01:24:00 GMT
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If a 3Pi redesign is on tap, is it worth considering throwing in the new B&C DE360 ring radiator compression driver for the tweeter section? It looks very interesting and costs less than the DE250.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Sun, 16 Jun 2019 14:59:12 GMT
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Could be!

Subject: Re: Definimax 4012HO - End of Life
Posted by [johnnycamp5](#) on Tue, 18 Jun 2019 19:40:57 GMT
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Wayne Parham wrote on Wed, 12 June 2019 13:11 It will not be a total cabinet redesign - Just a

That would seem better/easier. Could this mean only changing the port size dimensions?

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Tue, 18 Jun 2019 19:54:22 GMT
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now-obsolete Definimax 4012HO.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Fri, 21 Jun 2019 00:15:29 GMT
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B&C 12PLB100 doesn't seem to be widely available. Most dealers are out of stock with one quoting 9-11 week lead time which might suggest EOL, possibly? Only seems to have a front gasket. Rear of baffle mounting only?

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Fri, 21 Jun 2019 21:19:55 GMT
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Mudshark wrote on Thu, 20 June 2019 19:15B&C 12PLB100 doesn't seem to be widely available. Most dealers are out of stock with one quoting 9-11 week lead time which might suggest EOL, possibly? Only seems to have a front gasket. Rear of baffle mounting only?

Could be. I'm not having any trouble finding the driver in stock, but I'll definitely ask about future plans and availability.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Tue, 25 Jun 2019 14:08:07 GMT
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Dear Wayne,
I have built a pair of 3Pi (4012HO + DE250 + H290C). They sound really great in flushmounted condition. It is sad that 4012HO is no longer available.

But this is also an opportunity for big changes. And this is my request (actually, it is my wish):

Add a medium price option: Eminence DELTA PRO 12A
Spec sheet: https://www.eminence.com/pdf/Delta_Pro_12A.pdf
This driver is REALLY good for the money. It is not much expensive than the default Delta 12LFA option. However, the sound is miles better! The mid is really smooth and crystal clear. The bass transient is really fast, dry and much tighter. THD is also really good for the price.

I have tested both Delta 12LFA and Delta Pro 12A, the latter destroyed Delta 12LFA in every single way. Delta Pro 12A can also be tuned to play exceptionally good down to 40Hz.

Please, please add Delta Pro 12A into 3Pi's optional driver list in the plan. This driver is really a gem in 100-200\$ 12" woofer.

Thank you a lot for your hardwork!
Edwards

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Tue, 25 Jun 2019 14:36:43 GMT
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chosen. I chose the Definimax 4012HO because of its shorting ring. My upgrade driver has always been one with a shorting ring. But you're right that the Delta 12 Pro driver could be considered as an upgrade too.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Tue, 25 Jun 2019 15:04:43 GMT
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having an EBS alignment like the other drivers I've chosen. I chose the Definimax 4012HO because of its shorting ring. My upgrade driver has always been one with a shorting ring. But you're right that the Delta 12 Pro driver could be considered as an upgrade too.

Thank you a lot for your consideration. I have tested many Eminence drivers (luckily, I live near a Eminence distributor) and this is my list of best performing 12" EMI woofer:

1. DELTA PRO 12A: Best Bang for Buck. High power handling, really good LF transient and mid reproduction. The frequency response is almost ruler flat for a PA driver.
2. 4012HO: Excellent Performer. Yeah, shorting ring does magic to reduce THD, I love every bits of it. However, now, it is belong to the past. I am happy that I owned 1 pair in my beloved 3Pi.
3. 3012HO: Excellent High Output woofer. It has low THD (if 3rd harmonic is lower, it will be one of the best 12"s ever made) and really smooth frequency response. It also has lighter MMS than 4012HO, together with relatively high BL motor, high Xmax (6.2mm), extremely high sensitivity (>100dB). This is really unique driver. I have succeed with it in my 2x12 bass cabinet. Sadly, it does not have shorting rings. Thus, I think Delta Pro 12A is better mid-priced option because it is much cheaper and also perform really well.

3012HO Measurement

So, as I understand, will we have next 2 woofers in 3Pi Plan's driver list (one is Delta Pro 12A for mid-priced upgrade over Delta 12LFA, the other one is a high-end 12" woofer)?

I can't wait for the day you add Delta Pro 12A into the list. Many friends of mine also like that option a lot because it fits their bill.

And the last question:

How about an upgrade HF driver option with PSD2013 compression driver? BC DE250 is only a little bit higher priced, however, PSD2013 is much easier to grab in many places over the world.

Thank you Wayne.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Tue, 25 Jun 2019 19:01:32 GMT
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You can use the Eminence PSD2013-8 instead of the PSD2002-8 if you want. It's a little more sensitive so use the same crossover configuration as the DE250. I tested it a few years back and found it to be quite satisfactory. We don't offer it as an upgrade option though.

Subject: Re: Definimax 4012HO - End of Life
Posted by [johnnycamp5](#) on Tue, 25 Jun 2019 23:58:26 GMT
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If its a matter of finding an upgraded 12" mid woofer with a shorting ring, I thought the 2206H would have been an early consideration?

If its anything like its big brother....

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Wed, 26 Jun 2019 01:53:35 GMT
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Wayne Parham wrote on Tue, 25 June 2019 14:01 You can use the Eminence PSD2013-8 instead of the PSD2002-8 if you want. It's a little more sensitive so use the same crossover configuration as the DE250. I tested it a few years back and found it to be quite satisfactory. We don't offer it as an upgrade option though.

Thank you very much. I got it. I think Delta Pro 12A + PSD2013 will be extremely good mid-priced 3Pi option for every one.

Ed.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Wed, 26 Jun 2019 08:18:09 GMT
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They're not available in Europe through official distribution AFAIK. US Speaker and Parts Express in the US advertise them at \$450 ea. With shipping and taxes that works out at the equivalent of \$1170/pr imported into the UK compared with \$540/pr for the 4012H when they were last available. US buyers don't have to pay our 20% sales tax (VAT), of course.

The current premium option supported by the crossover is the Acoustic Elegance TD12S which is almost \$1000/pr with shipping and taxes. The hope is to find something better than the entry-level Delta 12 for around the price of the 4012HO give or take \$100 or so.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Tue, 03 Sep 2019 17:07:15 GMT
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Hi Wayne,

Any news on the replacement driver?

Subject: Re: Definimax 4012HO - End of Life

Posted by [Wayne Parham](#) on Tue, 03 Sep 2019 21:02:42 GMT

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I'm not ready to make an announcement, but I can give a status update.

