

## Emerald Physics CS3 Speakers

By Lorin Elias

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### CS3 Specifications:

System Type: Passive 2-way Dynamic Dipole - DSP equalized

Frequency Range: 32Hz–22kHz -3dB (In room with equalization)

Frequency Linearity: +/- 0.50 dB from 100Hz-20kHz

Impedance: 8 Ohms nominal

Max Power input: 150W RMS, 300W program

Sensitivity: 95dB 1.83V @ 1M @ 1kHz

Drivers: High Freq: 1 inch exit compression driver

Low Freq: 12 inch paper cone coaxial

Crossover: 3rd order acoustic Butterworth filter at 900Hz

Frequency Contour: Digital equalization - Behringer

DCX2496

Standard Finishes: Black Oak

Optional Finishes: Mahogany, Cherry and Maple Veneers

Dimensions: 41"H x 16W x 8"D

Weight: Net: 44 lbs each

Shipping: 120 lbs (Pair in single shipping carton)

MSRP: \$2995 in Black Oak, \$3495 in the other optional finishes

I have a confession to make. For one brief period in my audiophile journey, not so long ago, I stopped reading speaker reviews entirely. I decided that they were boring. After all, most speakers are built quite the same way. You take two or three drivers off the shelf from some major manufacturer in Denmark or China, shove them in a ported wooden box, configure the crossover, and you are in business. Boring. For a speaker review to capture my attention, the design had to be different.



Welcome to the land of different. These Emerald Physics CS3's are so different, I don't even know where to start. The collective list of words that describe them don't apply to any other speaker I know of. Open baffle, dipole, coaxial, DSP room correction.... Sure, individual speakers might exhibit one or even two of these design ideas, but all of them? Combined? Madness!

This curious design topology would seem to be a marketers dream. One can simply provide a grocery list of impressive features, never mind the possibility that they integrate in a synergistic way. The trouble is, us audiophile are a prejudiced lot. Spend some time perusing the audio discussion forums, and you will quickly learn that many veteran audiophiles "don't like panels", or "don't like horns", or ""don't like coaxial drivers", "don't like open baffles", don't like DSP"...and the list goes on. Suddenly, a long list of things that make these speakers different, can quickly make them a challenge to market.

Fortunately, there is an easy solution to this problem. Listening. I have encountered people who are skeptical about the Emerald Physics CS3's...even people who had negative things to say about them. However, none had even heard the speakers! Instead, their opinions were based on previous experiences with open baffle designs, coaxial drivers, DSP, or some other element employed in this very different design. Personally, I had no idea what to expect. Other designs by Clayton Shaw (presumably the "CS" in the model name) of Emerald Physics have been attracting rave reviews here and elsewhere. However, I was still a little skeptical. Higher-end speaker manufacturers often brag about the fancy materials in the drivers (Beryllium, Carbon Fiber) or extravagant construction techniques to control cabinet resonances. The parts list for this pair of speakers is not particularly impressive. The Eminence 12" woofer and Selenium tweeter are both available on-line for well under \$100, and neither part has attracted much attention from the DIY crowd. The Behringer DCX2496 digital crossover and digital EQ processor is also nothing new or particularly special, and readily available for \$300. The CS3's also employ a hardware crossover (hence the need for only 2 channels of

amplification), but I did not actually see this component, and cannot comment on the parts used. Even the enclosures are unremarkable. They aren't really enclosures at all, but rather more like simple integrated stands made out of two slabs of wood. The speaker package (including the essential digital processor) retail for \$2995 USD. So....one the one hand you have people raving about a groundbreaking product that sounds fantastic, and on the other hand, from the parts one can readily see, there does not appear to be anything remarkable here. The markable part isn't in the reading though. It is in the listening.

Let's get some of the compliments out of the way. These speakers soundstage and image better than any I have heard.....ever. I am an imaging freak, and have purchased many of the "imaging champions" of the audiophile world, from mini-monitors like the Totem Model 1 Signature and Proac SC1, to floorstanders like the Gallo Ref 3.1. I have even experimented widely with ESL's (and owned no fewer than 5 pairs of Martin Logans). However, when set up cor-



rectly, these Emerald Physics CS3's present a spatially vivid and accurate picture that is really quite addicting, and easily the best I have heard. The CS3's are the kind of product that you demonstrate to your NON-audiophile friends to show them what they are missing. People who are not obsessed with audio are still quite sensitive to many audiophile virtues, such as clarity, frequency response, and dynamics. However, virtues like imaging and soundstaging often come as a surprise to the uninitiated. This makes a demonstration of the CS3's a real treat, because you can see people's face light up when they hear where the sound is coming from, and the "virtual walls" of the acoustic space from the recording appear to defy the boundaries of the listening space.

