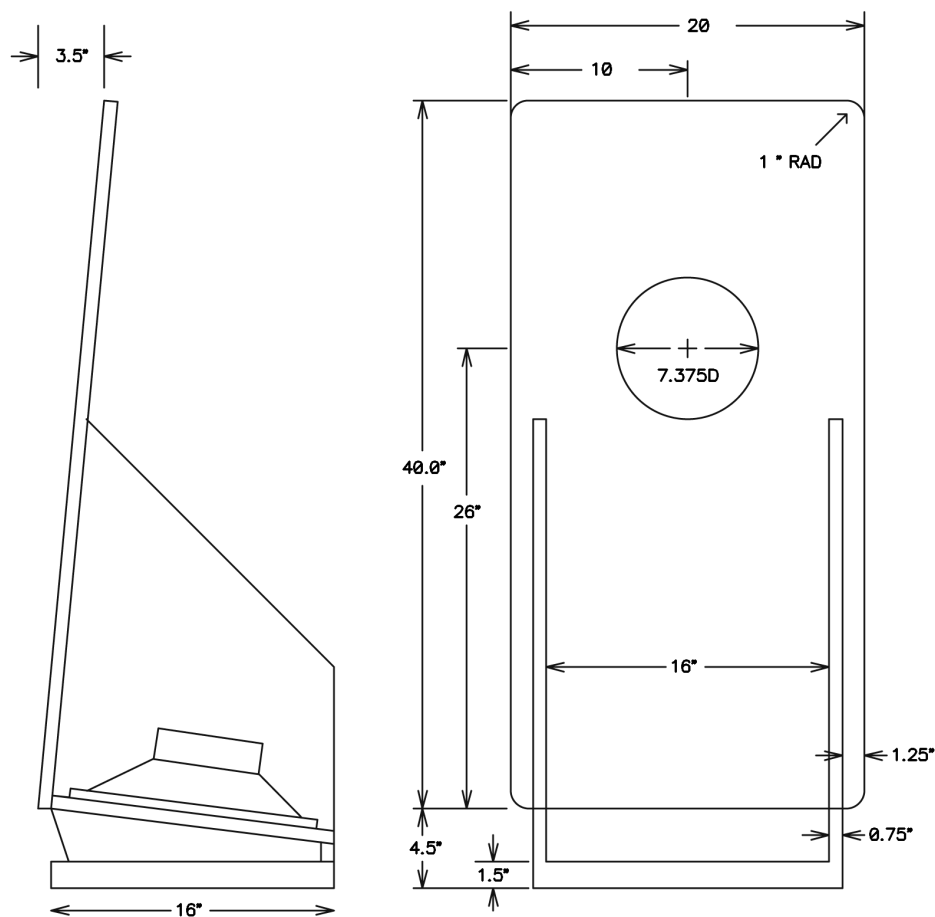


SPEAKER CAMP 2022

BY NELSON PASS

Ten years have passed since the last Speaker Camp Event. I missed it, but I am assured that it was a great success. It featured DIY construction of a Voight type enclosure holding a Pioneer BoFu 8 inch full range accompanied by a small tweeter to sweeten up the top end.

This year the Brocks decided to resurrect the event, and the initial plan was to use those Pioneers in a similar design. These drivers were discontinued long ago, but it so happened that I had about 100 of them in storage. Unfortunately the costs of getting enclosures made had skyrocketed over 10 years, making this approach expensive. Fortunately about 10 years ago I designed a slot-loaded open baffle enclosure (SLOB), detailed elsewhere, and I was so pleased that I had 100 of them manufactured. Here is a diagram:

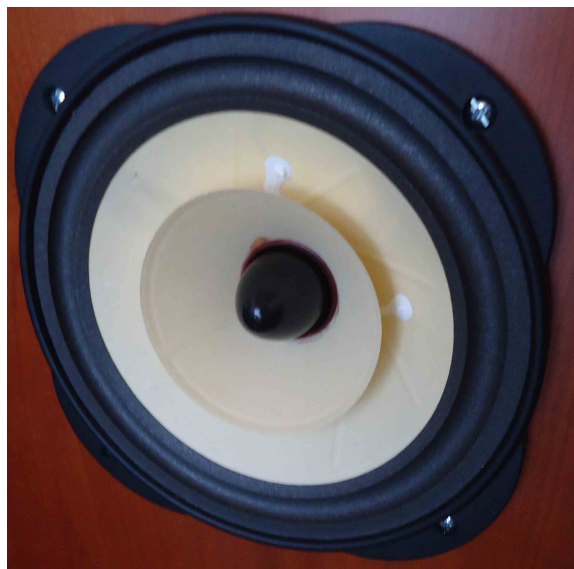


A full range driver is mounted on an open baffle and augmented by a 15 inch woofer facing down into a forward facing slot, an approach inspired by Oscar Heil. The loudspeaker uses an active biamp crossover which also includes equalization for top and bottom.

