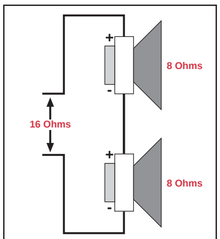
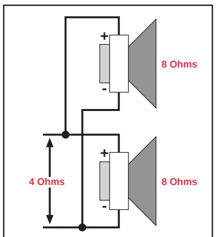
ALTRONICS DATASHEET

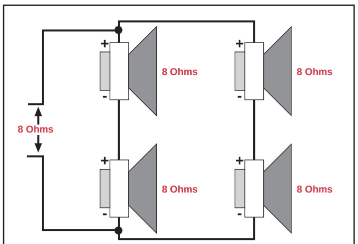
SPEAKERS & CROSSOVERS



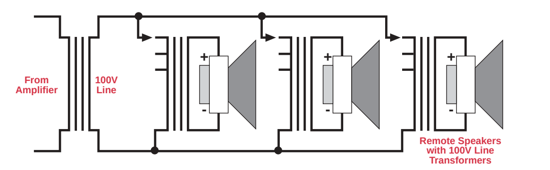
Series



Parallel



Series Parallel



100V Line Public Address System

WIRING SPEAKERS IN SERIES

Speakers in series double the nominal speaker impedance, ie. two 8Ω speakers become 16Ω.. Typically used in band PA speaker boxes, nightclub speaker systems, DJ's systems and car audio systems.

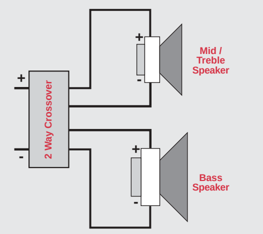
WIRING SPEAKERS IN PARALLEL

Speakers in parallel halve the nominal speaker impedance, ie. two 8Ω speakers become 4Ω. Typically used in band PA speaker boxes, nightclub speaker systems, DJ's systems and car audio systems.

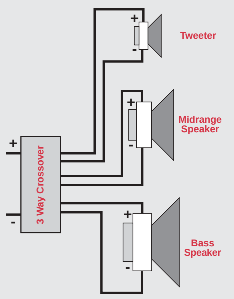
WIRING SPEAKERS IN SERIES PARALLEL

Speakers wired in series parallel are used to maintain the same impedance as a single driver. ie four 8Ω speakers wired in this configuration represents an 8Ω load to the amplifier. This arrangement substantially increases the total SPL of the system compared to one single driver.

TYPICAL HI-FI WIRING CONFIGURATIONS



Two Way Speaker System



Three Way Speaker System

WIRING SPEAKERS IN PARALLEL FOR 100V LINE

Where several speakers are to be used at one time, on one circuit, it becomes necessary to use speakers fitted with line-matching transformers. This is to overcome the effects of connecting speakers in parallel and cable losses. The amplifier system generally has an output voltage of 100 volts. This is then applied to the speaker transformers. In this configuration the total wattage load on the amplifier is derived from adding all the line transformer primary tap ratings together. For example, 70 one watt speakers will have a total speaker load of 70 watts. Or alternatively, it is conceivable to connect 100 one watt speakers to a 100 watt, 100 volt line amplifier.

CONSTRUCTION GUIDE FOR CUSTOM CROSSOVERS

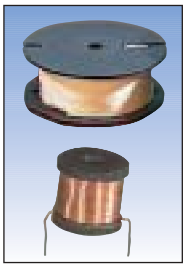
Crossovers are a vitally important part of any loudspeaker system. With this chart, you can design your own crossover using simple building-block circuits. For example, in a three way system comprising of a woofer, midrange and tweeter, low pass, band pass and high pass filters are required respectively. A band pass filter is created by connecting a low pass and high pass in series. The dB per octave slope determines how sharply the response of the crossover will roll off after the crossover frequency. An octave is a doubling, or halving of frequency, for example 250Hz to 500Hz is one octave.

