

Building the Occam Audio MTM 4 Kit

By Bill Fitzmaurice



PHOTO 1: The Occam Audio MTM 4.

The Occam Audio MTM 4 kit uses two CSS WR 125ST 16Ω shielded 4" mid-basses and a Wavecor TW030WA01 8Ω 30mm soft dome tweeter in a 10 liter aperiodic vented enclosure (Photo 1). Versions are available configured for bookshelf, center channel, and wall mount/surround. I built a pair of the bookshelf models.

ASSEMBLY

The kit, which includes an instructional DVD, is shipped with the parts nested inside the plastic wrapped enclosure. The magnetically attached grille hides four screws that hold the cabinet together. Removing these screws with the enclosed Allen wrench reveals polyester batting and a box of parts (Photo 2). The 1" thick CNC machined MDF enclosure consists



PHOTO 2: Kit parts.

of a rear shell, a spacer that fits between the shell and the baffle, and the baffle.

A variety of finish options range from veneer to paint. The DVD offers tips on finishing, as well as a step-by-step video on the assembly process. Using the DVD instructions, I applied a paper-backed red oak veneer, finished with sprayed-on shellac base coats and clear lacquer top coats. The result is a very attractive speaker with a high WAF. That was very important, because their destination was her den.

Inside the parts box are screws and other hardware, a crossover board, crossover components, lead wires with spade lugs on one end, an input cup, and the aperiodic vent. You can either attach the crossover parts to the board with the supplied plastic ties, or glue them in place with a high temperature hot-melt glue or RTV adhesive. Because the board is not a PC, you directly connect and solder the component leads. When you complete the crossover, mount it via screws and spacers to pre-drilled pilot holes inside the shell (Photo 3).

The crossover input leads attach to the input cup, which you install in a pre-drilled hole on the cabinet back. The cup has push terminals that you can use with bare wire or with a banana plug. The aperiodic vent, consisting of a fiberglass filter and plastic escutcheon, screws

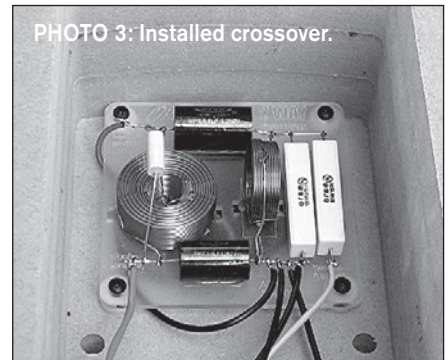


PHOTO 3: Installed crossover.

in place over another pre-drilled hole (Photo 4). You attach the drivers to the baffle, connect the wires, and screw the baffle, spacer, and cabinet shell together again. While purists may leave the grille off, I like the look and the driver protection it offers (Photo 5). Assembly time,



PHOTO 4: Installed input cup and aperiodic vent.



PHOTO 5: Completed cab with grille.

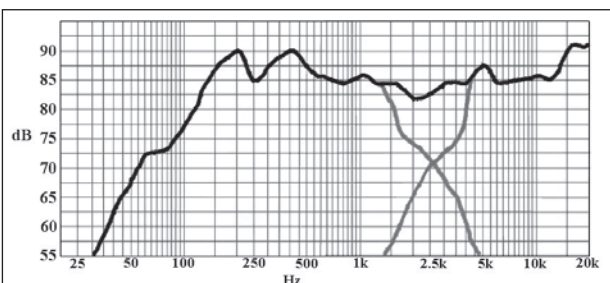


FIGURE 1: SPL 1m/1W.

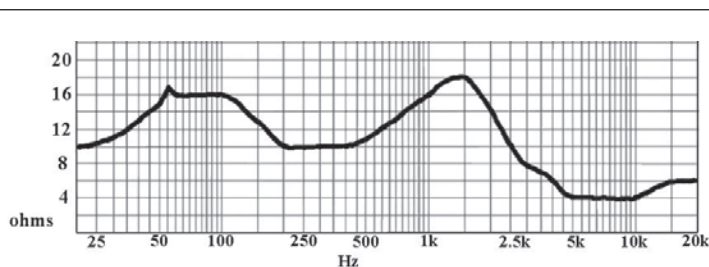


FIGURE 2: Impedance.

exclusive of applying the finish, is less than an hour.

This is an ideal kit for the first-time builder or for those with no access to a shop, because there is no woodworking required. The only reservation you might have is that there is no provision for sealing the mid-bass drivers to the baffle, or sealing the joints between the cabinet parts. Of course, that's easily addressed with some sealing caulk should you choose to do so. Because the aperiodic alignment acts as a lossy sealed box anyway, I doubt that sealing everything airtight would significantly affect performance.