I have a pair of Eminence Delta Pro 12A woofers and a pair of B&C 12PLB100 woofers here to test with.

Both look like they will work very well from modeling and from free-air measurements.

But when I went to install the 12PLB100 into my cabinet to test with a couple weekends ago, I realized it wouldn't fit. So I put off testing for a couple weeks. I had lots of projects going (and still do) so the fail-to-fit problem pushed me to work on something else.

The cabinet I'm using has been routed for flush fit of a driver with 12-3/8" basket diameter, which is what the Eminence drivers have. The 12PLB100 has outside diameter of 12-1/2" so I need to have the cabinet routed to fit.

I could also use another test cabinet I have in storage to test with. So one way or the other, my plans are to test this coming weekend.

I could have tested the Delta Pro 12 first. And I may still do that. But I really want to focus on the B&C driver 'cause it has a shorting ring.

Then again, the Delta Pro 12 will be a great driver too. I think you were right to suggest it, and it was your prompting that made me reconsider it. It will be a lot like the Omega 15A option in the

I am optimistic about both the 12PLB100 and the Delta Pro 12 because they both have the right characteristics. There are three basic requirements over and above the obvious desire for good build quality.

The first and the second are inter-related, being that the electro-mechanical parameters must provide specific sensitivity and EBS alignment in this cabinet. Typically, drivers built with the motor strength and suspension stiffness to get the alignment we're after also provide the sensitivity we need for this kind of speaker. But some drivers don't work in this design, and produce an underdamped curve.

What we need is an EBS alignment that provides extended bass without any peaks, and it dove-tails perfectly with the flanking sub approach. Between baffle step and the cabinet alignment, using the flanking subs act as a 2.5-way system that offers flat amplitude response

with deep bass extension. It also smoothes the self-interference notches and higher-frequency room modes.

So this alignment is a perfect natural mating for flanking subs and multiple subs. But it also sounds great without subs, because even though the response below 100Hz falls off, it is only slight and there is still usable response way down to 30Hz.

In addition to the electro-mechanical properties, we have a requirement of the cone to be well damped, so that it is smooth above 1kHz. Many drivers - even some that are of high quality - do not have cones with sufficient internal damping to prevent cone flex and they get ragged above 650Hz. This can't be determined by electro-mechanical specifications or models, but it can be seen in free-air response measurements, even without the cabinet.

Both drivers satisfy each of these requirements and should prove to sound very good in the three may perform perfectly using the same crossover components as the Definimax did. Or they may require minor changes in component values in the low-pass filter or sometimes just a nudge of the Zobel capacitor.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Wed, 04 Sep 2019 04:11:00 GMT
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Thank you very much for consideration regarding my suggestion with Delta Pro 12A as low cost alternative choice for 3Pi. I am looking forward to hearing from you with appropriate changes in crossover and guidances.

Best regards,
Edward.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Wed, 04 Sep 2019 20:43:03 GMT
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Thanks for the detailed reply, Wayne.

As I was itching to get going, over the summer I built the Three Pi with the Delta 12LFA as a stop gap and whilst it's very nice I can't help feeling that there are further improvements to be had.

It's easy enough to find the centre again for re-routing the rebate (already had to do it once after realising the rebate was slightly too tight after I'd already removed the centre cutout) so I don't mind a larger diameter driver if it has better performance.

Thanks to Symphonimind for suggesting the Delta Pro 12A which I'm sure is an substantial

improvement. I don't mind paying a bit more for the B&C if it's significantly better. If there's any way you can help in quantifying the difference in sound quality between the two to help in making a choice it would be much appreciated.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Thu, 05 Sep 2019 02:55:15 GMT
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Dear Mudshark,
Thank you for sharing your experience with 3Pi Delta12LFA version. Which compression driver did you select? Is it PSD2002?

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mabob](#) on Thu, 05 Sep 2019 11:15:37 GMT
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Hello

Following this one very closely. Both speakers are widely available in Europe and quite inexpensive. Even the B&C which can be a expensive brand, can be found below 200€ here.

This would give me the perfect upgrade path, by using existing Delta 12LFA for flanking subs and moving on to 6Pi cornerhorns in the future.

Thanks Wayne for keeping up the great work!

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Thu, 05 Sep 2019 13:24:58 GMT
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@ Symphonimind:

I'm using the B&C DE250 (£83 (€91) ea in the UK including VAT (\$83 without tax). I always knew I'd want to upgrade the compression driver so I went straight for the top option. The PSD2002 is £62 here so not much of a price difference in the context of a €800 build.

I found the top end to be a little laid back with the default xover options so I'm using 22R/15R for R1/R2 (C1 omitted) which adds a bit more sparkle and gives a flat response through the xover region with a slight rising response starting at 10 kHz which I can't hear anyway as my hearing pretty much stops at 11 kHz.

I found that the H290C waveguide rings like a bell when you hold it by the flange and rap it with

your knuckle so I damped the two larger sides with triangles of 5mm Dedshete and it's now completely inert, so that's my DE250 setup.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Sat, 07 Sep 2019 03:16:28 GMT
[View Forum Message](#) <> [Reply to Message](#)

Mudshark wrote on Thu, 05 September 2019 08:24@ Symphonimind:

I'm using the B&C DE250 (£83 (€91) ea in the UK including VAT (\$83 without tax). I always knew I'd want to upgrade the compression driver so I went straight for the top option. The PSD2002 is £62 here so not much of a price difference in the context of a €800 build.

I found the top end to be a little laid back with the default xover options so I'm using 22R/15R for R1/R2 (C1 omitted) which adds a bit more sparkle and gives a flat response through the xover region with a slight rising response starting at 10 kHz which I can't hear anyway as my hearing pretty much stops at 11 kHz.

I found that the H290C waveguide rings like a bell when you hold it by the flange and rap it with your knuckle so I damped the two larger sides with triangles of 5mm Dedshete and it's now completely inert, so that's my DE250 setup.

Thank you a lot. I will try to damp my existing 3Pi (De250+4012HO) to see if it can make the mid and high smoother.

Edward.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Sat, 07 Sep 2019 14:41:53 GMT
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Mudshark wrote on Wed, 04 September 2019 15:43Thanks to Symphonimind for suggesting the Delta Pro 12A which I'm sure is a substantial improvement. I don't mind paying a bit more for the B&C if it's significantly better. If there's any way you can help in quantifying the difference in sound quality between the two to help in making a choice it would be much appreciated.