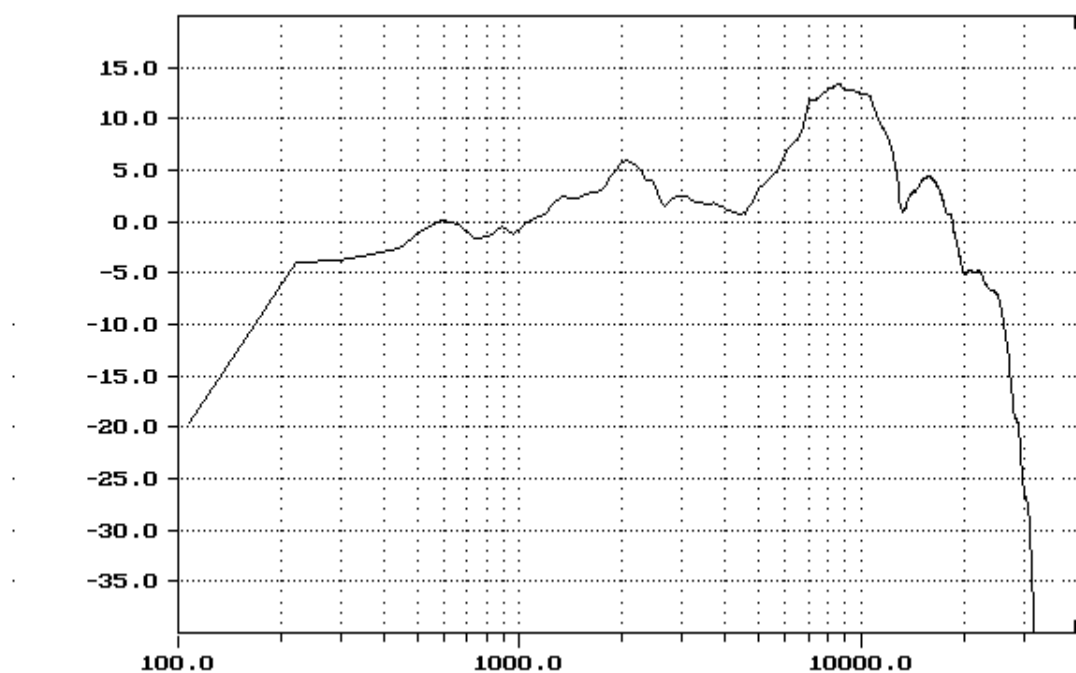
Here is what they look like assembled with a Lowther PM6A and Eminence woofer:



These loudspeakers were originally designed around the excellent Moth Cicada full range driver, and I had a few of these left over from the original project:

