

SEAS T14RCY/P-H + ScanSpeak D2010/8513



The SEAS T14RCY/P-H is the heart of this system. Vary hard to find these days. I hope this XP cone unit one day will be available in the EXCEL series of drivers.

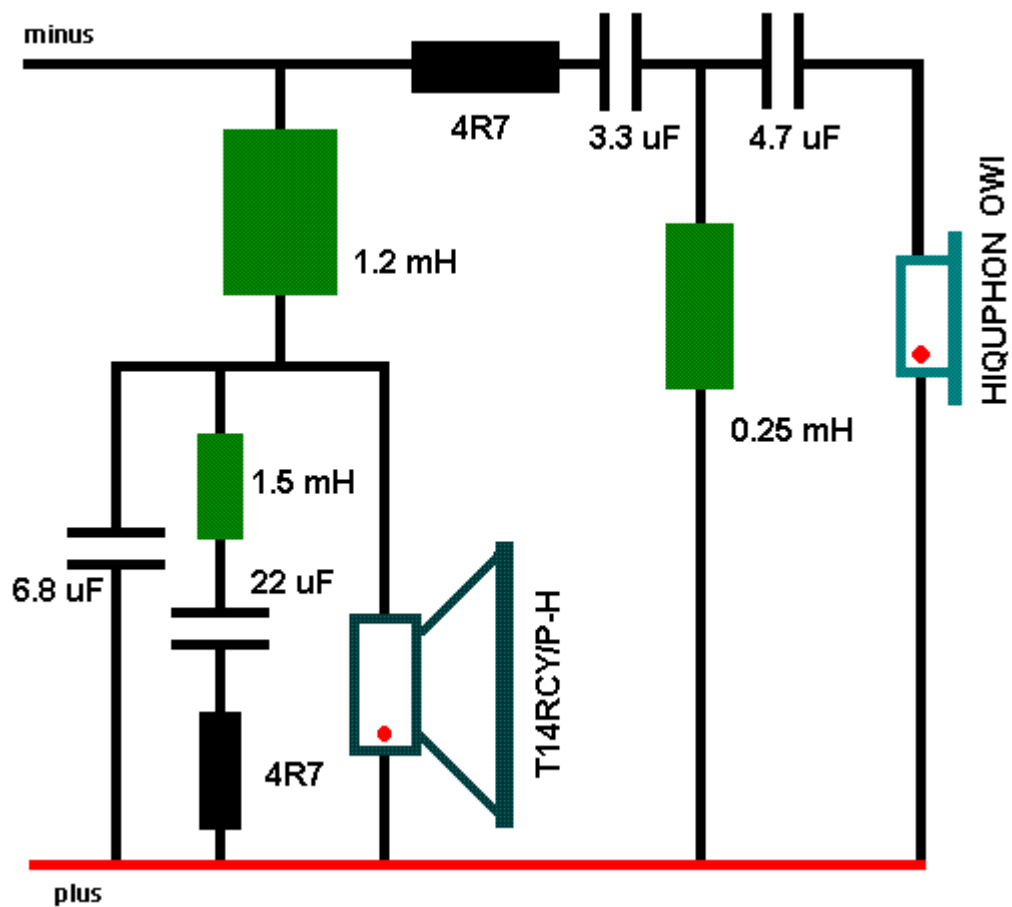


Scan-Speak D2010/8513 and HIQUPHON OWI.

The midbass: In a commercial speaker the transparent XP cone has been fitted into a new EXCEL chassis with a copper phase plug and copper plated magnet parts.

