Project description

This project was designed and built by the students in the spring 2007 Audio and Speaker-building class (originally proposed by Andrew Brockert). It is a small, inexpensive 2-way speaker using a 7" aluminum cone woofer and 1" fabric dome tweeter. The cost of drivers and crossover components is about $60 per pair. Expect to spend around $80 to $100 total if you're building speakers for the first time!

Parts list for 1 pair

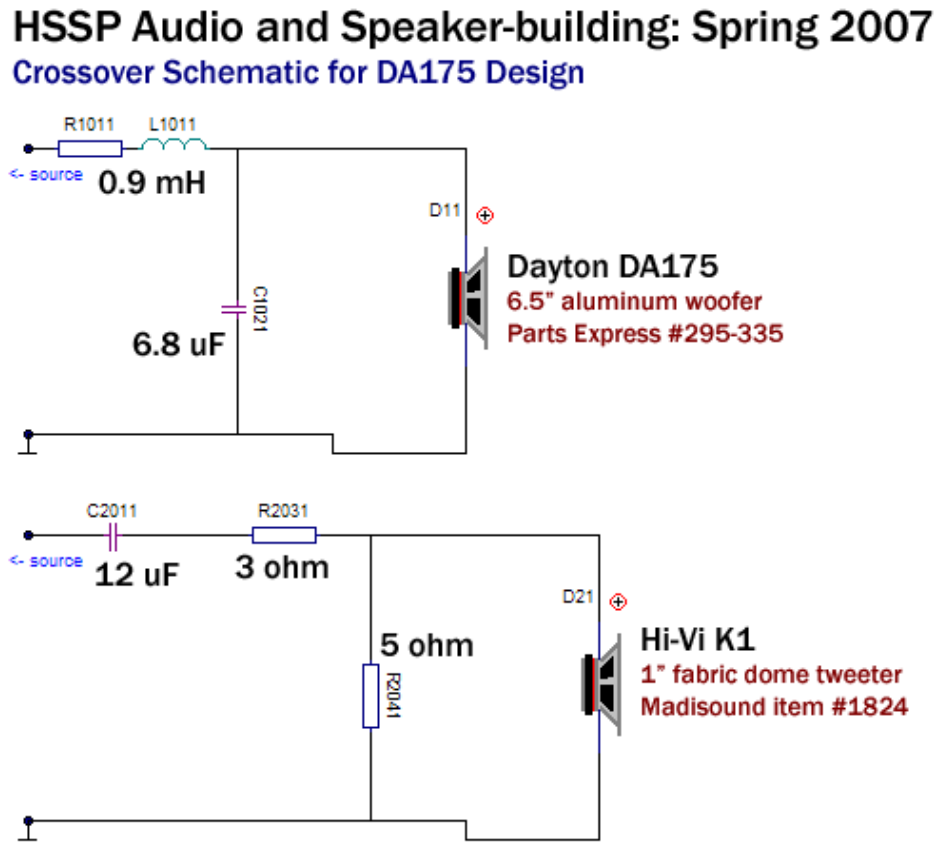
Part	**Quantity**	**Cost**
Drivers		
Dayton DA175 woofer	2	$18.15
Hi-vi K1 tweeter	2	$17.10
Crossover components		
0.9 mH, 20 awg air core inductor	2	$8.48
12 μF, 250V MKP capacitor	2	$7.10
6.8 μF, 250V MKP capacitor	2	$4.50
3 Ω, 10W resistor	2	$0.78
5 Ω, 10W resistor	2	$0.78
Accessories		
Terminal cup	2	$0.98
Male 1/4" crimp connectors	50	$3.50
Female crimp connectors	50	$3.25
#8 x 3/4" wood screws	100	$2.25
16 awg speaker wire	50 ft.	$7.44
Pocket solder pack	1	$2.12
Total		$76.43

Picture

The completed speakers look like this. You can paint them or apply some more interesting finish (vinyl or plastic laminate, or even wood veneer).

Crossover schematic

This crossover network uses a 2nd-order lowpass (including mild baffle step compensation) to filter the woofer, and a 1st-order highpass and about 6 dB of padding on the tweeter. Feel free to modify the 3 ohm resistor in the tweeter circuit if you'd like to experiment with the tone of your speakers; less resistance will make the speaker sound "brighter," and more resistance will make it sound "warmer." More complicated networks would be a good idea with these drivers, but we're on a budget here!