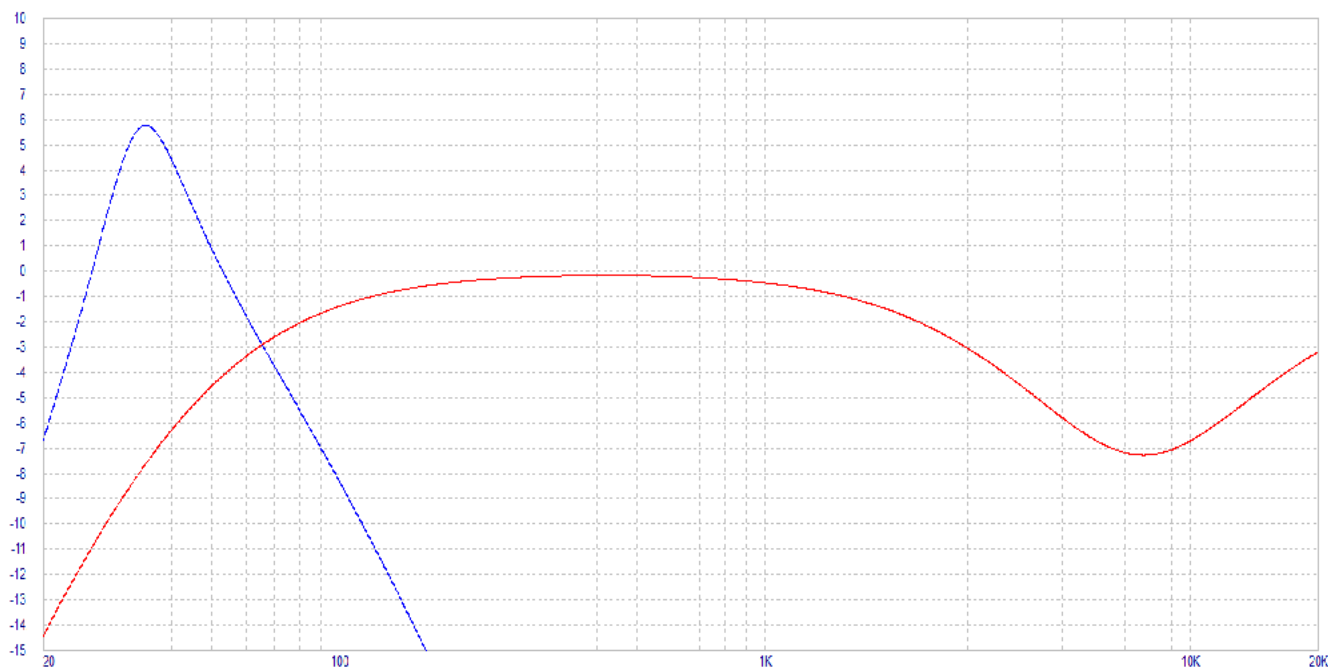


Here is the raw response curve of that driver in an open baffle:

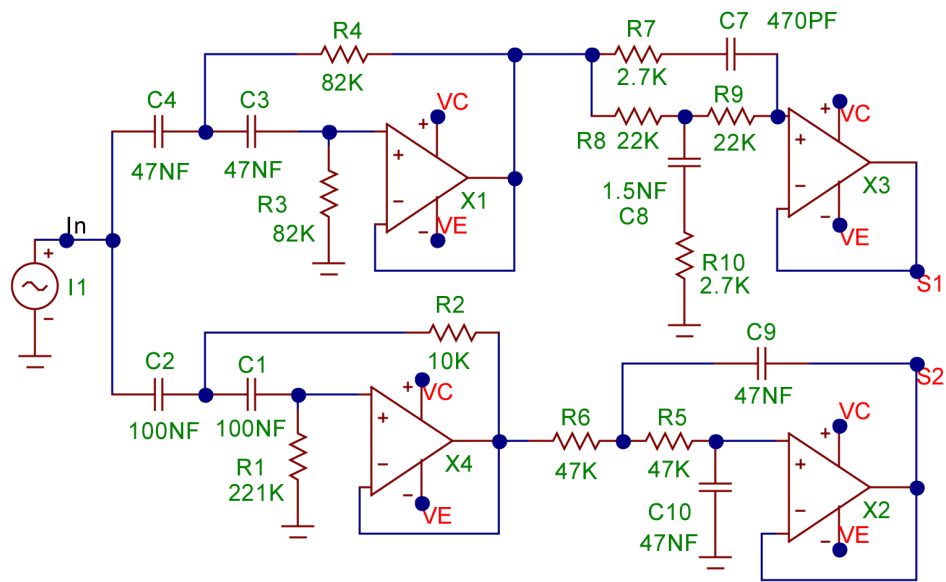


Like many other full rangers, it has a rising characteristic in the upper mid and top, and required some equalization to get the response I wanted. At the same time, the woofer also requires some EQ for the bottom end, and of course both drivers also need crossover filters.