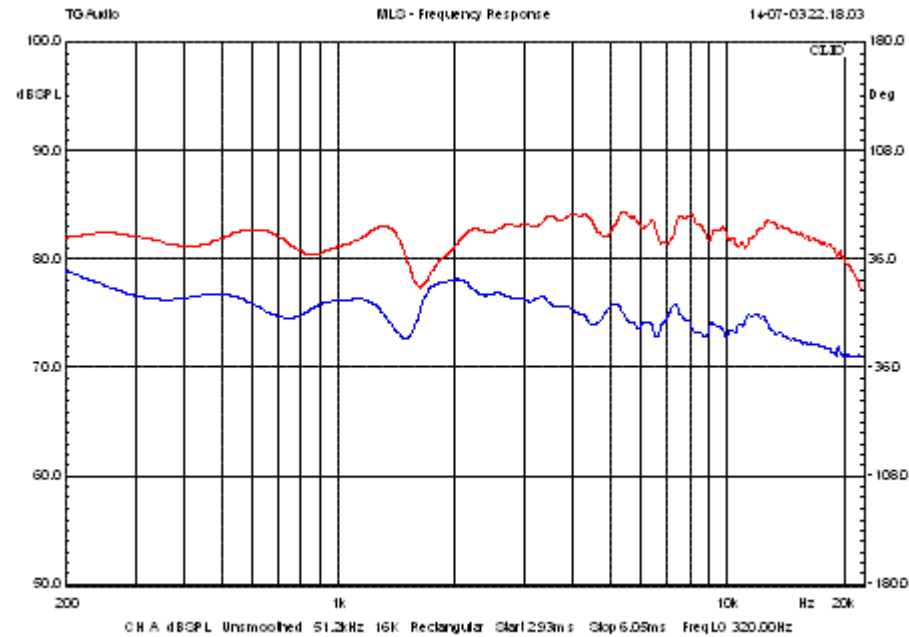
Available for the diy-community is the SEAS T14RCY/P-H driver of more ordinary parts. Except for possibly higher voice coil inductance, this driver may provide much of the same qualities as the OEM driver used in the commercial speaker.

Here's the crossover modified for the HIQUPHON OWI tweeter:



T14RCY-P/H + HIQUPHON OWI crossover.

If the Scan-Speak tweeter is used, use 8R2 to the tweeter due to higher sensitivity.

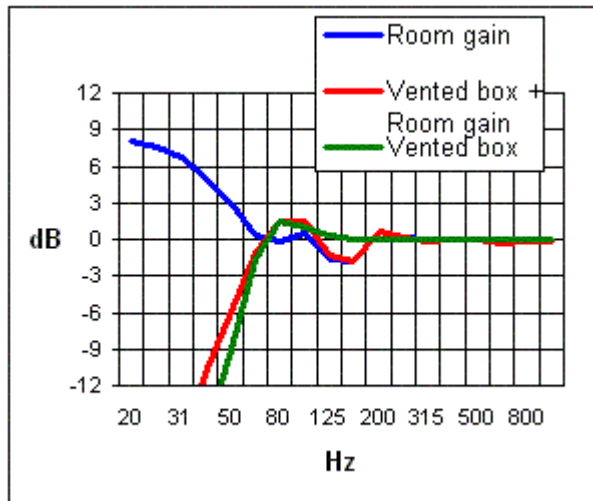


Red = SPL response, 1 meter, tweeter height. Blue = minimum phase.

The OWI is a great tweeter but I will recommend 5R6 to the tweeter to make an even more flat FR.

The overall frequency response from the T14RCY-P/H is not the most beautiful around. But the sound is much better than it appears from the graph above. The ear is highly sensitive to bumps, where dips can very hard to detect. The intrinsic dip at approx. 1.7 kHz from the T14 is derived from resonance in the rubber surround. It can be dampened by placing self-adhesive foam strips on the rubber close to the membrane, but the crossover then needs further fine-tuning, so better leave it here.

