2008 AES Speaker Building Party

Saturday, 2 Feb 2008

What you need to know.



Matt Poese & Steven Garrett

30 Jan 2008

AES Chapter Design Challenge

Five graduate student designers (left to right)

Kevin Bastyr, Mike Daly, Nelson Kottke, **John Heake**, and Matt Poese

Some Speaker Building Party Photos

2006 Speaker Building Party

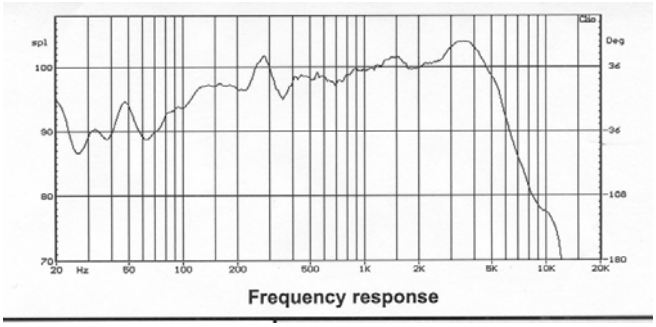
Three Tasks

- **Set-up and clean-up**
- **Cross-over wiring**
  - Function generator testing is recommended
- **Enclosure manufacture**
  - Tweeter enclosure and elbow interface
  - Woofer mounting screws and ring
  - 5-way binding posts
  - Sealing the base

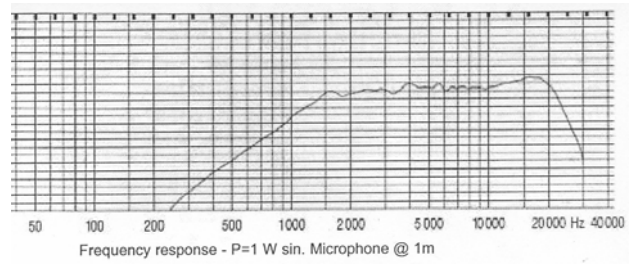
Job List

Job List	First Name	Last Name	Time
Locks and Electric Hand Drills	Chris	Barber	Both
	Kevin	Brown	Both
Oscillators and Multimeters (F-benches)	Matt	Poese	Both
	Steven	Garrett	Both
Soldering Irons	Joyce	Rosenbaum	Both
	Denise	Miller	Both
Hand tools (pliers, dykes, strippers, etc.)	Chris	Applegate	Both
	Robert	Williams	Both
314 Hammond F-locker shelf & benches	"Sonic"	Cho	End
	Jason	Bostron	End
313 Hammond benches	Fred	Holt	End
	Paul	Burkholter	End
313 Hammond tools	Jeremy	Joseph	Both
	Devin	Ott	Both
313 Hammond floors	Scott	Porter	End
	Joseph	Porter	End
Floaters	Doug	Wilcox	Both
	Brett	Bissinger	Both
	Mark	Ballora	Both

It’s the speakers!

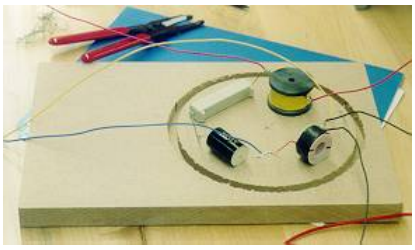


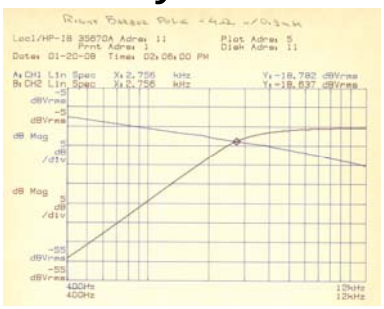
Frequency response

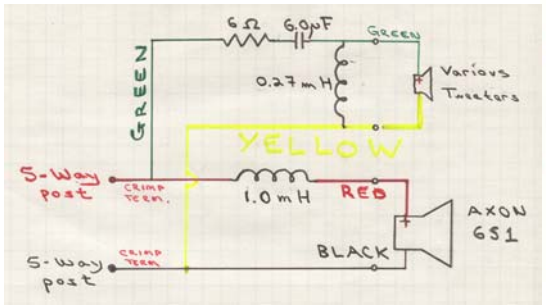


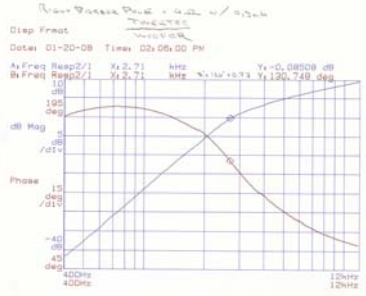
Frequency response - P=1 W sin. Microphone @ 1m