A few adjustments to my analog LX mini crossover design gave me these response curves:

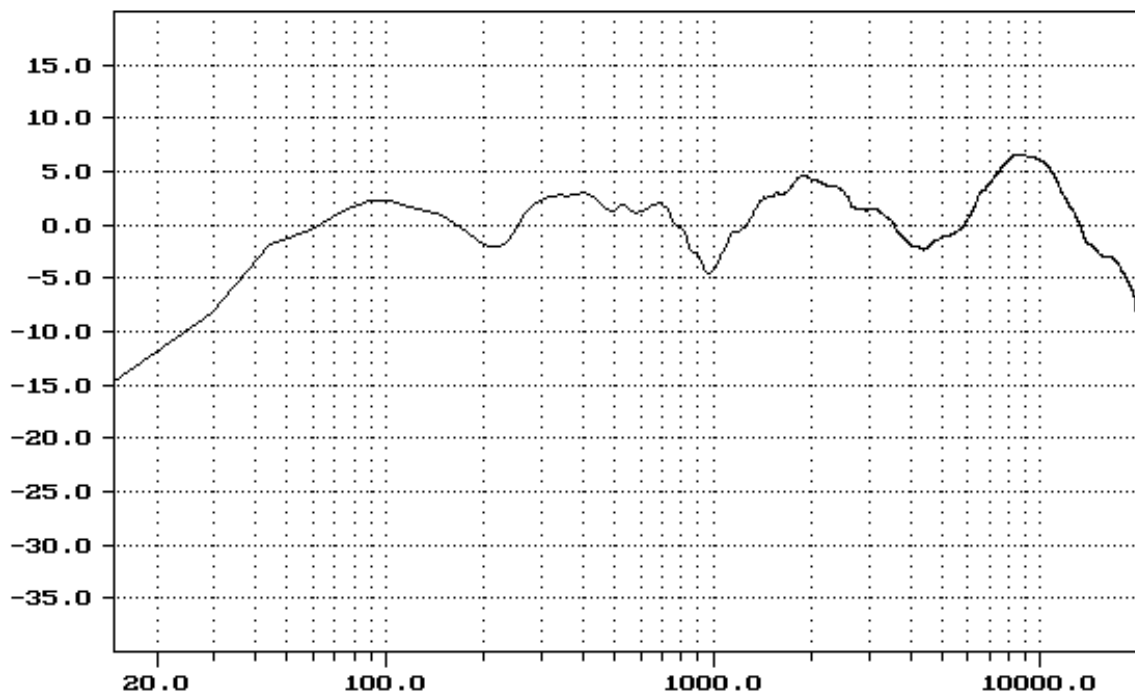


Here is the filter circuit as seen in the previous MicroCap simulation:



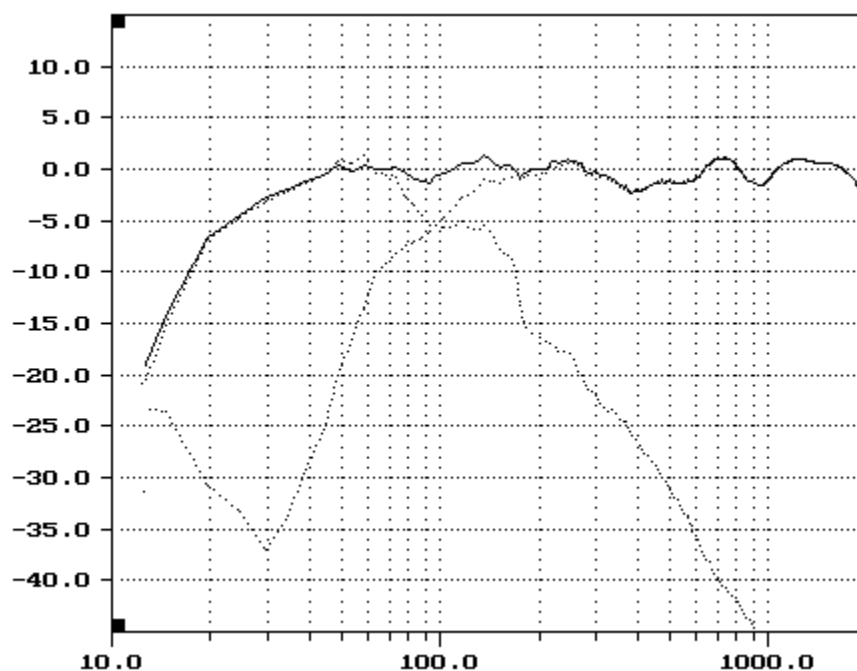
You can download MicroCap from <https://www.spectrum-soft.com/download/download.shtm> for free and play with the values or otherwise modify this circuit to suit your needs. I will post the design file in the Pass Labs forum at diyAudio.com.