Cabinet

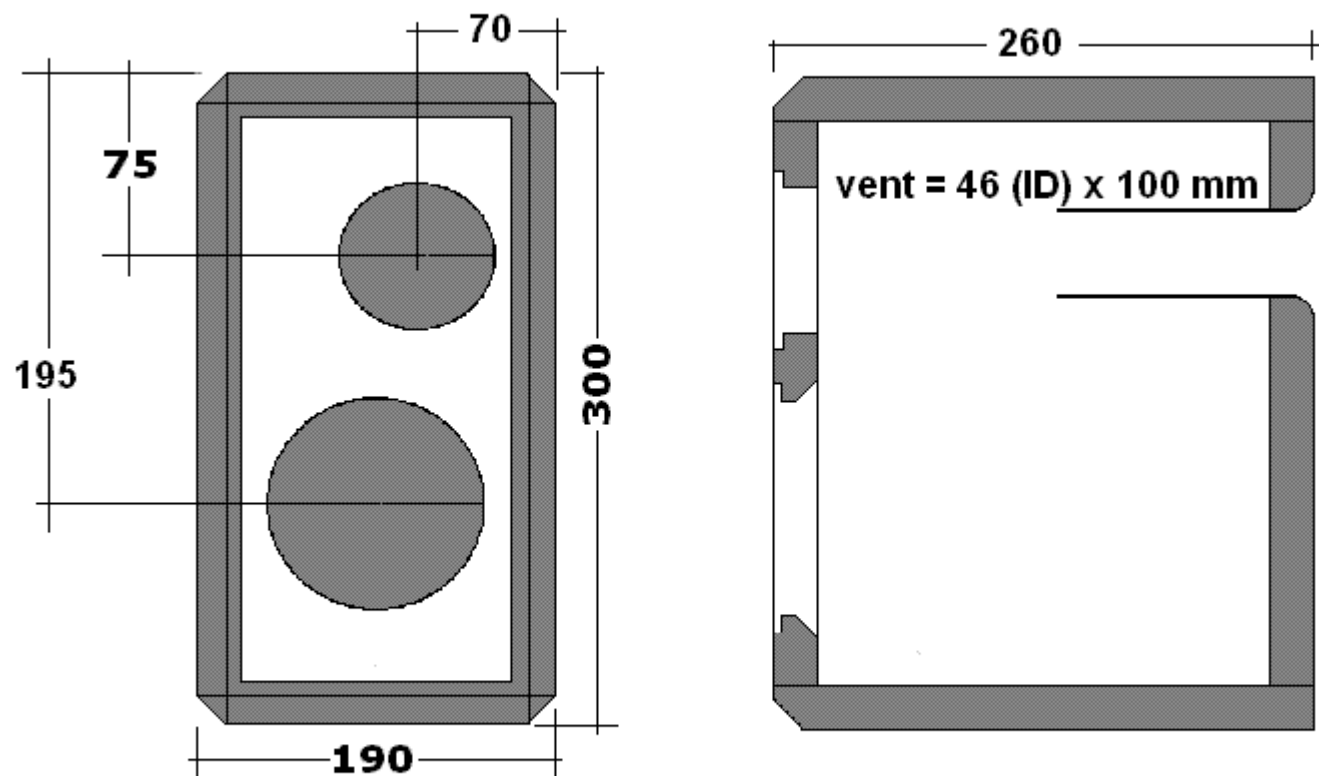


MANUFACTURER		SEAS		T14RCY/P-H	
MODEL		T14RCY/P-H			
Fs	41.2	Woofers:			
Diameter	100	Vas (l)	13.8		
Re	5.79	Fs (Hz)	41		
Rms	1.54	Qts	0.27		
Qms	1.57	Re (ohm)	5.79		
Qes	0.33	Series res (ohm)	0.4		
Qts	0.27	Qtsn	0.288		
Cms	1.60	Vented box:			
Mms	9.3	Vb (l)	7		
BL	6.5	Fb (Hz)	65		
VAS	13.8	Ql	7		
dB SPL	86.7	F3 (Hz)	55.3		
L 1kHz	0.86	Vent diam (cm)	4.6		
L 10kHz	0.33	Vent length (cm)	13.5		
SD	0.0079	Woofers placement:			
		Dist to floor (cm)	80		
		Dist to back wall (cm)	100		
		Dist to side wall (cm)	180		

Above is seen predicted response from 7 liter vented cabinet and vent tuning of 65 Hz. Red = room response with suggested placement of 80 cm above floor level, 110 cm to rear wall and 180 cm to side walls, the actual placement in my listening room.

As usual the vent length calculation is too long to reach a target box tuning of 65 Hz. Use a 4.6 cm (ID) x 10 cm. The cabinet has the outer dimensions of 300 (H) x 190 (W) x 260 (D) mm. With 4 mm bitumen pads on internal sides the internal volume = 7.7 litres minus volume taken by drivers and vent.

T14RCY-P/H + 8513 cabinet



Cabinet dimensions. 19 mm MDF used for all panels.



Internal walls added bitumen pads.