It is difficult to describe the tonal character of these CS3's, which is really quite a complement in itself. They are very neutral sounding (they were a bit bright at first, but this attenuated as they broke-in), and the lack of wooden box around the drivers really makes them sound unlike the vast majority of other speakers out there. In fact, they bear a closer resemblance to other boxless speakers, like pan-

els. Unlike panels though, the CS3's offer much of the impact of cone drivers. You still don't get as much slam as you can feel with a large bass-reflex design (such as the 300 lb/pair Ushers that I was comparing them to), but you also get considerably more impact from them than you do from panels. The transparency that the CS3's offer is also reminiscent of panels.

I know some reviewers stick to a relatively stable list of reference tracks when evaluating components, and I certainly try to employ this strategy myself. However, I also find myself drawn to different music depending on the strengths or weaknesses of the component being evaluated. These musical preferences can actually be quite revealing about the component under review. When listening to the CS3's, I was really drawn to what my wife calls "clean music" - acoustic recordings, unamplified, from genres like Folk (Indigo Girls, Eva Cassidy), Country (LyLe Lovett's new album Natural Forces), or Classical (especially choral works, like those by Moreten Lauridsen). Unexpectedly, I also found myself drawn to various examples of electronica, from Imogen Heap to Solar Fields. The more bombastic techno recordings (like selections from Israeli sensation Infected Mushroom) that I tend to enjoy through the big Usher speakers quickly fell to the bottom of my playlist. My "grungier" recordings fell out of rotation entirely, not that the rest of my family minded their absence...

So, to sum up what we know so far, we appear to be getting remarkable sound from a system that actually looks quite unremarkable. How is this possible? As far as I can tell, the real magic here is in the software, not the hardware. An integral part of the system is the Behringer DCX2496 external crossover and DSP correction unit. This sure is sure is a nifty toy, seemingly designed by the same person who worked on the original "Star Wars" arcade game in the 80's. It's an ugly thing, and strange too. Three XLR inputs, and 6 outputs? What? This is clearly not designed for the 2-channel audiophile enthusiast. When initially reading about the CS3 and getting interested in reviewing it, I paid special attention to this component. After all, it is an essential part of the system, and not particularly easy to accommodate. Initially, I thought, "my preamp has XLR inputs and outputs...no problem". In fact, given my balanced DAC (a Bryston DA-1), I thought I could either put the Behringer between the DAC and preamp, or even after the preamp, but before my monoblocks. I tried it both ways, and generally preferred placing it BEFORE the preamp, being fed directly from the DAC. I don't know why (perhaps impedance issues between the preamp and monoblocks), trying to drive the monoblocks directly from the DCX2496 compromised the dynamics and "grip" of the system. However, there was also a downside of placing the crossover/DSP that early in the system. Because I was initially failing to get much bass be-

low 50Hz (this improved as the speakers continued to break in), I wanted to use a subwoofer. However, the crossover/DSP does not let information in the 20hz range though, so if your subwoofer is connected to your preamp, and you place the crossover DSP ahead of the preamp in the signal path, your sub will not be particularly useful.

I had one more problem integrating the crossover/DSP unit. I like to try review components within several systems to get a better sense of "how they get along with others", and especially enjoy seeing if they can jump up or down the food chain effectively. During the review period, I took delivery on a Peachtree Nova integrated amplifier with on-board DAC. It did not have any XLR ins or outs, but I was not worried....I figured I could finally use that new pair of RCA to XLR cables that had been living in my cable drawer. I picked up the cables...then put them back down. This was not going to work. The Behringer DCX2496 needs to get between the source and the preamp, or between the preamp and poweramp. A box containing all three pieces is simply not compatible (with the possible, but still unlikely exception of units with Tape loops). I could have used the Nova with an external DAC, but considering that the piece is best know for its excellent DAC, that would defeat the purpose of the exercise.

Despite my two paragraphs of rambling about the Behringer DCX2496, it is not the box itself that steals the show here. It is the software inside. According to Clayton Shaw, the Emerald Physics settings stored in the unit come from a combination of acoustic measurements in representative rooms and tuning by ear. I could not resist the temptation to peek, and connected the DCS2496 to an older computer I had lying around (you need a serial port to download the settings) and took a look at the EQ curves. I certainly don't want to give away any industry secrets here, and also don't want to give the reader the impression that I understand all the subtleties of this type of measurement and programming, but I can certainly tell you that the EQ settings looked MUCH more complicated than I was expecting. The jagged pattern of peaks and valleys comprises the types of correction that would be practically (if not completely) impossible using a conventional hardware crossover. And that is just the adjustment in the frequency domain. When you start to consider changes in timing and phase, things get even more difficult. These settings are clearly producing the "magic" in this remarkable system. Before this review period, I was skeptical about DSP room correction. Now, I think this technology is the future of high-end home audio. Done properly, as with the Emerald Physics CS3, the results are shockingly good. I'm hooked.