Here is the resulting far field response curve:

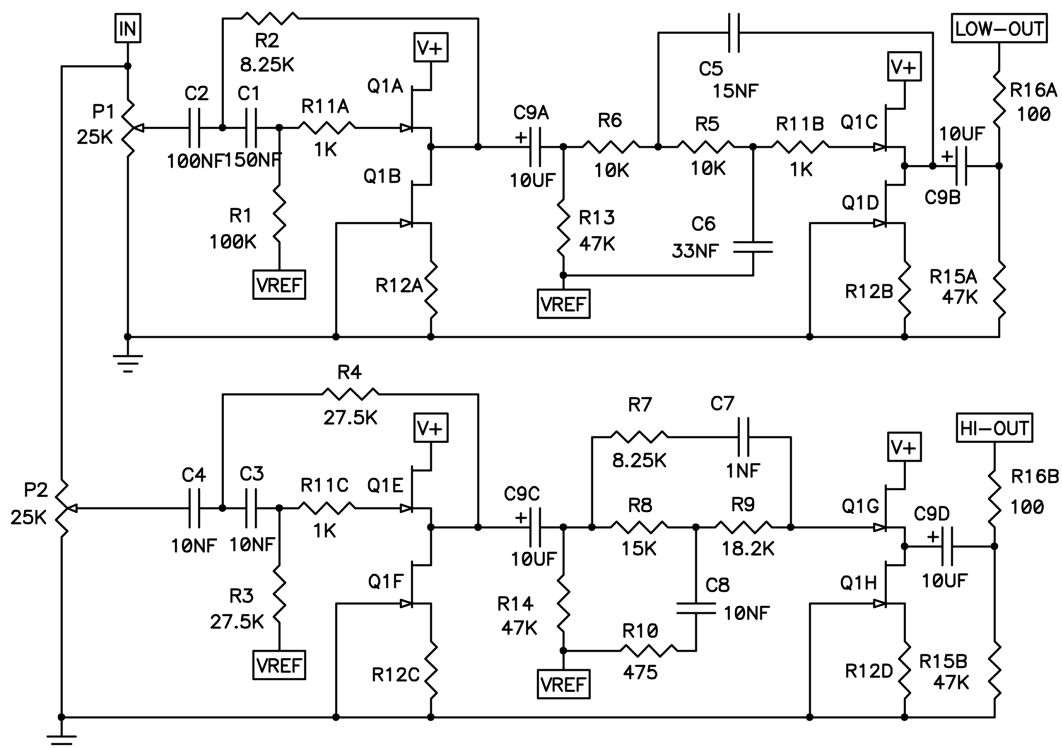


This set of choices has survived the test of time and listening to it again was a pleasant experience.