Crossover Assembly

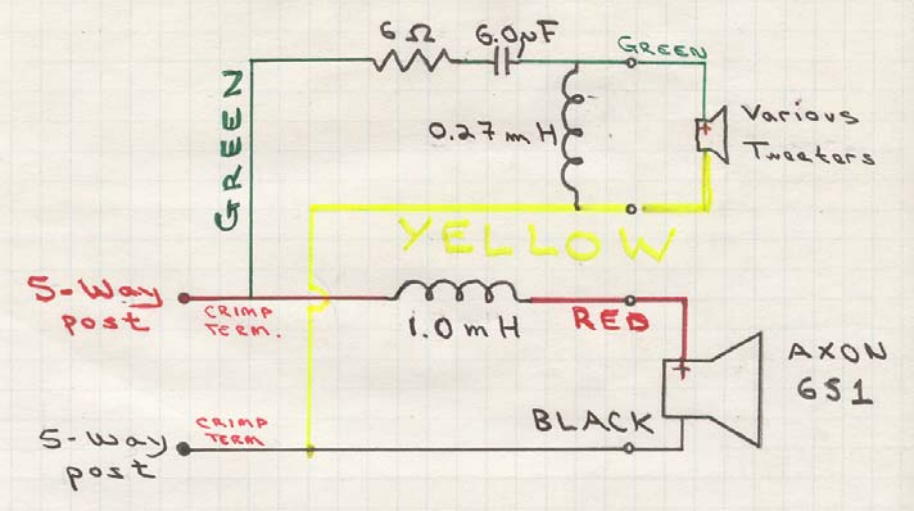

Use hot glue gun to bond components to base.



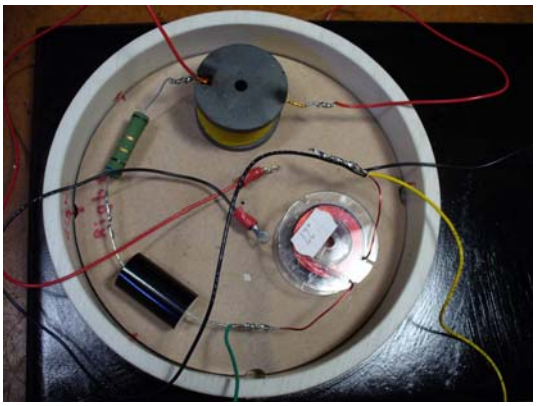


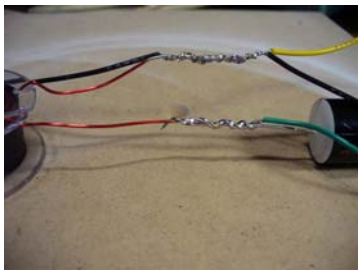


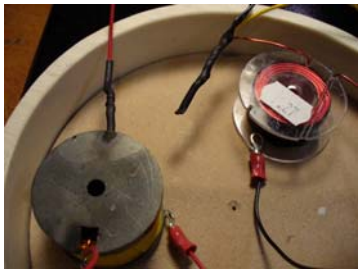
Cross-over Wiring Schematic



Cross-Over Soldering







- Observe the wire color code.
- Use lugs to connect to 5-ways.
- Solder joints should be mechanically sound before they are soldered.
- Use “shrink fit” insulation

Enclosure Manufacture

Dr. Liu says:

“Wear eye protection at all times in 313 Hammond.”

90° Elbow – Woofer Interface

¾” ring also provides sealing surface.

Surfaces should be **flat**.

Drive screws before mounting woofer.

Wax (paraffin) makes it easier to self-tap.

Tweeter Enclosure Cap

This is the most difficult step!
#6 x ¾" screws require #31 drill.
Drill can exit cap
Drill interface hole afterward.

Custom clamping fixture
with lower support block.

90° Elbow – Tweeter Cup Interface

¼-20 Hollow bolt and 8-32 x 1" Steel Flathead with Nylon washer.

Use calipers for accurate 1" and 1 $^{13}/_{16}$" setback.

Oversize hole for 8-32 with #16 or #17 drill.

5-Way Binding Posts

- Standard ¾” separation
  - Red over black
  - Use drill press and $^{5}/_{16}$” drill.

Crimp connector for rear mounting lug.

Sealing the base

- Do not seal if further cross-over tweaks are anticipated.
- Too much glue will harm paint.
- Cementing of the 90° elbow to 6” PVC pipe is usually not required.
- Add screws as back-up if the speaker is to be hung upside-down.

Polyethylene Floss

- Don't forget to do it!
  - Suppresses enclosure standing modes
  - Increases "acoustic volume"
- Don't over-stuff.

PVC Speaker Parts Suppliers

- Loudspeakers and cross-over components
  - Zalytron, Mineola, NY: www.zalytron.com
  - Axon (German) Woofer (6S1) and Tweeter
- Hardware, shrink-fit insulation
  - Parts Express, Springboro, OH: www.partsexpress.com
  - Black anodized screws P/N: 081-435 and 081-422
- 5-way binding posts
  - Jameco Electronics, Belmont, CA: www.jameco.com
  - P/N: 77690