T14/RCY-P/H + D2010/8513 revisited, September 2005

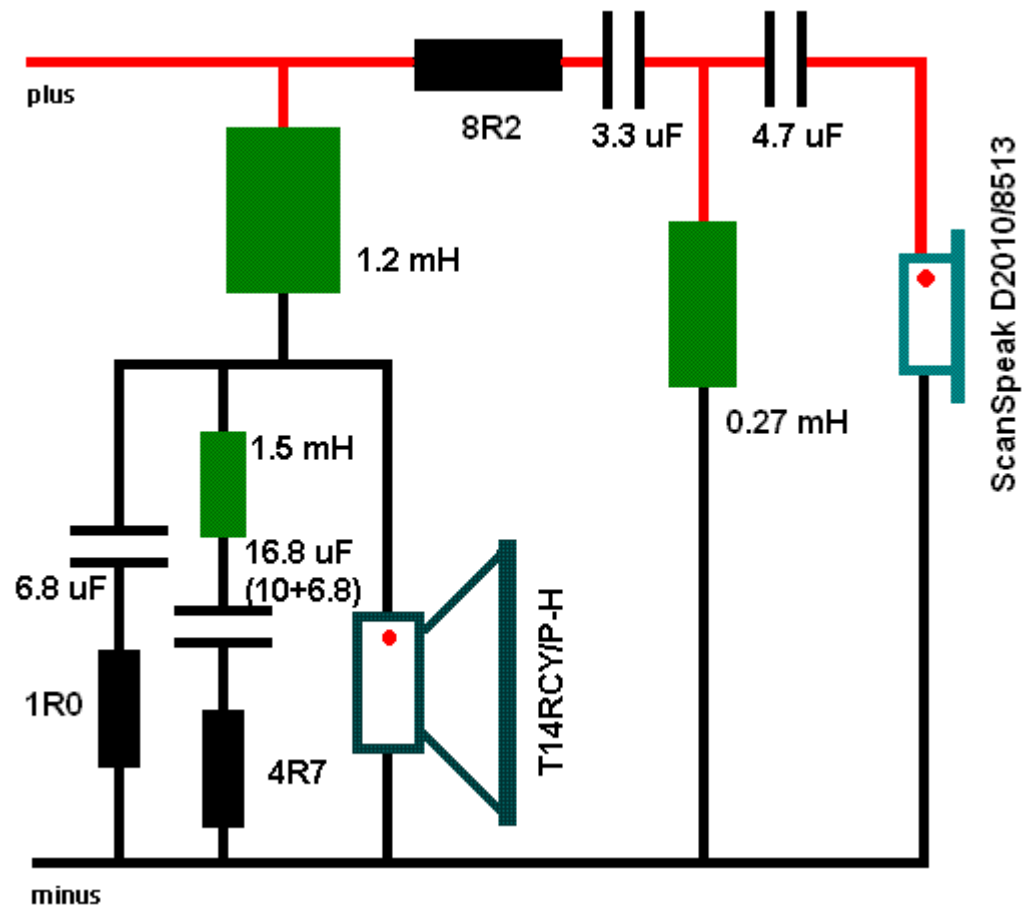
One of my friends needed a mini for his home studio and I suggested the T14RCY+8513 having the XP membrane material giving an ear-friendly midrange with excellent transparency. The 8513 in this company is sweet and gently, nowhere near how it performed with the 18W/8535 driver in the 2.5 Clone. The 8513 tweeter must never be mated with an even slightly harsh midrange.

So, once more the T14RCY-P/H + 8513 - and it was time to see if former crossovers schematics would still be working as shown above.