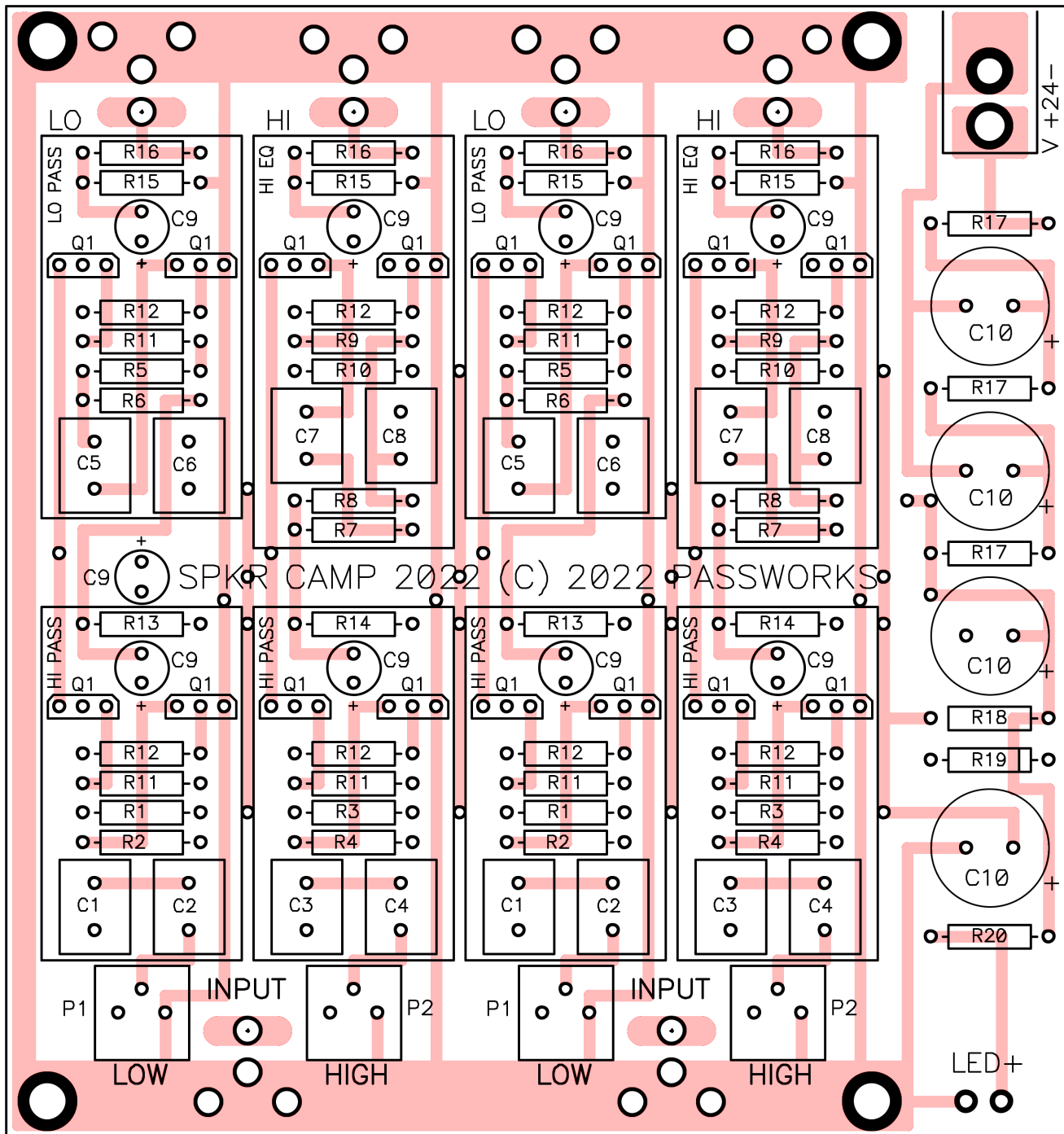
The crossover gives a nice -6 dB point at 100 Hz for both drivers, as seen in this near field curve showing the individual drivers (dotted) and their sum. Remember to invert the polarity of either the top or bottom driver. Running them in phase still gives a fairly flat response, but they will argue a bit over the phase....



Here is the schematic of the one channel:



Here is what the top of the pc board looks like:



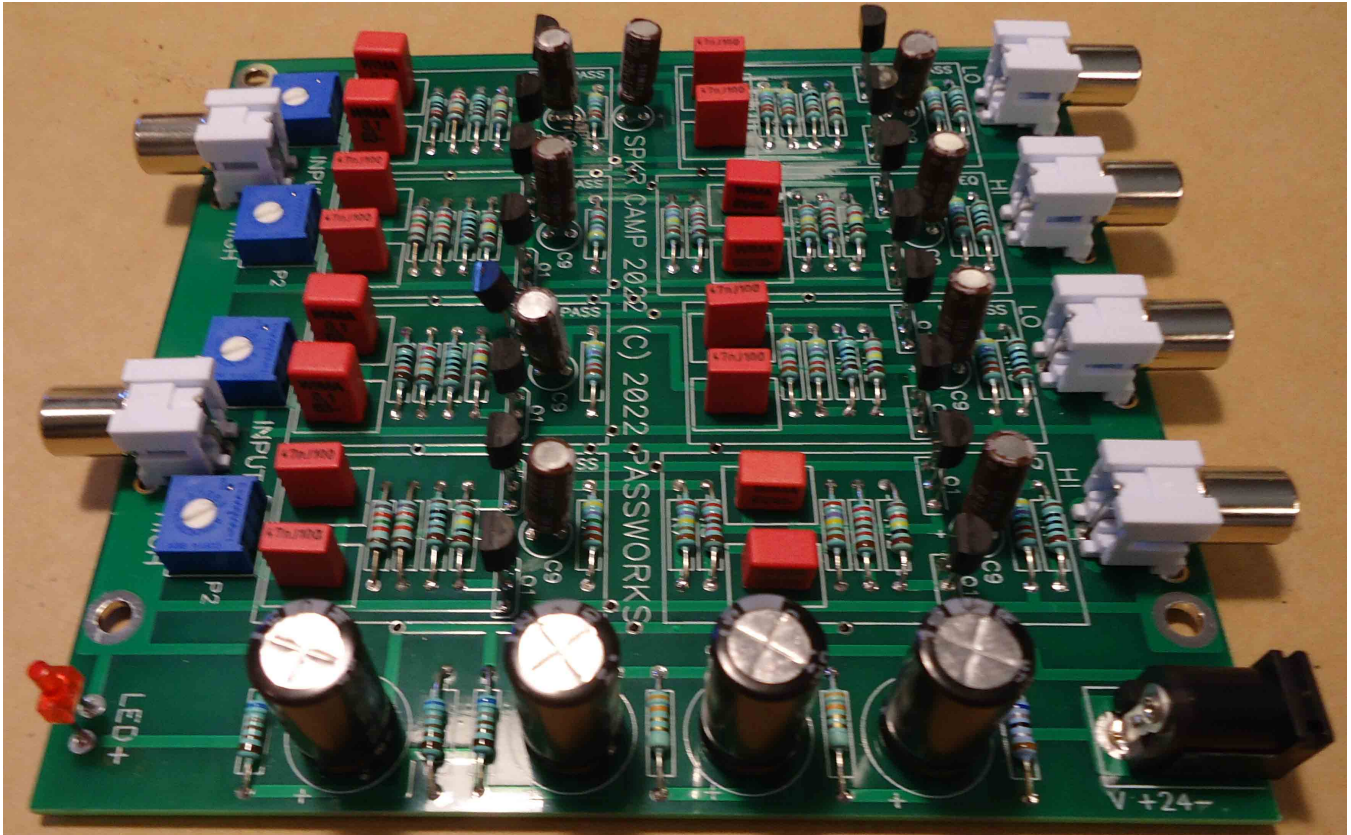
Note that many of the parts have the same reference number, such as R11 or Q1 - they all have the same values called out in the parts list, so don't be confused by that.