See the following link:

Magnet structures

This shows what shorting rings do and what you can expect from them.

Mudshark wrote on Thu, 05 September 2019 08:24I found that the H290C waveguide rings like a bell when you hold it by the flange and rap it with your knuckle so I damped the two larger sides with triangles of 5mm Dedshete and it's now completely inert, so that's my DE250 setup.

Of course there is never any harm covering the waveguide with damping material, but the bell mode of the H290C is well below the passband of the device, being approximately 420Hz. And the amplitude is very low when the waveguide is mounted in the cabinet.

It's kind of like standing waves in a small subwoofer cabinet - They line up at high frequencies, above those which are presented to the cabinet. So but it never hurts to add fiberglass insulation inside a subwoofer and it also sure can't hurt to cover a waveguide with plumbers putty or other damping material to reduce the bell mode even lower than it already is.

Unmounted H290C 420Hz Bell Mode

What I've found is the amplitude of the 420Hz mode of the H290C drops considerably when it is mounted on the baffle. It sort of sounds like the frequency drops too, because it sounds so muffled. But in fact, the frequency is about the same. Mounted or unmounted, the bell mode is approximately 420Hz. But the amplitude drops considerably when mounted.

So the excitation frequencies are over an octave above the bell mode. Of course, it "lives" in the same cabinet as the midwoofer, which does generate 420Hz signals. So it is good that the bell mode amplitude is low when mounted. And I don't see any anomalies in the loudspeaker's response chart around 420Hz, so the bell mode is undetectable and inaudible. But your damping material will decrease bell mode amplitude even further.

Subject: Re: Definimax 4012HO - End of Life

Posted by [Wayne Parham](#) on Sat, 07 Sep 2019 22:15:39 GMT

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I spent a few hours today evaluating the Delta Pro 12 and found it to be a good drop-in candidate. So those of you that were interested in this driver - You can pull the trigger.

I was going to measure the 12PLB100 first, but the interest here for the Delta Pro 12 pushed me to measure it first. That and the fact that I didn't have to run the router to get it to fit.

The frequency response looks almost exactly like the Definimax 4012HO using the same crossover components. The Delta Pro 12 almost looks like it is a Definimax minus the shorting ring. The cones are a little different, but response is smooth between 600Hz and 1.2kHz, so the cone is well damped. The basket is the same and the magnet looks the same from the outside, although it's different internally. Still, all-in-all, I'd say the Delta Pro 12 is very much like a Definimax 4012HO sans Faraday ring. So for those that are wanting the Delta Pro 12, use the crossover components shown on the schematic for the Definimax.

I used the ICD in the WTPro system to evaluate the driver with various crossover topologies. Then I ran it with the same physical crossover used for the Definimax 4012HO. The main thing I was looking for was clean on-axis response and vertical nulls in the right positions, which are approximately $\pm 25^\circ$. In those respects, the Delta Pro 12 looks almost exactly like the Definimax 4012HO.

You can see what I was looking for in the thread called "Crossover optimization for DI-matched two-way speakers." There's a link to a video in that thread that shows the exact process I was doing today.

I'll do the same thing tomorrow to learn if the 12PLB100 will work, and if so, what crossover components it will need. Then I'll modify the crossover schematic to list the new drivers and the crossover components required. I'll post here when I do, so stay tuned.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Sat, 07 Sep 2019 22:39:36 GMT
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Thanks, Wayne, you anticipated my next question.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Sat, 07 Sep 2019 22:48:08 GMT
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Excellent!

I'm excited about these new driver choices. They give people the kind of good quality choices that are what this loudspeaker design really needs.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Sat, 07 Sep 2019 22:59:23 GMT
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That's fantastic, thank you. I know that WTPro can predict THD and IMD. Any chance of posting comparative curves, please? The JBL paper you linked to suggests that drivers with shorting rings can reduce the 2nd harmonic by up to 15dB compared to drivers without which is not to be sniffed at, particularly if it can help improve some of the midrange incoherence I'm hearing with the Delta 12LFA.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Sun, 08 Sep 2019 22:55:14 GMT
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I've measured the 12PLB100 driver and it works well too. Same deal: It needs the same crossover components as the Definimax 4012HO and the Delta Pro 12. Response from any of those three is similar, with vertical nulls in the same locations.

I'll be adding the Delta Pro 12 and the B&C 12PLB100 drivers as options in the next few days, as well as modifying the schematic to include those drivers in the notes.

Here are the distortion measurements, taken with an 8.9v (10 watt) drive signal:

Fundamental 2nd 3rd 4th 5th 6th

B&C 12PLB100

100Hz	0.50%	0.72%	0.25%	0.04%	0.02%
200Hz	0.78%	0.51%	0.12%	0.02%	0.01%
400Hz	0.79%	0.45%	0.07%	0.01%	0.01%

Eminence Definimax 4012HO

100Hz	0.95%	0.77%	0.34%	0.03%	0.05%
200Hz	0.82%	0.67%	0.32%	0.04%	0.03%
400Hz	0.75%	0.53%	0.26%	0.03%	0.02%

Eminence Delta Pro 12

100Hz	2.12%	2.23%	1.63%	0.44%	0.16%
200Hz	2.37%	2.56%	1.33%	0.31%	0.18%
400Hz	2.54%	2.34%	1.12%	0.38%	0.14%

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mudshark](#) on Mon, 09 Sep 2019 15:30:25 GMT
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Thanks, Wayne, great job and proves the efficacy of shorting rings as described in the JBL paper in reducing 2nd harmonic just leaving a bit of 3rd to worry about (or not).

If anyone wants the last two 12PLB100 on the shelf IN THE WORLD grab em now from Parts Express. I've spoken to B&C today who confirm that the driver is still in production but no-one else in Europe or the US that I can find with a search engine apart from PE carries stock. Perhaps someone can correct me.

B&C are going to get back to me tomorrow if they've been able to find any otherwise a UK disty has offered to order a pair with a 5-7 week lead time.

12PLB100 may not be the best choice from an availability perspective going forward.

Subject: Re: Definimax 4012HO - End of Life

Posted by [Wayne Parham](#) on Mon, 09 Sep 2019 16:20:26 GMT

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As you said, the 12PLB100 is still in production, but they're slow-to-stock. It kind of reminds me of the JBL 2226H a couple of years back, when they moved production from the California plant. For about a year, new 2226H woofers were unobtainium. Glad they're readily available again, though not cheap.

