“Speedster” by Paul Carmody

A speedster is a car that was meant for one thing: to be fun to drive. It wasn't meant for picking up groceries, or hauling the family around. It wasn't meant for commutes on cold mornings, or city driving across potholes. It was meant to whip around corners and let you feel the wind in your hair and the bugs in your teeth--and look cool doing it. It's a rich boy toy. No one *needs* a roadster, but people buy these things because they're a fun way to forget your problems and focus on the exhilaration of white-knuckled driving, if only for a few hours.

These speakers are like those roadsters, spyders, speedsters, and barchettas. They are meant to be small, cool, and fun to listen to. They're for private listening, and enjoying the music, and leaving your cares someplace else, miles away. They are not the cheapest speakers on the block. but you get what you pay for: a well-engineered woofer with a massive under hung motor, and a true ribbon tweeter. The result is a speaker that provides plenty of detail and dynamics, but in a very small cabinet. Depending on how you finish them, they can disappear into the decor of a room, or be showcased like the little luxury item they are.

This speaker started when I was experimenting with the Fountek NeoCD1.0. It is a true ribbon tweeter (thin aluminum diaphragm, transformer, the works)--but unlike most true ribbons, it doesn't cost a small fortune. Seemed like a good deal, right? So why wasn't anyone using it? Not sure, although whenever it was brought up, people advised only crossing it way up high--like above 5000 Hz. Come on, really? How often do I need to do that? (answer: pretty much never, except maybe if I was using a dome midrange).

Well anyway, when I finally went on my own volition and looked over Fountek's application notes for the tweeter, they actually recommended crossing at 3000 Hz, using only a 2nd order electrical crossover. That's a much more useful application! I played around with this configuration with some random little woofers and found the sound quite nice.

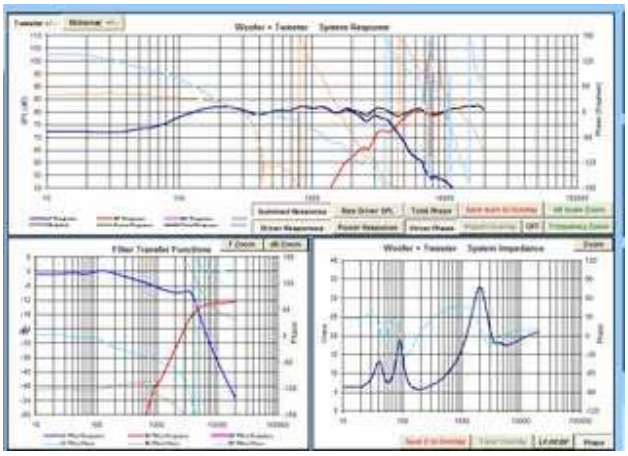
So the hunt was on for a cool mid woofer to pair it with, preferably something around 4". Now, while there are some European mid woofers that could have done this job quite admirably, I was intrigued by Tang Band's new offering, the W4-1720, with its crazy-massive magnet and under hung motor. It was given high praise by Lou C, who had recently used it successfully in a high-quality mini speaker, so I gave it a shot.

This driver is silly. The magnet is ginormous, like the size of a softball; the photos don't do it justice. Because of the huge under hung motor, the driver is very heavy. The cone is smooth-coated paper, and the dust cap is almost flat and bottle cap-shaped. The driver's Frequency Response is well-behaved, akin to that of many higher-priced Scandinavian drivers. The impedance is higher than the 4 Ohms it is advertised as, which allows it to play nicer with a wider range of amplifiers.

Enclosure Design

The enclosure for the Speedster is 5.5 Liters. It has a 1.375" dia port that is 4.5" long (mounted directly behind the tweeter). This tunes the box to about 55 Hz. The -3 dB point of the W4-1720 in this size box is in the mid 40 Hz range, which is quite satisfying (more on that later). The cabinet is constructed with 1/2" MDF, and there is no bracing. Instead of lining the walls, I used a few handfuls of polyfil to lightly fill the box. You can add or remove stuffing to adjust the bass response to your taste. The tweeter is flush-mounted, however the woofer

Crossover Design



The crossover here uses 3rd order electrical filters on the woofer and tweeter. I could have used lower-order filters in this design, however in the end I decided to use higher-order filters in order to shape the drivers' Frequency Responses to my liking. All in all, it's still not a terribly complicated crossover, with 8 components. Note that the tweeter is connected in reverse polarity

The crossover components are all stock parts. I'd suggest polypropylene capacitors and standard wire wound resistors (pick your favorite brand). The inductors on the woofer are all 18 gauge, and the inductor on the tweeter is 20 gauge.

Listening Impressions

Like a high-performance roadster, this speaker is meant to be fun to listen to, and to make you want to keep listening for hours and hours. It's an escape from the stresses of life. One of the most striking things about this speaker is the bass delivered by the Tang Band W4-1720. This driver has some seriously full bass for a small driver. When I brought this speaker to InDIYana 2011, a lot of people were asking where the sub was hidden. The midrange is very pleasant like a paper cone should be, and the ribbon tweeter delivers clear treble, but never gets overly splashy. There are a lot of ribbon fans out there who enjoy their "sparkly," quality, and while I'm not that great at coming up with flowery descriptions of speakers, I could probably agree that this tweeter does have that trademark ribbon sparkle.

The speaker would work on a desk, although I might advise raising it a bit off the surface of the desk to keep bass response in-check. It would also kick ass as a stand-mounted satellite or bookshelf speaker in a small or medium-sized room. As I said about the Overnight Sensations, the big advantage of these type of small speakers is that they can allow for full-sounding listening sessions into the wee hours of the night and won't rattle the walls or wake the neighbors.