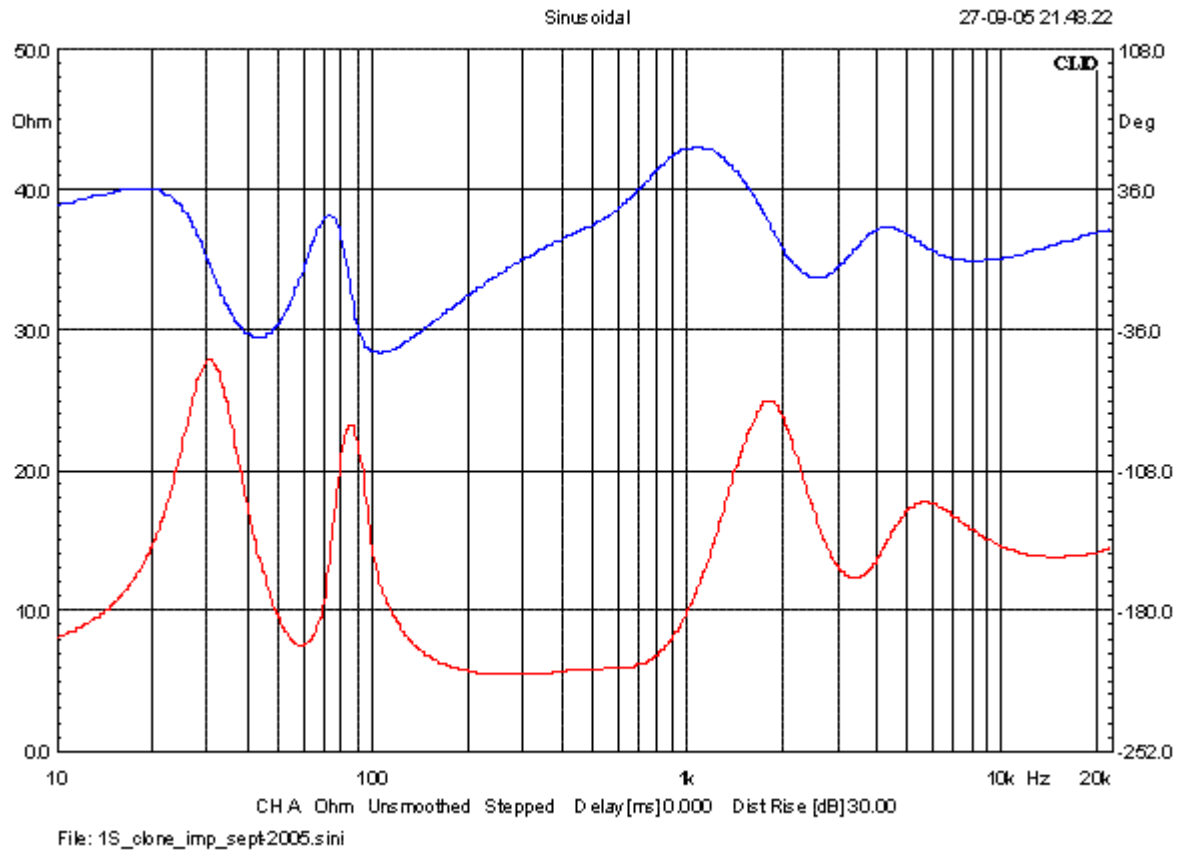


All ready for final assembly. Getting crossovers into small cabinets can be a real problem and make very much sure that the crossover plate can enter the midbass hole before you glue the coils and capacitors in place.