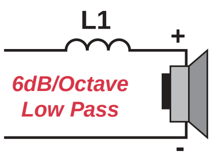
Formulae for calculating crossover components

$$L = \frac{R}{2\pi f} \qquad C = \frac{1}{2\pi f R}$$

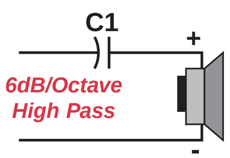
Where..

R = Speaker impedance (Ω)
f = Crossover frequency (Hz)
π = pi = ≈3.141592654
C = Capacitance
L = Inductance

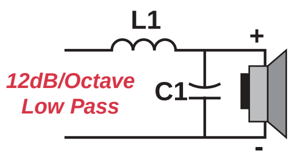




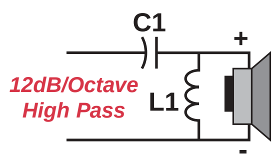
6dB/Octave Low Pass



6dB/Octave High Pass



12dB/Octave Low Pass



12dB/Octave High Pass

6dB Per Octave Crossover Chart

Crossover Frequency	2Ω		4Ω		8Ω	
	L	C	L	C	L	C
80	4.1mH	1000µF	8.2mH	500µF	16mH	250µF
100	3.1mH	800µF	6.2mH	400µF	12mH	200µF
125	2.5mH	640µF	5mH	320µF	10mH	160µF
150	2.0mH	530µF	4mH	260µF	9mH	130µF
200	1.6mH	400µF	3.5mH	200µF	6.8mH	100µF
260	1.2mH	300µF	2.5mH	150µF	5mH	75µF
400	.8mH	200µF	1.6mH	100µF	3.3mH	50µF
600	.5mH	140µF	1.0mH	70µF	2.0mH	35µF
800	.4mH	100µF	.8mH	50µF	1.6mH	25µF
1000	.3mH	80µF	.6mH	40µF	1.2mH	20µF
1500	.2mH	50µF	.4mH	25µF	.8mH	13µF
2000	.15mH	40µF	.3mH	20µF	.6mH	10µF
3000	.1mH	25µF	.2mH	13µF	.4mH	6.6µF
4000	.08mH	20µF	.15mH	10µF	.3mH	5µF
5000	.06mH	16µF	.12mH	8µF	.25mH	4µF
6000	.05mH	13µF	.1mH	6.6µF	.2mH	3.3µF
8000	.04mH	10µF	.08mH	5µF	.16mH	2.5µF
10000	.03mH	8µF	.06mH	4µF	.12mH	2µF

12dB Per Octave Crossover Chart

Crossover Frequency	2Ω		4Ω		8Ω	
	L	C	L	C	L	C
80	5.6mH	700µF	11mH	330µF	22.0mH	180µF
100	4.5mH	550µF	9.0mH	270µF	18.0mH	135µF
125	3.5mH	450µF	7.0mH	220µF	14.0mH	110µF
150	3.0mH	375µF	6.0mH	180µF	12.0mH	90µF
200	2.3mH	281µF	4.5mH	140µF	9.0mH	70µF
260	1.7mH	220µF	3.5mH	100µF	7.0mH	50µF
400	1.1mH	140µF	2.2mH	70µF	4.5mH	35µF
600	.75mH	100µF	1.5mH	50µF	3.0mH	25µF
800	.56mH	68µF	1.0mH	33µF	2.0mH	15µF
1000	.45mH	55µF	.9mH	27µF	1.8mH	13µF
1500	.3mH	36µF	.6mH	18µF	1.2mH	10µF
2000	.22mH	28µF	.5mH	14µF	.9mH	7µF
3000	.15mH	19µF	.3mH	10µF	.6mH	4.6µF
4000	.11mH	14µF	.225mH	7µF	.45mH	3.5µF
5000	.09mH	10µF	.18mH	5.6µF	.36mH	2.8µF
6000	.075mH	9.3µF	.15mH	4.6µF	.3mH	2.3µF
8000	.056mH	7µF	.11mH	3.5µF	.25mH	1.7µF
10000	.045mH	5.6µF	.09mH	2.8µF	.18mH	1.4µF

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