PERFORMANCE REVIEW

The 16 Ω CSS WR 125ST manufacturer's recommendation is a 7 liter bass reflex alignment, with a nominal f_3 of 90Hz. A pair of them in the 10 liter Occam has an f_3 closer to 140Hz (Fig. 1). The impedance of the aperiodic alignment is unusual (Fig. 2), lacking a low frequency peak. It's possible that the generous amount of cabinet stuffing is responsible for this.

The lack of any mid-bass boom indicates a moderate Q , also the product of a well-damped enclosure. As a result of the rather high f_3 , this isn't a cab that you'd want to use for high output HT mains, but with the limited output capabilities of a pair of 4" drivers that's not a use you should be considering anyway.

Where the fours really shine is in off-axis response (Fig. 3). Measured at 30° off-axis, their response is essentially the same as on-axis to 900Hz, and never drops by more than 2dB above that. The neo magnet Wavecor tweeter does very well up to 10kHz, above that dropping to a still respectable -6dB off-axis. The Wavecor has an on-axis response bump above 12.5kHz, resulting in a nice off-axis response, though it only benefits those of us still young enough to

hear it. The superior off-axis response makes this box ideally suited for HT surround duty.

The close center-to-center spacing of the midbasses allows it reasonable horizontal dispersion as a horizontally placed center channel. With music input, they deliver a very smooth response, with pinpoint imaging. The sound quality was equal to that of the MTM section of my reference David floor-stander, albeit about 10dB lower in sensitivity. Those interested in an easy listening bookshelf style speaker for stereo will find these a serious upgrade to the typical offerings of the big-boxes.

The crossover is a 2nd-order/2nd-order, with a nominal 4kHz corner frequency (Fig. 4). A pair of resistors pad the tweeter down to match the sensitivity of the midbasses. Typically, MTMs use 8 Ω midbasses wired parallel, to overcome the baffle step and match

the sensitivity of the tweeter. The resulting 4 Ω nominal load can be problematic, especially for inexpensive HT receivers that are often rated for 6 Ω operation. The 8 Ω load of the Occam is very friendly for those receivers, whose owners would seem to be the perfect target demographic for this cab.

MEASUREMENT PROTOCOL

I took measurements outdoors, at 1m, unweighted, with a 2.83V swept sine input. I averaged ground plane and cabinet center axis measurements to approximate half space anechoic conditions. I made measurements with the grille in place. *ax*

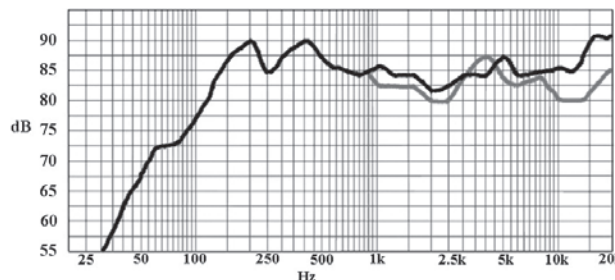


FIGURE 3: SPL, on-axis and 30° off-axis.

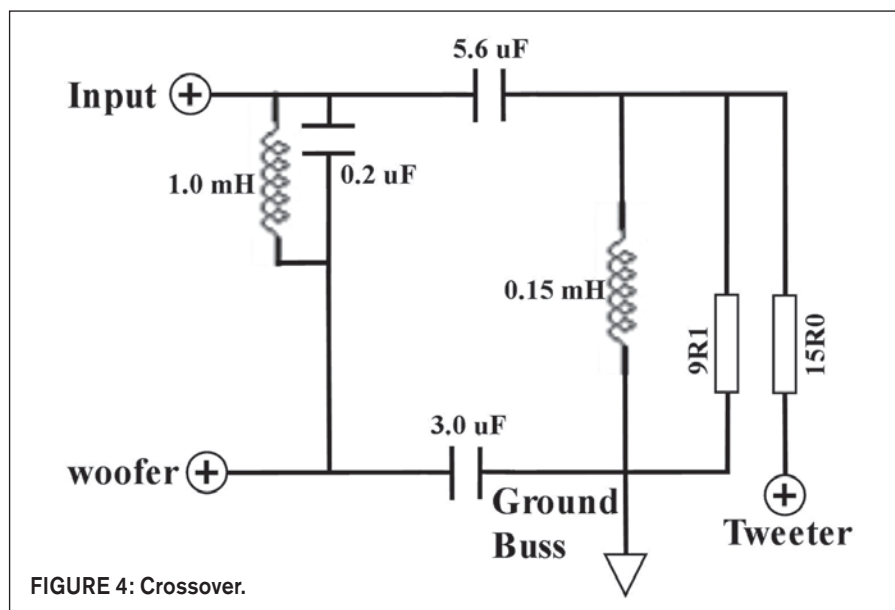


FIGURE 4: Crossover.