Convair Electronics 2-way Crossover

Convair Electronics 2-way Passive Crossovers are designed and manufactured in the United Kingdom. We use high quality components throughout, including air cored inductors manufactured in our own workshop in the UK. Premium quality 250V capacitors with ultra low dissipation factor are used, to minimise distortion and losses. Our crossover PCBS have been specially designed to allow flexibility of use when selecting the crossover point and includes space to add attenuation resistors to the high pass side of the filter to allow adjustment for output sensitivity of the high frequency driver to that of the low frequency driver.

The boards are supplied without attenuation resistors, and there is a wire link between connections A and C to connect the circuit. If you are using ONLY R2, put the link between B and C, and if you are using ONLY R1, put the link between A and B. If you are going to use 2 resistors (recommended) remove the link completely. Once you have 2 resistors fitted, you can use the link to bypass one of the resistors to test different attenuation settings. Using 2 resistors in series across R1 and R2 is advisable as this gives better power dissipation than one single resistor. Below is a selection of suggested resistor values for a given attenuation. You can estimate the required attenuation from the average sensitivity of the two output devices. For example, you have a 12" on LF, with sensitivity of 99dB, and your HF compression driver has sensitivity of 106dB, you will need 7dB attenuation on the HF to balance the two devices. For PA applications, 20W resistors are the best option.

Suggested Resistor Values

R1 (Ohm)	R2 (Ohm)	Total (Ohm)	Attenuation	
			8 Ohm load (dB)	16 Ohm Load (dB)
0	1	1	-1	-0.5
1	1	2	-2	-1
0	3.3	3.3	-3	-1.6
0	4.7	4.7	-4	-2.2
1.5	4.7	6.2	-5	-2.8
3.3	4.7	8	-6	-3.5
1.8	8.2	10	-7	-4.2
3.9	8.2	12.1	-8	-4.9
4.7	10	14.7	-9	-5.7
6.8	10	16.8	-10	-6.2
8.2	12	20.2	-11	-7.1
8.2	15	23.2	-12	-7.8
12	15	27	-13	-8.6

You can also add some equalisation to the High Pass Filter Circuit. Many compression drivers are louder in the upper mid region (1000Hz – 4000Hz) and often drop off slightly in response around 7000-10000 Hz. By placing a capacitor (C3) in parallel with R2, or R1 and R2, you can create a 'bypass' circuit, where some of the signal bypasses the resistors at higher frequencies, if you need help with this, you are welcome to drop us an email. You can estimate the capacitor value using the formula to the right, where C is the capacitor value in Farads, R is the Impedance of the tweeter, and Fc is the frequency where the HF response is around 3dB lower than average. Usually 8000-10000Hz is a good frequency. With R at 8 ohms, 2.2uF is usually a good capacitor value to provide a little HF lift to balance to sound more evenly. For 'slight' lift, put a wire across link LK1 to connect C3 in parallel with R2 only. If you want maximum HF lift, put the wire across LK2 to put the capacitor in parallel with R1 and R2. You should then use the sum of R1 and R1 in the formula above. Dont like maths? Dont worry! we have a handy calculator for you: https://speakerwizard.co.uk/category/speaker-systems/crossovers/

$$C = \frac{1}{2\pi R F_c}$$

Crossover Wiring

The standard wiring configuration is to take the Red (+) from your amplifier, and connect this to Input IN+ on the board, you should then connect Black (-) from your amplifier to GND on the crossover input.

The circuit has LF + and HF + marked on it, this is the filtered output for Low Pass and High Pass. GND is linked directly to the GND input and is effectively a common Ground or 0V. It it not always ideal to connect HF+ to the tweeter +, in fact with Butterworth filters, its most common to connect the LF in normal phase (Red to + and Black to -) - but on the HF, you often get the best results by connecting the HF – (Black) to the + output on the crossover, and HF + (Red) to the GND (-) on the crossover. This is due to how phase shift affects the output going the speakers, and how the LF and HF sum together in the crossover region. We recommend connecting HF devices in reverse phase unless specified otherwise, this usually gives the smoothest transition past the crossover point.

Convair crossovers are manufactured in the United Kingdom, and we are able to manufacture to custom specifications, to match virtually any impedance, frequency and alignment. Please get in tough for further details. Custom manufacture will typically require a minimum order quantity, and in some cases, there may be additional fees for custom tuning.