

SP-10A-1 Single Driver Speaker



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Single full range driver speaker that is simple and relatively full proof for the novice cabinet maker. Excellent public address speaker with full range performance without tricky cross-over networks or complex box construction. Consists of a 45 liter (1.6 cubic foot) box with a sloping front and tuned with a 3 inch by 3 inch diameter port.

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Applications:

- Designed specifically as a public address system for both a live speaker and program source content.
- Lack of cross-over complications (using single full range driver) minimizes phase distortion and artifacts making this an inexpensive but very good sound system speaker.
- Two or more speakers provide a reasonable stereo or surround sound speaker system.

Features

- Single full range driver (no cross-over complications or phase distortion)
- Simple ported box construction
- Medium size enclosure with full range performance
- MDF $\frac{3}{4}$ inch thick with solid wood cleats reduces parasitic resonances
- Re-moveable grill cloth frame using a tack-less grill cloth binder
- Re-moveable back panel with $\frac{1}{4}$ " phone jack
- Textured paint finish allowing easy touch-up for "travel scars"
- Carpet filled furniture slide feet

Specifications

Performance is dependent upon the basic driver as well as the speaker box construction. The prototype speaker was built with an old 8 inch Utah full range driver circa 1975. I am not equipped to do acoustical measurements, so can not offer measured performance, but empirically it seems the mid-range is accentuated.

My application is a public address system used at a picnic, so an extra mid-range punch seemed fine, but the response may not be applicable for better drivers.

Since I can not carry a tune in a bucket, I refer the reader to audiophile magazines and web based organizations for technical acoustical design and performance information.

Design

Based on an audiophile magazine article that recommended a 45 liter box, ideally with not all sides parallel and a 3 inch port using a single full range driver. I used a sloped front 1.56 cubic foot box built from MDF and solid wood cleats. I tuned it with a 3 inch S&D (schedule 40) PVC pipe 3 inches long.

I did not allow for the volume reduction of the cleats so in reality did not quite meet the 45 liter recommendation, but performance (from an non-expert observer) is surprisingly good.

The shape and dimension I selected seem to avoid cabinet resonances that I was expecting. Only the back seems to have some tendency to approach annoying, but not significant enough for further effort.

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Figure 1. Speaker box viewed from front and side. The speaker frame is attached for fitting and the port is visible below the driver opening. Note the dimensions are inside dimensions required to meet the 1.56 cubic foot volume.



Figure 2. Speaker box viewed from back. Double cleats are used for the back to reduce the slab area and stiffen the side to back corners.



Figure 3. Speaker grill cloth frame. Eight black Phillips-head cabinet screws attach the frame to the box.



Figure 4. Speaker grill cloth frame from the back side. The grill cloth is stretched and clamped into 3/8" dado cut 5/16" deep into the frame. Wooden strips are cut and planed to wedge fit the cloth into the dado. Note grill cloth is cut away from the screw holes to void being pulled by the screws upon installation.