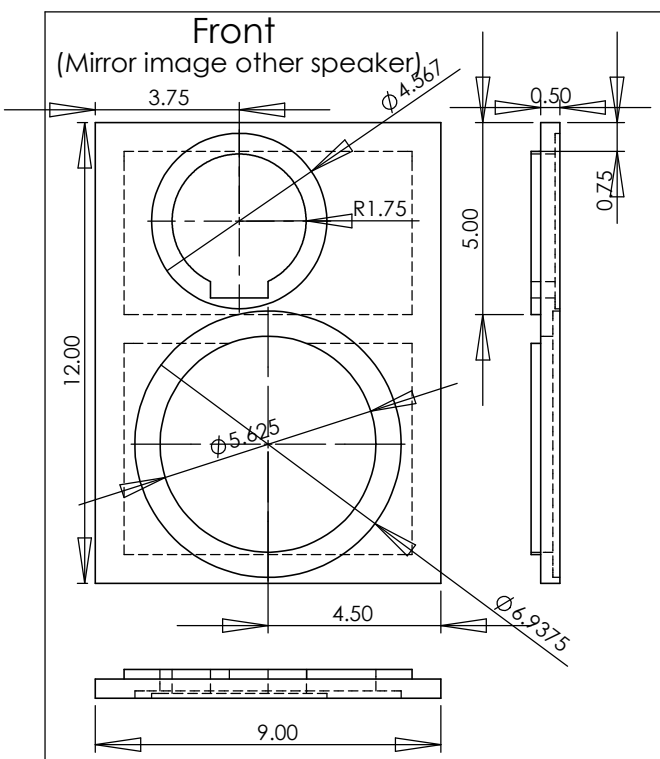
Cabinet plans

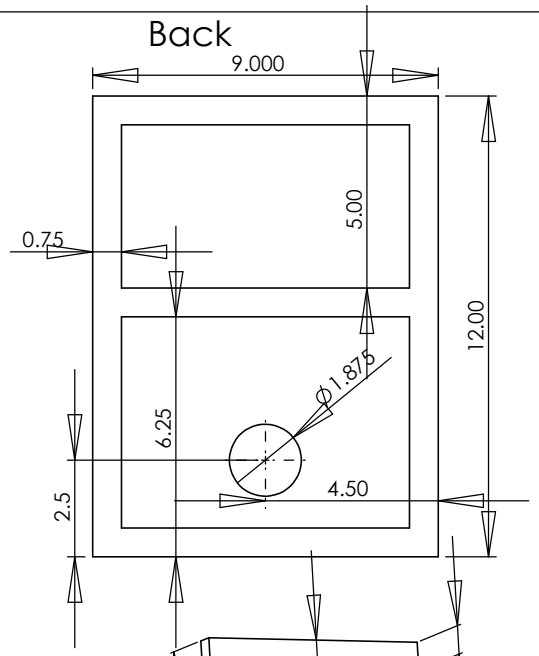
CAD drawings of the cabinets are on the next page. We built the cabinets using 3/4" thick MDF (medium density fiberboard), which can be purchased inexpensively at any large hardware store (check the lumber section). Three pairs of these speakers can be built from each 4x8' sheet!

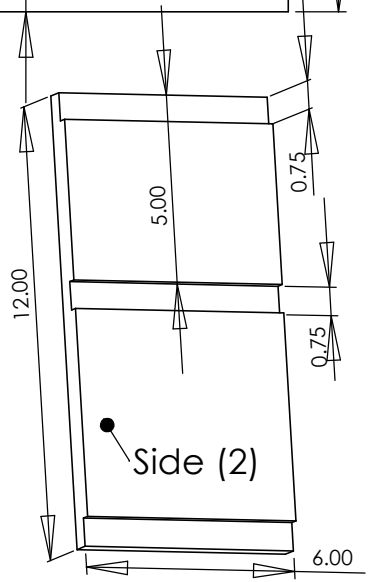
HSSP Audio and Speaker-building Spring 2007 Speaker Project

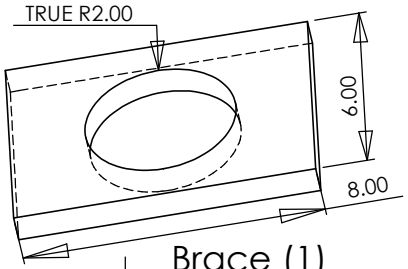
Designed by students
Questions? Contact Michael Price

Woofer: Dayton DA175 7" aluminum cone
Tweeter: Hi-vi K1 1-1/8" soft dome









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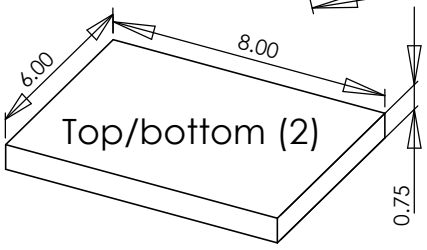

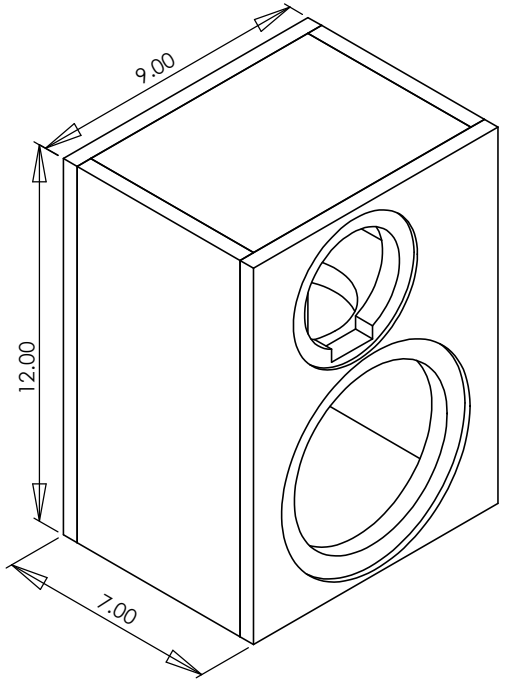

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN		
			CHECKED		
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL	COMMENTS:		
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			

TITLE:

SIZE	DWG. NO.	REV
A	speaker	
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

5 4 3 2 1

Audio and Speaker Electronics

Spring 2007