Subject: Re: Definimax 4012HO - End of Life

Posted by [Symphonimind](#) on Fri, 27 Sep 2019 13:06:27 GMT

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Dear Wayne,

Today I see your update on driver selection for 3pi on the website. I am glad that 3Pi is alive again with even better options.

Is there any change in passive crossover network for different drivers and driver combinations?

Thank you very much.

Edward.

Subject: Re: Definimax 4012HO - End of Life

Posted by [Wayne Parham](#) on Fri, 27 Sep 2019 14:22:18 GMT

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There are different components used for some drivers. For example, the PSD2002 uses different R1/R2 values than the DE250. The Delta 12LF uses a different capacitor in location C4 than the other midwoofers. But there are no major changes required for the new drivers. The Delta Pro 12 and the 12PLB100 use the same crossover components as the Definimax 4012HO.

Subject: Re: Definimax 4012HO - End of Life

Posted by [Symphonimind](#) on Fri, 27 Sep 2019 15:26:18 GMT

Wayne Parham wrote on Fri, 27 September 2019 09:22 There are different components used for some drivers. For example, the PSD2002 uses different R1/R2 values than the DE250. The Delta 12LF uses a different capacitor in location C4 than the other midwoofers. But there are no major changes required for the new drivers. The Delta Pro 12 and the 12PLB100 use the same crossover components as the Definimax 4012HO.

Thank you very much!

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mabob](#) on Mon, 07 Oct 2019 13:01:07 GMT
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Checking in to see if anyone have upgraded or built new 3Pi:s with either the B&C 12PLB100 or Delta Pro 12A?

As @Mudshark said, the B&C availability isn't very good. Blue Aran in the UK seem to have 2pcs coming in the middle of this month.

I'm about to pull the trigger on Delta Pros. Still a bit unsure if these will give me a significant update compared to the 12LFA? I feel that there's quite a bit low end output and kick missing.

I read what @Symphonimind wrote earlier.
"I have tested both Delta 12LFA and Delta Pro 12A, the latter destroyed Delta 12LFA in every single way. Delta Pro 12A can also be tuned to play exceptionally good down to 40Hz."

Any thoughts on difference in bass output between these two drivers?

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Mon, 07 Oct 2019 14:07:08 GMT
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Mabob wrote on Mon, 07 October 2019 08:01 I'm about to pull the trigger on Delta Pros. Still a bit unsure if these will give me a significant update compared to the 12LFA? I feel that there's quite a bit low end output and kick missing.

Do not forget that this design almost requires flanking subs for deep bass response. You can consider it to be a three-way design with the woofers detached.

They are adequate without subs, but certainly not optimal. They get better bass extension and

even smoother lower midrange response by adding flanking subs. This approach provides baffle step compensation and SBIR/modal smoothing in addition to deep bass extension.

be used with them.

Room modes, multisubs and flanking subs

Helper Woofer Location

Flanking Subs vs Helper Woofers

A better way to mitigate baffle step than using BSC

Subject: Re: Definimax 4012HO - End of Life

Posted by [Symphonimind](#) on Wed, 09 Oct 2019 11:20:58 GMT

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Mabob wrote on Mon, 07 October 2019 08:01: Checking in to see if anyone have upgraded or built new 3Pi:s with either the B&C 12PLB100 or Delta Pro 12A?

As @Mudshark said, the B&C availability isn't very good. Blue Aran in the UK seem to have 2pcs coming in the middle of this month.

I'm about to pull the trigger on Delta Pros. Still a bit unsure if these will give me a significant update compared to the 12LFA? I feel that there's quite a bit low end output and kick missing.

I read what @Symphonimind wrote earlier.

"I have tested both Delta 12LFA and Delta Pro 12A, the latter destroyed Delta 12LFA in every single way. Delta Pro 12A can also be tuned to play exceptionally good down to 40Hz."

Any thoughts on difference in bass output between these two drivers?

Hi Mabob,

We have tested Delta Pro 12A and Delta 12LFA in a flushmounted config in a big baffle wall. And clearly bass from Delta Pro12A is much clearer and tighter. Mid is also cleaner with higher clarity. Sensitivity in the mid range is higher.

It sounds like a proper driver with high BL and low mms. Really punchy.

We modeled Delta Pro12A and it can play in a 70-75L box, tuned to 40Hz. With that config, you will have enough bass extension for most music.

Of course, due to limited Xmax, it cant be played loud with that tuning. If I remember correctly, It will run out of Xmax at around 170-200W RMS. But honestly, at that volume level, I will stay out of my room. lol

When we use the mains with sub and crossover point is around 60-100Hz, maxSPL will be much higher.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Mabob](#) on Fri, 11 Oct 2019 16:42:47 GMT
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Thank you Wayne and @Symphonimind!

I've read through the links you added Wayne and it gave me a better understanding of the

I've built one BR sub with a Dayton DCS255-4 10" I needed it to be small and these allow for a pretty small box about 40L box tuned to roughly 30hz. I will hijack and run the signal from speaker binding posts. I'm a bit skeptic about SPL output compared to the 3 Pi, but well see if they can keep up. Cutoff frequency at 150hz maybe? I'm not sure how steep the filter is on the plate amp. Second sub will be built soon and added.

I had a look at the T&S parameters for both 12LFA and Pro 12. I noticed that the LFA can handle more power 500W vs 400W for the Pro. But does this really matter? The Pro is more efficient 99 vs 94db and the lower MMS, does that mean less cone weight to move? What does BL stand for? Many noob questions, and sorry for hijacking the thread, this should probably be moved elsewhere.

The plan at the moment is to add a second flanking sub, upgrade to Delta Pro and move on to 6Pi from there. More work than going straight to 6Pi, but also way more fun and opportunity to learn.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Fri, 11 Oct 2019 18:16:47 GMT
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Check out this document from Eminence's website:
Understanding Loudspeaker Data
It shows what each of the electro-mechanical parameters describe.

As for flanking sub setup, generally, we want 100Hz, second-order. I've found some combinations that aren't exactly that, but this transfer function seems to work best. The relatively gentle slope from a second-order filter leaves a lot of energy in the 100Hz to 200Hz octave, and it rolls off smoothly, roughly conjugating baffle step.

What we're trying to do is to blend each main speaker with the sub that's flanking it through the

upper modal region, generally from about 60Hz to 150Hz or so. Blending lower is fine, actually desirable, but below 60Hz we get more benefit from distant distributed multisubs. The content below 60Hz from flanking subs is useful for extension, but doesn't help much with modal smoothing. Again, modal smoothing below 60Hz is achieved by distributed multisubs.