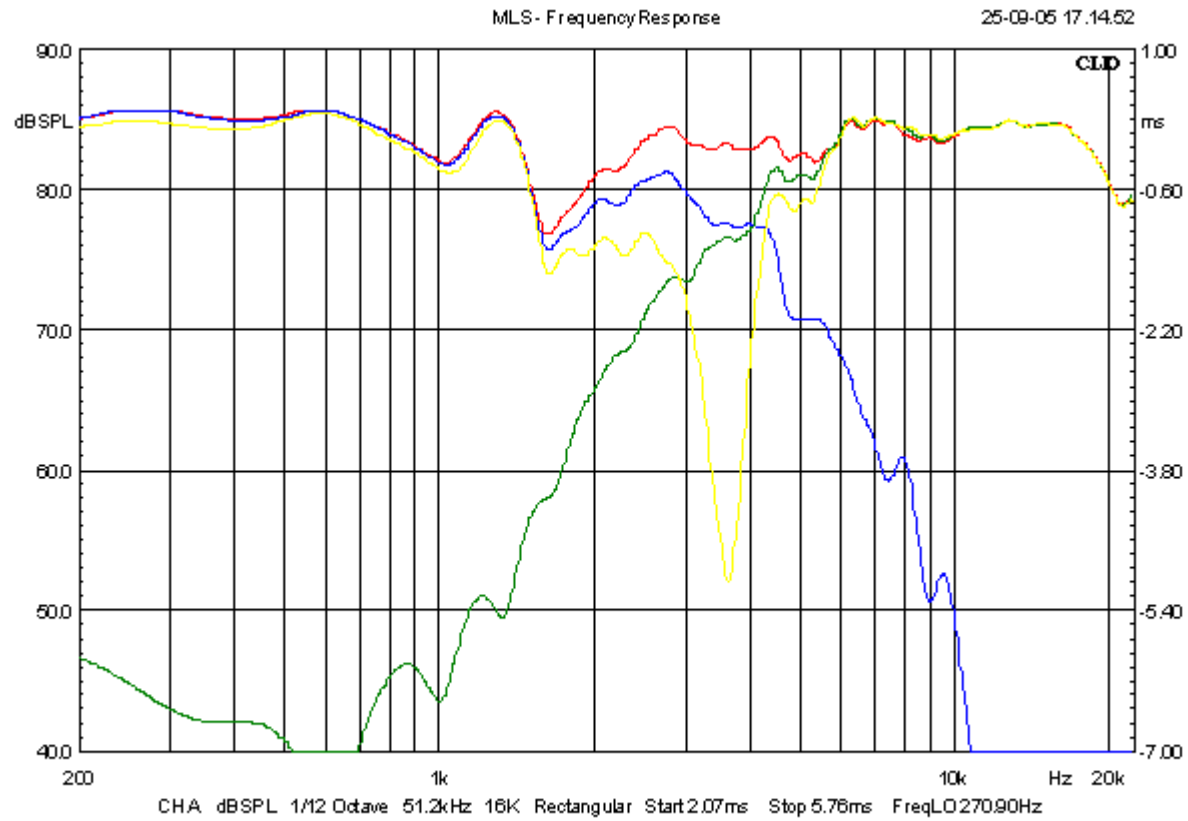
Crossover fine-tuning:



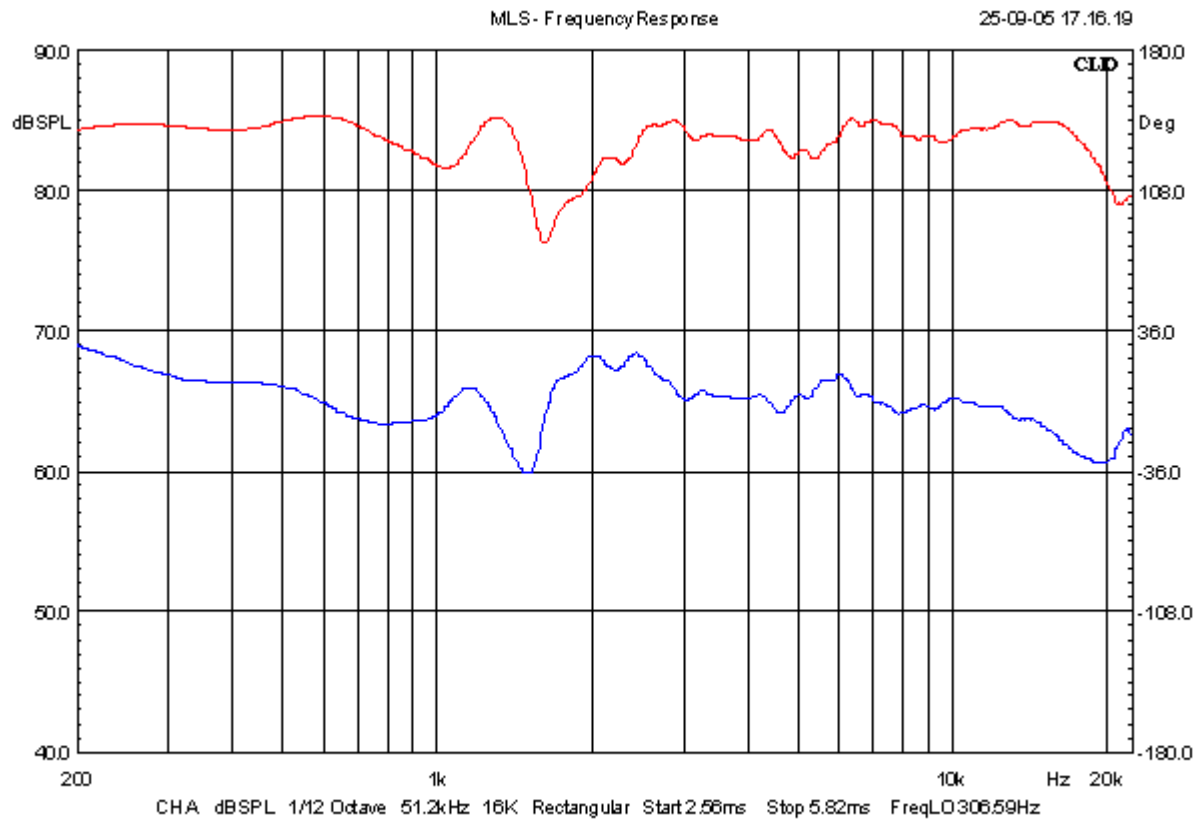
The 8513 needs further attenuation compared to the OWI tweeter and I found 8R2 to balance well with the midband. The notch filter for the bass was changed slightly based on listening to white noise while changing the values of C, R and L combined with measuring the frequency response. The coil in the tweeter section was also changed to a standard value by adding a 1R0 in series with the 6.8 μF capacitor in the low-pass section. Not a big deal, but many do not have the possibility of un-winding a coil from 0.27 mH to 0.25 mH and sometimes it makes a difference, which it does here as the coil is the key component that determines the point of crossover for the tweeter.



