

Carrera



Introduction

Every once in a while, someone says to me, "I wish you would do a design using super-high-end drivers." To which I say, "You buying?" Well, sometimes they are!

This project started out because someone handed me what I consider to be two of the finest drivers currently available, and asked me to design a speaker around them. This is what I came up with.

On the surface, the Carrera isn't anything too unusual; an unassuming-looking bookshelf 2-way. Not exactly earth-shattering. But the performance I was able to get out of these drivers definitely goes beyond what I've been able to achieve in the past, and allowed me to really "nail" a sound I always longed for in a 2-way speaker, but never could quite get there.

Sadly, I had to give the speaker back to the owner once the design was complete. But I knew that someday, I would have to rebuild a pair for myself.

Driver Choices

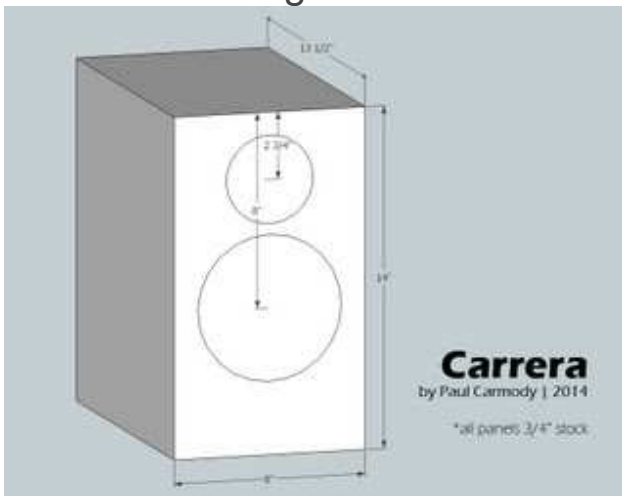
Let's just get this out of the way. In my opinion, the Hqphphon OW tweeters, and the Scan-Speak 5.5" Revelator woofers are two of the best drivers available right now. While I'm sure that other DIYers may put other drivers above these for various reasons, I think most can agree that these two drivers both do certain things very, very well. They are by no means inexpensive, but they are capable of providing a level of performance that I've just never been able to get from lower-end, cheaper drivers. (Nothing against cheap drivers. I LOVE making a cheap driver punch above its price class!)





The Hiquphon OW series tweeters are also exceptional. They have a nice, flat Frequency Response, of course, but there's something else "magical" going on with them that's hard to quantify but easy to qualify. Hiquphons can resolve cymbals better than any other tweeter I've heard. They also have a remarkable tendency to create a wide and deep soundstage, and place instruments and voices within it, and not let them wander.

