by: Jim Griffin - Mark Audio Alpair 10 MLTL Design [1]

Recently I designed and finished a MLTL with the new Mark Audio Alpair 10 full range driver. While the Alpair 10 might initially be considered as a clone of the Jordan JX92S driver, several differences can be discerned. First, the composite frame of the Alpair is larger and thicker than the cast metal frame of the Jordan. Next the basket of the Alpair is more massive than the Jordan driver so my past experience with a cracked frame with a Jordan driver will not be repeated with the A10. The Alpair 10 cone is attached via a concave surround versus the standard top mounted convex surround on the JX92S. Bottom line is that the two drivers are similar in their spun aluminum cones but their construction is substantially different.

My Alpair 10 MLTL design was developed with help from the excellent Martin J. King's worksheets. With the MJK worksheets the design process develops by entering the T/S parameters of the driver and a set of starting dimensions for the box and driver to port locations. Then you iterate the dimensions to achieve a desired response. My starting dimensions were derived from the Jordan JX92S 48" design which was originally derived by Greg Monfort (GM) and later used in my 'Jordan with a Ribbon MLTL' version. I noticed that Sd and Vas of the A10 driver are larger than the Jordan parameters so I expected that changes to the cross-sectional area of the new MLTL enclosure would be necessary. But overall the similarities between the remainder of the Alpair 10 and Jordan JX92S parameters enabled me to quickly converge upon a design with an F3 of 34 Hz on for the low frequency response. The 4 inch long port tunes to 37 Hz. I found that lengthening the port tube to 5" will lower the port tuning and the F3 point a couple of Hzs I'm using the 4" port for my prototypes.

My Alpair 10 MLTL prototypes were built from solid cherry hardwood for the sides and top with MDF for the front, back, and bottom panels of the box. The overall external box dimensions for my enclosure (with 0.75" thick material) are 47" H x 7.5" W x 6.75" D. The internal dimensions are: length (top to bottom) 45.5", driver distance from the top 15.5", port distance from the top 44", with a straight cross-sectional area of 6" wide x 5.25" deep, stuffing density of 0.50 lb/ft^3 (on stuffing: What I stuff is the upper portion of the line from just below the driver to the top. Hence, no stuffing in the lower 2/3rds of the line.), and port radius of 1.03 inches with a port length of 4". I'll take photos this weekend to show-off the new speakers.

Well how do they sound? I completed their assembly a week ago and initially I ran the speakers without any filtering. I was very pleased that the Alpair 10 MLTLs produced great sound from the start even without baffle step compensation. Bass was in adequate quantity without any baffle step compensation if the boxes were close to the wall. Later I moved them out in the room and added 2-3 dB compensation (a parallel network of a 1.5 mH coil and 3 ohms resistor in series with one of the terminals). This network created a sweet yet neutral mix for my old favorites. Vocals are spot on for both male and female voices with no echo or sibilance. The high frequencies are there but I'll take additional measurements after break–in and decide whether any other filtering will be needed.

Well how does the Alpair 10 compare to the Jordan JX92S you may ask? The Alpair 10 tends to need a little larger enclosure volumes than the Jordan driver which I saw in simulations in sealed, bass reflex, and MLTL models. The larger Xmax of the A10 yields a little lower bass and higher overall SPL versus the JX92S. Furthermore, the larger frame of the A10 assures that you will need some baffle redesign because the two drivers have different foot prints. They apparently need less baffle step compensation. Bottom line is that given their relatively pricing, I would say that the A10 is an excellent value compared to the JX92S. The Alpair's sound is comparable enough to the Jordan so that most users will be able to achieve that single driver magic at a lower cost.

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1. http://www.diyaudio.com/forums/showthread.php?s=&threadid=137585