Impedance profile of T14RCY/8513. Not much to comment here. 5 ohms minimum impedance. Actual vent tuning is 60 Hz. The vent tuning could be taken a little lower by making the vent 125-150 mm long.



Frequency response of individual drivers, summed response and response with inverted tweeter polarity (yellow).
Point of crossover is around 3.7 kHz, not a problem for the T14 driver.



Frequency response and minimum phase (blue) of new set-up.
Apart from the dip at 1.7 kHz, the overall response is flat with a smooth midrange.

I was positively surprised when I fired up this speaker again. This T14 driver is indeed a very good driver despite some rubber surround resonances at 1.5 kHz. Soundstage is wide and transparent and bass performance better than you would expect from such a small speaker. Well recommended for all kinds of music.

Comments from "tatxo" in Spain:

Mail #1: Not a question, just lots of deep congratulations about your web page, and thank you about your work offered to the community!! I've bought a pair of ProAc Response 1S in China (knocked), but too much brilliant even with my tubes amp! Thanks to the article in your web page I've seen that an 8R2 resistor is recommended to the tweeter instead of the 5R6 of the 1SC original filter (perfectly cloned in China), so I've added a 2R7 in the outside part between the two minus connectors and voilà! my speakers come to live without harsh. I think is something very, very similar and I don't have to broke the fix of the filter inside to get out and replace the resistor. (I think) AND ... I'm too a fan of the dynamics and clean sound pressure of the old series of JBL and I've the L28 instead of the L26 of your webpage, so I replaced the filter too and they sound fantastic nowadays (they fill all the parties).
Again, congratulations !! Regards, tatxo [|-].

Mail #2: I've opened the boxes again (both) for check the filter. First I discovered one big coil moved so I tried to put the spirals again to its place, quite hard. I compared both boxes and it seems to sound equal. I can't check the value of the coils, but the caps of 4,7 and 6,8 (picture of the filter in your web page) was replaced by 5,0uF. Rest of coils and resistors are ok. Sometimes I think I should to remake the filter completely, but it's expensive and the components of the clones seem to be good quality (Bennic). I've observed too a black-red hard wire to the midwoofer instead the other thicker and more isolated wires for the tweeter and the terminals. What do you think it's happening for that too much brilliant sound? Should I replace all the coils because I don't know their value, the wrong caps, or just to apply more attenuation to the tweeter according to my ears? I haven't got measurement equip.

Mail #3: At last I've discovered an inverted polarity in one tweeter, doing a serious dip in the crossover point in one loudspeaker, so the overall tonal balance was wrong and more attenuation was doing something, but little. I've never listened a original proac response so I never thought in such a error (I'm not a DIY expert). Well, I will investigate the correct atenuation for the tweeter soon, thought a 2R7 (taken of your webpage) or a 3R3 will be probably enough.