Baffle step occurs in the same 100Hz to 200Hz region for speakers this size so we want energy to fill-in the region below baffle step both for overall on-axis amplitude response and also for SBIR and modal smoothing.

Above 150Hz, we start to become localizable. That's not a hard-fixed number; I actually like to see the energy trickle off slowly between 150Hz and 200Hz somewhere. But we just can't run the flanking subs too high. I've found that 100Hz second-order is the "Goldilocks filter" for flanking subs.

I've actually found some amps with built-in bass and treble controls that can be adjusted for a pretty good flanking sub curve. You just turn the treble all the way down and turn the bass all the way up, and the resulting transfer function works nicely for flanking subs. It's a happy accident, I suppose. Level-set the amplitude of the subs to match the mains and you're done.

One example is the Audiosource AMP100VS. It's just a 50 watt amp, but that works well for people that have 10 watt SET amps for their mains. There are probably many other products of this type. If an amplifier has built-in tone controls that use second-order filters, and if the bass adjustment frequency is 100Hz or so, then the amp will work very well for flanking subs.

I've attached the spec sheet for this little amp. See the link below. You'll notice it lists the bass control as being a second-order 100Hz filter. That's what we want. Nice that the bass and treble controls are on the back too, 'cause that way it's out of sight. They're just set to make it a flanking sub amp.

Look for amplifiers like that.

When searching for amplifiers for your flanking subs, you can always try out a product and send it back if it doesn't blend well. Just open the box carefully and keep all the packing material so you can repackage it properly if it doesn't serve your purpose.

File Attachments

1) [AMP100VS.pdf](#), downloaded 627 times

Subject: Re: Definimax 4012HO - End of Life
Posted by [paulp1960](#) on Sun, 13 Oct 2019 15:16:20 GMT
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Hi Wayne,

I'm itching to build the 3 Pi speakers. How do you rate the B&C PLB100 compared to the other offerings including the Definimax 4012HO ? I assume you have done listening tests?

Also can I have the 3 Pi plans please?

One more question, I don't think I will use an amp greater than 200 watts per channel. Do the upgraded xover inductors help with power handling?

Thanks in advance

Paul.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Mon, 14 Oct 2019 16:08:25 GMT
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You've got mail!

The standard crossover will work just fine with 200 watts. It doesn't need larger coils to handle that level of power.

Ironically, most people that buy the larger coils do so because they are using low-power SET amplifiers with relatively high output impedance, and they want to reduce any additional DCR. But the benefits of lower DCR can be beneficial in high-power circuits too. It sure doesn't hurt.

As for listening, I must admit that I spent most of my time making measurements and only listened for maybe an hour. I can tell that the drivers are very good, but I haven't done the next thing that I like to do, which is to live with them for a while.

I have found that after all measurements are done and a design is "dialed-in," I like to live with it for quite some time. It's not enough for me to just listen to a song or three. That's important, sure, and that's the part I've done. I've listened to the songs that are sort of litmus tests for me, the songs with nuances I especially want to hear. Like listening for the double bass note in "I've Seen All Good People" by Yes. Or listening for throatiness in male vocals and breakup in wind instruments. Michael Buble and Chris Botti are good for those. In each of those kinds of listening tests, the new drivers sound great. No throatiness, no midrange breakup and clean distinct bass.

But I also like to live with a speaker for months and see how it sounds over time. I listen for the occasional odd sound that I never heard before. I listen for breakups or screeches. I listen for anything unusual that shouldn't be there. Sometimes, I find those after a long time. Not very often these days, and not with the larger manufacturers that have good quality control. But I have run into that from time to time, especially from low-production run companies. I've also seen unit-to-unit variations from smaller shops, but again, not from the companies we're working with here, which are JBL, Eminence and B&C.

One other thing I learn only after an extended period of time is the level of listening fatigue. Most

of us have been to a concert that was so loud we noticed we had temporary tinnits after we left. But I think few of us have experienced the same thing from exposure to a lower volume level from a longer period of time. This is something I've learned, and I first found it after a three-day trade show.

What I found is that speakers without shorting rings often sound great to me for an hour or two. I can't tell the difference between the speaker with a shorting ring and another similar driver without the shorting ring. I can measure the lower distortion, but when listening at one or two watts, I just can't hear it.

But when I listen to the speaker all day long for three days - like I do at a trade show - I find that I get temporary tinnitus after the show from the speaker without a shorting ring, even if I've always listened at a moderate one or two watts the whole time. So I found that listening fatigue wasn't just from high power levels, it was a function of time and SPL.

I'm not sure that the 2226 really sounds clearer to me. I may think it sounds cleaner, but that might be the psycho-acoustics of my knowing that it measures better, having lower distortion. The truth is that at one-watt, both have such low distortion that it's inaudible, and both sound great.

leave the show, I don't really want to play the radio going home. I have listening fatigue and I need a break for a day.

I don't get this listening fatigue from the JBL 2226. I also don't get it from the Eminence Definimax and played music on the trip home.

So those are some of the kinds of things I don't know about the new midwoofers yet. I'll only know over the course of time.

Subject: Re: Definimax 4012HO - End of Life
Posted by [paulp1960](#) on Tue, 15 Oct 2019 11:33:11 GMT
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Many thanks for the detailed reply Wayne. I will get around to ordering crossovers and waveguides from you soon.

Regards,

Paul

Subject: Re: Definimax 4012HO - End of Life

Posted by [Symphonimind](#) on Thu, 12 Dec 2019 10:35:40 GMT

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Dear Mr. Wayne,

Could you please send me the updated plan for 3Pi speakers? I have the old plan already, however, I just want to have updated version of the plan in case I want to build a new high-end 3Pi for convenience.

Thank you very much.

Edwards.

Subject: Re: Definimax 4012HO - End of Life

Posted by [Wayne Parham](#) on Thu, 12 Dec 2019 15:30:07 GMT

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Subject: Re: Definimax 4012HO - End of Life

Posted by [Symphonimind](#) on Fri, 13 Dec 2019 06:39:40 GMT

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Wayne Parham wrote on Thu, 12 December 2019 09:30You've got mail!

Thank you very much.

Subject: Re: Definimax 4012HO - End of Life

Posted by [Symphonimind](#) on Fri, 20 Dec 2019 06:23:20 GMT

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Wayne Parham wrote on Thu, 12 December 2019 09:30You've got mail!