Enclosure Design



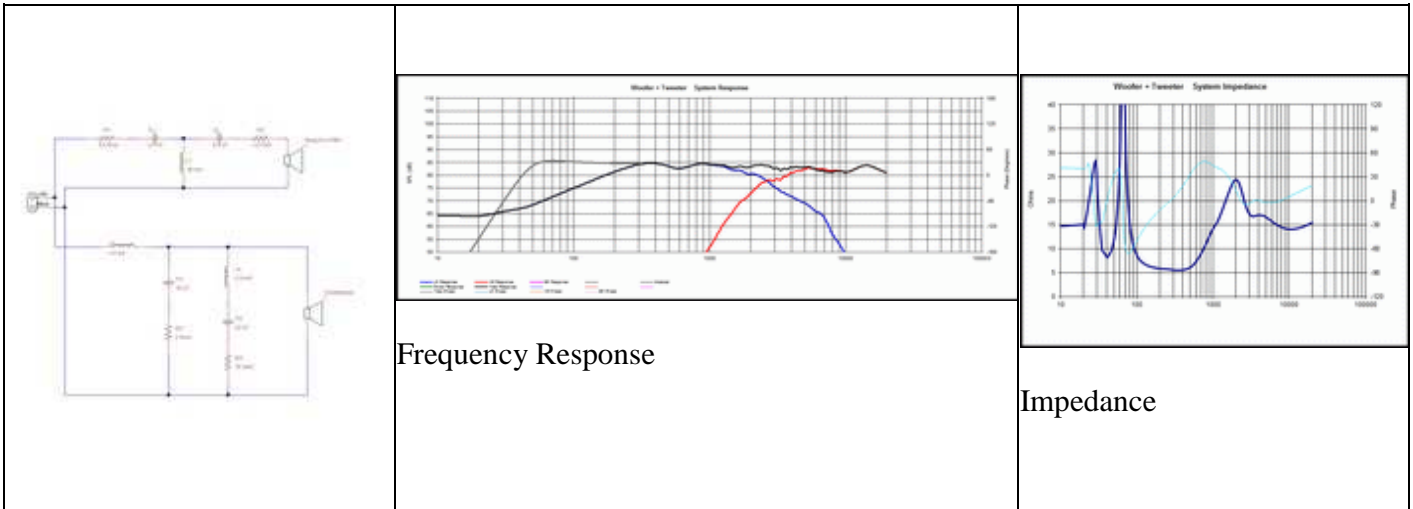
The enclosure for the Carrera is pretty straightforward. It's a bit deeper than your average bookshelf speaker, but that's about the most noteworthy thing to say about it. The enclosure is 15 Liters, and is lined inside with convoluted (eggcrate) foam. The model specifies 3/4" stock all around.

I have mine tuned to 43 Hz, and the bass is delicious. However, there is some leeway in the box tuning, depending on what you like. If you're a purist, and like a flat/gently tapered bass response, then I would suggest using a 2" diameter vent that is 9" long. This will tune the enclosure to approximately 38 Hz. If you like a bit of subtle bump in the low bass (as I do), then you will want a 2" diameter vent that is 7" long. This tunes the enclosure to approximately 43 Hz. Either way, you'll get an F3 around 39 Hz, and Scan-Speak bass at its very best.

The port is mounted on the rear, approximately behind the tweeter.

Crossover Design

The crossover for the Carrera does use a few more parts than my norm. The tweeter filter is 3rd order electrical, with padding resistors on either side to carefully balance the tweeter level. The woofer filter is 2nd order electrical, with the resistor R3 used to adjust the knee slightly. The filter of L3+C4+R4 is used to tame the characteristic peak Scan Speak paper woofers tend to have around 800-900 Hz. In my opinion, this filter makes a worthwhile difference; because having a bump in that range, however slight, can make a speaker sound boxy and cheap, and that's the last thing we want on a \$200+ woofer!



Listening Impressions and Various Commentary

Here they are, in all their glory. The cabinets were built by [jchurch]. They have a burled walnut finish that exudes an "executive cabin" sort of feel. I love it. I'll be keeping these little guys for a long, long time!

As alluded to at the beginning of this writing, the [first version](#) of this speaker was actually designed 3 years ago, when I



did it on commission. The original version used the Hiquphon OWIII, but unfortunately, that tweeter is no longer available. After some convincing by Dave Ellis, I decided to try the OWI for this "updated" version. It wasn't exactly a drop-in for the OWIII--the tweeter filter did have to change a bit. But the net result is now the same: a speaker that does everything I could want in a 2-way bookshelf. As mentioned previously, the bass is deep, if not downright head-turning. The midrange hits that "sweet spot" for me, that lets me listen to all the rock and pop (and even metal) I want to, and never become fatiguing. And the treble has that pinpoint-yet-effortless sound Hiquphons are so good at.

The Carrera could be paired with a sub, which would allow for quite high SPL levels. But I'm a father of two young children; that sort of thing is pretty much a non-issue for me. Instead, these fill a need for me to have

something that can sound great at relatively modest SPL (say, 70-85 dB), comfortable-yet-exciting to listen to for long stretches of time, on a variety of material (both high and low quality). Like a real Carrera, this level of refinement and enjoyment comes at a dear price. Yet, if I had the funds to buy one (the car, that is), I would want to use it as my daily driver; and that is exactly how I feel about these speakers.