The Bill of Materials:

SPKR CAMP CROSSOVER

REF	VENDOR	PART #	QTY	DESC
P1,2	DIGIKEY	3386P-253LF-ND	4	TRIM POT 25K BOURNES
C10	DIGIKEY	493-5913-3-ND	4	CAPACITOR 1000 UF @ 25V
C9	DIGIKEY	604-1050-ND	9	CAPACITOR 10 UF 25V
C1,2	MOUSER	505-MKP2F031001F00JA	4	CAPACITOR 100NF PP
C3,4,9,10	MOUSER	505-MKP2C021001B00JA	6	CAPACITOR 47NF UF PP
C7	MOUSER	505-FKP2C021501I00JI	2	CAPACITOR 470PF PP
C8	MOUSER	505-MKP2F023301B00JO	2	CAPACITOR 1.5NF PP
R1	DIGIKEY	PPC221KYCT-ND	2	RESISTOR 221K OHM .4W
R2	DIGIKEY	PPC10.0KYCT-ND	2	RESISTOR 10K OHM .4W
R3,4	DIGIKEY	PPC82.5KYCT-ND	4	RESISTOR 82K OHM .4W
R5,6	DIGIKEY	PPC47.5KYCT-ND	4	RESISTOR 47K OHM .4W
R7,10	DIGIKEY	PPC2.74KYCT-ND	4	RESISTOR 2.7K OHM .4W
R8,9	DIGIKEY	PPC22.1KYCT-ND	4	RESISTOR 22K OHM .4W
R11	DIGIKEY	PPC1.00KYCT-ND	6	RESISTOR 1K OHM .4W
R12	DIGIKEY	PPC125YCT-ND	8	RESISTOR 125 OHM .4W
R13,14,15	DIGIKEY	PPC47.5KYCT-ND	8	RESISTOR 47K OHM .4W
R16	DIGIKEY	PPC100YCT-ND	4	RESISTOR 100 OHM .4W
R17	DIGIKEY	PPC10.0YCT-ND	3	RESISTOR 3.3 OHM .4W
R18,19,20	DIGIKEY	PPC6.81KYCT-ND	3	RESISTOR 6.8K OHM .4W
LED			1	LED
Q1	PW	J113	16	JFETS
PCB	PW		1	PC BOARD
			1	POWER CONN
			6	RCA CONN
			4	SCREWS
			4	STANDOFFS
			1	POWER SUPP

And a photo of the completed Crossover/EQ



We expect 14 pair of these to be functioning this next Saturday in Sebastopol, with plans for another batch in an event later this year or next year.

And they are serving food as well.

I hope to see you there...

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