Dear Wayne, currently I have a pair of 3012HO. I have looked at frequency response, T/S params and everything else, the 3012HO and Delta Pro 12A are almost exactly the same. They are too similar to each other.

Could I just put it to use with PSD2013 (I also have a pair here) with 3Pi's crossover and H290C?

What is the basic electrical slopes of 3Pi's XO? I want to try an active version of 3Pi as an

opportunity to learn from you.

Thank you

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Fri, 20 Dec 2019 15:09:57 GMT
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Sorry, but I do not recommend the Eminence 3012HO driver in this design.

For more information on the crossover design, please see the Pi Speakers FAQ. The "Crossovers" and "Simulations and Measurements" sections have a lot of information about the crossover used in these speakers. The link called "Crossover optimization for DI-matched two-way speakers" shows the specific details on how I develop a crossover.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Fri, 20 Dec 2019 15:16:59 GMT
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Thank you for your advice.

Edwards

Subject: Re: Definimax 4012HO - End of Life
Posted by [DaveFred](#) on Fri, 01 May 2020 14:30:59 GMT
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What about the Beyma 12BR70 as an option?

Thank you,

David.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Fri, 01 May 2020 16:10:28 GMT
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quality/price range as the Beyma 12BR70. The Delta Pro driver would be a good choice for that price point, for example.

When this thread was started, it was prompted by the announced obsolescence of the Eminence loudspeaker. It had a cast frame, well damped cone and flux stabilization. So I was looking for a part that had those advanced features to replace it. I settled on the B&C 12PLB100 for that role.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Mon, 04 May 2020 04:21:44 GMT
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loudspeaker, and a couple of them are in the same quality/price range as the Beyma 12BR70. The Delta Pro driver would be a good choice for that price point, for example.

When this thread was started, it was prompted by the announced obsolescence of the Eminence loudspeaker. It had a cast frame, well damped cone and flux stabilization. So I was looking for a part that had those advanced features to replace it. I settled on the B&C 12PLB100 for that role.

Hi Wayne,

I have just tested the new 3Pi with both 12PLB100 and Delta Pro 12a. As the owner of original 3Pi with 4012 (with DE250), the 12PLB100 is superior in every aspect. Bass is much tighter, the sound is much more clear and focused, THD is really low. I like it very much.

I tried it in a smaller cabinet tuned around 40Hz, the in-room response is well extended into 30Hz region. The sound is phenomenal. However, my stuffing technique is not very good so I got mid leakage peaked around 400Hz and 800Hz, and it ruined the frequency response. Can you share some of your experience on your stuffing technique to get rid of those mid leakage?

The Delta Pro 12A lives up to the reviews. Its bass is tight, the sound is good (but not comparable to B&C in any way). THD is also in the low side. But due to the 4dB higher sensitivity compared to B&C, I have to EQ the system a bit.

Overall, I think that the ending of 4012HO is great. It gives us the chance to upgrade the system to the whole new level and also to have a better option against Delta 12LF.

Thank you very much.

Subject: Re: Definimax 4012HO - End of Life

I agree with you, 100%. Those B&C midwoofers are really nice. It's a wonderful top-notch in the

I also agree with you on the Delta Pro. It's a good driver, and worth the small additional cost over the entry-level midwoofer option. It is also higher in sensitivity, so the R1/R2 values need to be populated specifically for that driver compliment. This makes the overall sensitivity as high as the that option, but when used with flanking subs, the extension isn't needed.

Standing wave modes on larger full-range speakers are always a potential problem, as you've seen in your modded box. My cabinet design efforts were more extensive and difficult as a result.

Smaller cabinets and subwoofers are much easier to design, because standing waves don't line-up in the lower midrange. In smaller boxes, the standing waves shift up into the overtone region where insulation on the walls does a good job damping them. In subs, midrange isn't presented so they can't develop standing waves. But large full-range boxes need a little more tender loving care in the design phase, because they are prone to developing standing waves in the lower midrange where they are difficult to deal with.

What I've done is to model the modal behavior within the loudspeaker cabinets, much like modeling room modes. Several years ago, I purchased license to Martin King's spreadsheets to help analyze internal standing waves. I used them to design my larger model full-range loudspeakers, adjusting the size and shape of the box and setting the position of the midwoofer and the port for minimum standing wave anomalies.

manipulate where I put the driver and port in the box. Sometimes just moving the midwoofer or benefited from adjustment of both cabinet dimensions and driver and port positions.

I am not sure if Martin King is still selling his spreadsheets or not. But you might be able to use the same kinds of tools used to model room modes. The potential problems I see with that approach is the size of the loudspeaker cabinet is small compared to the size of a room, so the tool may not allow the right size chamber to be created. Also, room modes are below 200Hz or so, and we need to analyze the chamber modes over an octave above that.

So if I were going to try to find modal analysis tools to help me look at the cabinet, I would try to find ones that could model chambers down to 2ft3 with each dimension only being a foot to a few feet long. I would also look for tools that could analyze frequencies up to 500Hz. I wouldn't care whether it could go above that, because damping material placed on the walls of the cabinet is able to absorb the sound pretty well at higher frequencies.

What you want to look for is where the "hot spots" are, especially in the 100-500Hz range. We

can't have any in this range in the same location as the midwoofer or the port. If a mode exhibits a pressure maxima where the driver or the port are, it will result in a peak at that frequency.

And finally, you'll find that fiberglass insulation that spans the cross-section does wonders for damping midrange frequencies too low to be damped by insulation attached to the inside walls of the cabinet. That's the trick for damping lower frequencies - Space the insulation away from the walls where it can damp pressure nodes better at those frequencies.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Wed, 06 May 2020 03:58:04 GMT
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Hi mr. Wayne,

I also purchased MJK's MathCAD sheets. I will try to model the cab to find the way to optimize mid leakage.

In my customed cabinet for 3Pi, I totally forgot to implement the stuffing at the mid height of the cab.

After trying 12PLB100 on 3Pi, I cant wait to see a new Woofer option from B&C with 4Pi beside JBL. For B&C, I can quite easily find in my area at the moment. However, JBL driver and especially 2226H is really hard to source locally. And I am not fond of Omega drivers from Eminence. I think that driver line is not really good. For 15inch midbass, Kappalite 3015 is better as a lower priced option, IMO.

The Delta Pro 12A is also great mid priced option. But as our measurement, the crossover needs small modification to match SPL between Delta and CD. In the test box with Delta Pro 12A, I used PSd2013 which has similar sensitivity to BC DE250.