What is the worst thing about these speakers? Their appearance. I don't feel guilty for praising visually spectacular audio equipment for looking great, and yet I always feel guilty for criticizing equipment along the same criteria. Still, these speakers are not particularly fun to look at. In fact, parked next to my big Usher CP-6381's, with their deep black gloss finish and rich, impeccable woodwork, one might not think that the CS3's are even in the same league. To be fair to the designers here, I am not sure how the speakers could be designed to look much better. I actually tried to draw out some rough "cabinet" designs that would look less odd, and failed. When my wife first saw the speakers, she looked at the back of one of them and asked "Is it finished?". "Exactly", I replied. These speakers are not going to be mistaken for something by Shanling, Chord, or Pathos...units that can sell on their looks alone. Soncially though, the CS3's bettered the big award-winning Ushers in several respects. They were much better at imaging and soundstaging, they had more even tonal balance, they were easier to drive (95dB compared to 87dB), and easier to place in a room. They were also much easier to transport up and down the stairs! What do you give up? Well, deep bass and the slam/weight of the signal are the obvious losses here. Sure, you can supplement the deep bass with a subwoofer, but as I articulated earlier, than can be a little tricky given the need to integrate the Behringer DCX2496 into the system. Even if you succeed with that, you still won't achieve the sheer impact that a large bass-reflex design can deliver.

Overall though, I absolutely love these speakers. They image better than anything I have heard (including floorstanders that retail for \$40K), they are relatively easy to drive (95 dB), flexible about placement, and they make most any other speaker sound "lifeless" in comparison. Sure, there are inconveniences here too. The best part about the speakers (the Behringer DCX2496 and its associated settings from Emerald Physics) also happens to be the worst part. Be sure that you seriously consider the practical limitations of this device (and even the system upgrades you

might be considering) before committing to a pair of these. I can only conclude this review with a classic audiophile compliment/criticism that you see in so many classified ads for used Hi-Fi. You know the line...."I liked component X so much, that I immediately upgraded it to model Y from the same company". I feel the same way about these speakers. I am so impressed with the CS3, that I now have my sights set on their top-of-the-line CS2.3's.

### **Manufacturer's Response**

*Thank you for your fine review of our CS-3 open baffle speakers.*

*You have gotten to much of what we have tried to accomplish in the design. It is always nice to be compared so successfully to speakers that sell for as much as \$40,000.00.*

*I would like to make a few points.*

*One of the most important aspects of the design is the pattern control of the new full range coaxial driver in the CS-3 as well as the CS-2.3. It is designed to control the dispersion of the drivers so that we are able to remove the room from about 200Hz and up from the listening equation. This means that the speakers will sound good in any reasonably sized room. We have no bad rooms as long as you can get the speaker 2 feet or more from the rear wall. They can go as close as 6 inches from the side wall as we effectively remove the walls from most initial reflections. This allows the listener to hear the speaker and not the room. When you then deliver amazingly flat and accurate frequency response, along with great dynamics and open baffle, boxless bass you get sonics that rival the live event with no room interactions. This is a major reason that they sound so much like live music and make everything else sound so "lifeless" as the reviewer states.*

*We get loads of interest in the Behringer. It is totally misunderstood yet is one of the major reasons that the speakers sound so good. You just can't do an analog crossover and get the proper EQ that we can in the digital domain. Yes, if we had a \$5000.00 digital crossover it would be better still. However the downside of the Behringer is far outweighed by what we can accomplish as a reasonable price with the speakers. We do have a better, although far more expensive, solution with our new Spatial Computer software based system that takes the speaker to another level. Info on that can be found at [www.spatialcomputer.com](http://www.spatialcomputer.com).*

*For larger rooms, the CS-2.3 (\$4795.00 a pair in black) adds dual 15 inch woofers, our new bass loading technique and true 20Hz bass with amazing dynamics and far more slam. The CS-3 works in room from 2400 cubic feet and down while the CS-2.3 works in rooms from 1600 cubic feet and larger.*

*All new CS-3's will ship with new equalization that allows the user to add a subwoofer thru the Behringer crossover. This allows the system to play even louder with more dynamics and better midrange performance.*

*The speakers are sold Internet Direct and we will gladly take as much time as needed to help users make good associated equipment choices. The Peachtree Audio Nova you wanted to use actually works great with a little 100wpc Jolida power amp and the new smaller Decco2 makes a killer \$1390.00 package with that same Jolida amp. Due to the Behringer and easy driver impedance loads all Emerald Physics speakers work very well with inexpensive associated equipment as well the best electronics.*

*Finally, all new CS-3's will be built in our new California production facility and be upgradable to the same state of the art midrange/tweeter as used in our new flagship, the \$15,000 CS-1.3. This can be done at anytime in the future.*

*Thanks once again for such a wonderful review.*

*Walter Liederman*

*Owner-Emerald Physics*

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### **Associated Equipment:**

Logitech Duet and Philips DVD963SA transports

Bryston BDA-1 DAC, Jungson JA-2 preamp

Xindak XA-8800MNE monoblocks

Usher CP-6381 speakers (modified)

Xindak PC-02 power cords (2), JAS Cu15 power cords (2) Jungson Magic #1 Power Conditioner

Z-squared Au/Au XLR interconnects (2)