Yesterday, we tested Celestion CDX 1745. It is truly a poorman's DE250. The power compression from 90-98dB/1m is non-existence. THD is really low for 98dB SPL/1m. I did a quick test with LF shelf and 1.2K XO LR4, it came out really good.

The unit to unit variation is really low, at B&C level.
I share with you some of our data so you can consider it. :d

CDX 1745 + H290c/QSC152

Frequency response with H290C and QSC152, unit to unit variation

THD - I forgot that which SPL I measured in this graph, but I am sure that It is around 90-95dB / 1m.

Power Compression test + Test crossover

CDX 1745 THD with XO 1.2K LR4

File Attachments

- 1) [CDX 1745 Power Compression.jpg](#), downloaded 701 times
 - 2) [CDX1745 THD.jpg](#), downloaded 808 times
 - 3) [CDX1745 THD+XO 1.2K LR4.jpg](#), downloaded 786 times
 - 4) [CDX1745.jpg](#), downloaded 806 times
-

Subject: Re: Definimax 4012HO - End of Life

Posted by [Wayne Parham](#) on Wed, 06 May 2020 14:52:15 GMT

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That CDX 1745 is a nice little driver. Looks like it could be considered a drop-in replacement. Honestly, I find that most compression drivers can be used and many have the same voltage sensitivity. For those that don't, a simple R1/R2 switch usually gets the SPL right.

And speaking of that, you're right that the Delta Pro driver has higher voltage sensitivity. We specify the R1/R2 values for that driver to lower the output of the compression driver accordingly.

the updates described in this thread. So any plans that don't show the R1/R2 values required for the Delta Pro driver have an older version of the schematic.

excellent choices, and it's sort of like a Ford vs. Ferrari thing. :)

Subject: Re: Definimax 4012HO - End of Life

Posted by [johnnycamp5](#) on Wed, 06 May 2020 16:30:50 GMT

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Well then I'd have to go with Ford!!

Does that mean the 4 and 7 pi's with the JBL's??

I have the movie "Ford versus Ferrari" and enjoy it very much, but I am a Shelby fan LOL.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Wed, 06 May 2020 16:39:44 GMT
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I love that movie too! One of my best friends is a mechanical engineer, and in the early 1980s, he built a 351 Cleveland with 4bbl heads and a Comp 268 cam. He had a 68 Mustang with that engine and 411 gears in a 9" rear end. Talk about crazy fast. We literally got ticketed for wheelies on the street, I was with him at the time. Amazing!

Subject: Re: Definimax 4012HO - End of Life
Posted by [DaveFred](#) on Wed, 06 May 2020 18:44:26 GMT
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At the risk of beating a dead horse, Did you look at the Faital Pro 12PR3x0 series of woofers?

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Wed, 06 May 2020 21:39:51 GMT
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DaveFred wrote on Wed, 06 May 2020 13:44At the risk of beating a dead horse, Did you look at the Faital Pro 12PR3x0 series of woofers?

We've kinda come full circle. :)

One of the first drivers mentioned on this thread was a Faital driver. We were talking about Faital

I did look at several other Faital models too, including the 12PR300, 12PR310, 12PR320 and 12PR330.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Thu, 07 May 2020 11:49:09 GMT
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Wayne Parham wrote on Wed, 06 May 2020 09:52That CDX 1745 is a nice little driver. Looks like it could be considered a drop-in replacement. Honestly, I find that most compression drivers can be used and many have the same voltage sensitivity. For those that don't, a simple R1/R2 switch usually gets the SPL right.

And speaking of that, you're right that the Delta Pro driver has higher voltage sensitivity. We specify the R1/R2 values for that driver to lower the output of the compression driver accordingly.

the updates described in this thread. So any plans that don't show the R1/R2 values required for the Delta Pro driver have an older version of the schematic.

excellent choices, and it's sort of like a Ford vs. Ferrari thing. :)

Thank you for consideration. I understand your choice. It would be great to audition a top config of 4Pi (which I have never had a chance to listen to).

The CDX 1745 has almost exact same sensitivity and frequency response with DE250. But I think its resonance frequency is a little bit higher. I am really considering CDX 1747 as it it even better performer. Man, that testing task is addictive :d

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Wed, 13 May 2020 02:36:18 GMT
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Wayne Parham wrote on Wed, 06 May 2020 09:52 That CDX 1745 is a nice little driver. Looks like it could be considered a drop-in replacement. Honestly, I find that most compression drivers can be used and many have the same voltage sensitivity. For those that don't, a simple R1/R2 switch usually gets the SPL right.

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the updates described in this thread. So any plans that don't show the R1/R2 values required for the Delta Pro driver have an older version of the schematic.

excellent choices, and it's sort of like a Ford vs. Ferrari thing. :)

Is there a new update R1/R2 values for Delta Pro 12A? Could you please send me the update? Thank you a lot.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Wed, 13 May 2020 16:01:17 GMT
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Oh, yes, I updated the plans right after I finished testing each of the drivers. So I'll send you the latest version of the plans.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Symphonimind](#) on Thu, 14 May 2020 04:33:50 GMT
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Wayne Parham wrote on Wed, 13 May 2020 11:01Oh, yes, I updated the plans right after I finished testing each of the drivers. So I'll send you the latest version of the plans.

Thank you very much. I will try to update my experiment XO with Delta 12+PSD2013.

Yesterday, I tested the CDX-1747 on your waveguide. And the response is so smooth. THD is extremely low. Thank you for creating such a beast of waveguide. Your waveguide is one of the best (if not the best) 12" waveguides I have ever used and measured.

RAW Sound from CDX 1747 + H290C (@1m)

RAW Sound from CDX 1747 + H290C + 2 simple bell filters + LR4 @1.25K

File Attachments

- 1) [CDX H290C + Filters + XO LR4 1.25K.jpg](#), downloaded 986 times
- 2) [CDX H290C.jpg](#), downloaded 860 times

Subject: Re: Definimax 4012HO - End of Life
Posted by [rvsixer](#) on Sat, 25 Jul 2020 16:14:00 GMT
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I have been wanting to build either 6pi mains with 3pi center, or 3pi LCR setup, for a few years now. Have started looking for a new house again, hoping to find one with a room that supports the cornerhorns, but if not 3pi LCR it is.

Wayne's comments here regarding listening fatigue
(https://audioroundtable.com/forum/index.php?t=msg&th=22498&goto=91084&#msg_91084), got me thinking even if I find a space that supports the 6pi's, might one be better off with 3pi's anyhow

due to the better woofers?

I do get listening fatigue on occasion, and my assumption is that distortion in the mids causes the fatigue. If so, how does the 6pi's Delta 10 mid fatigue as compared to a 3pi with one of the shorting ring woofers? Thanks for any input to my curiosity and or incorrect assumptions I have made.

Subject: Re: Definimax 4012HO - End of Life

Posted by [Wayne Parham](#) on Sun, 26 Jul 2020 16:01:35 GMT

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I've not noticed listening fatigue when playing 2226H/Delta10/DE250 cornerhorns for extended periods of time. I took this combination to LSAF 2017, and it sounded great all weekend. I left the show feeling fresh. That's one of my "litmus tests" for listening fatigue. It's a long-term, low-level thing.

We all get temporary tinnitus from high SPL levels, even when exposed just for a few hours. Rock concerts and some industrial work environments are the most obvious ways to get it. Riding a motorcycle without a helmet is too.

But low SPL levels can cause it too, when exposed long enough. And so audio shows became one of my "tests" for this, as you saw in that last post you referenced. I guess I cannot say with certainty that the cause is harmonic distortion, but the only times I've experienced it is when using direct radiating speakers that don't have shorting rings. Even when they are played well below their limits, I found that I experienced listening fatigue after the show.

And the clue in that last statement (for me, at least) was "direct radiating speakers that don't have shorting rings." Since I didn't get fatigue from the cornerhorns with Delta 10 drivers, my hypothesis is the distortion reduction from horn loading prevented listening fatigue. Horns do reduce distortion by approximately 15dB, and that's about the same amount that shorting rings do.

Subject: Re: Definimax 4012HO - End of Life

Posted by [rvsixer](#) on Sun, 26 Jul 2020 18:30:03 GMT

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Wayne, thanks that is very helpful and most interesting info! Looks like both remain viable choices depending on what room I end up with.

IIRC your previous comment on listening fatigue had involved the 2-way designs (3pi, 4pi), and pointed towards shorting ring vs. non-shorting ring woofer being the differentiator. Thus, I did not even think about the horn!

I assume the Delta 10/horn crossover point/topology/other are different enough from the 2-way's

then, to effect the horn loading distortion?

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Mon, 27 Jul 2020 15:24:18 GMT
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Well, there are some similarities and some differences. Naturally, the base crossover is fundamentally different: Two-way versus three-way, different crossover points and slopes, etc. But the tweeter circuit is almost the same in all models. The adjacent crossover is adjusted to match, whether it be a midwoofer for a two-way or the midhorn for the three-way cornerhorn.

Subject: Re: Definimax 4012HO - End of Life
Posted by [rvsixer](#) on Thu, 28 Jan 2021 20:26:49 GMT
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Time for a lockdown project. My 3pi plans are from years ago. Can I get the latest crossover plans that include the newer woofers?
Thanks.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Thu, 28 Jan 2021 21:17:24 GMT
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Subject: Re: Definimax 4012HO - End of Life
Posted by [Scott L2](#) on Mon, 15 Jan 2024 12:48:28 GMT
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Wayne Parham wrote on Wed, 06 May 2020 16:39
DaveFred wrote on Wed, 06 May 2020 13:44At the risk of beating a dead horse, Did you look at the Faital Pro 12PR3x0 series of woofers?
We've kinda come full circle. :)

One of the first drivers mentioned on this thread was a Faital driver. We were talking about Faital

I did look at several other Faital models too, including the 12PR300, 12PR310, 12PR320 and

12PR330.

So, Wayne, please share your findings on the Faital PR3xx series ?

Subject: Re: Definimax 4012HO - End of Life
Posted by [johnnycamp5](#) on Mon, 15 Jan 2024 15:04:45 GMT
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I'm gonna throw in my uneducated guess-
Fs- too high...

I believe the 3pi design was effective at half an octave lower than the 4-pi... not higher,
But Wayne please correct me!

Subject: Re: Definimax 4012HO - End of Life
Posted by [Wayne Parham](#) on Mon, 15 Jan 2024 16:37:18 GMT
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I don't remember specifically what made me pass on the Faital drivers for three Pi model, because I looked at many midwoofers back then.

In many cases, the problem that keeps a driver "off the table" is the basic electro-mechanical stuff. The driver just isn't suited for the box - It's made for a different purpose. While I could re-design for a different box, there's more in play than just the alignment.

The size of the baffle also sets the baffle step characteristics, which play into the flanking sub setup. Once I started using flanking subs, I found that this size cabinet works really well with flanking subs not only because of SBIR/modal mitigation but also by filling-in where the cabinet alignment and baffle-step starts to create drooping response.

Above and beyond the electro-mechanical properties of the midwoofer is its behavior at higher frequencies. Most 12" and 15" midwoofers are great to 500Hz and many are good to 1kHz but the field starts to narrow when trying to find midwoofers that "play nice" above that. We really need clean response to around 1.2kHz for this design.

Subject: Re: Definimax 4012HO - End of Life
Posted by [Scott L2](#) on Mon, 15 Jan 2024 20:03:30 GMT
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Just some ramblings here. Why ? Well, I am snowed in, and what better to do than chat with Mr.

Wayne (?)

1) If I read the 3pi specs correctly, it seems like quite the large box for the 4012HO

2) Coincidentally, I use the Definimax 4012 in my own system. I had NO IDEA they were the preferred driver for the 3pi at one time. It's taken quite some time to squeeze the absolute best out of them (for my needs, at least). I started with the PPSL enclosure, but ultimately decided [that] while the ppsl is great for bass, it's not so great for the upper bass/low midrange. While I always had that "thwack", I missed the sustain/tonal development. I now use 2 drivers per channel; each in its own divided chamber inside a constrained layer damped birch ply box. QB3/staggered tuning. Infra bass(outside units) slide in just under the QB3 tuning.

3) Seems like Eminence is now offering what might be considered the replacement (?) Under the OMEGA name: OMEGA PRO-12-2KW-8 I'm not exactly thrilled with this, as its cone is heavier and the Qms is sky high. All in the name of super-high power handling, I guess.

Happy listening to all !

Subject: Re: Definimax 4012HO - End of Life

Posted by [Wayne Parham](#) on Mon, 15 Jan 2024 21:34:47 GMT

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I loved the Definimax 4012HO. When Eminence introduced it, I gave it a try and immediately found it to be one of my favorites. I hope it gets re-introduced 'cause I thought it was one of Eminence's best 12" drivers.
