VXi: Crossovers

JL AUDIO | Help Center

A few definitions of crossover terms:

High-Pass Filter: uniformly allows signals to pass above a certain frequency. Below that frequency, signal levels are attenuated at a gradual rate, defined by the Filter Slope.

Low-Pass Filter: uniformly allows signals to pass below a certain frequency. Above that frequency, signal levels are attenuated at a gradual rate, defined by the Filter Slope.

Bandpass Filter: uniformly passes signal above a certain frequency and below another frequency. A bandpass filter is created by combining, in series, a high pass filter and a low pass filter on the same signal

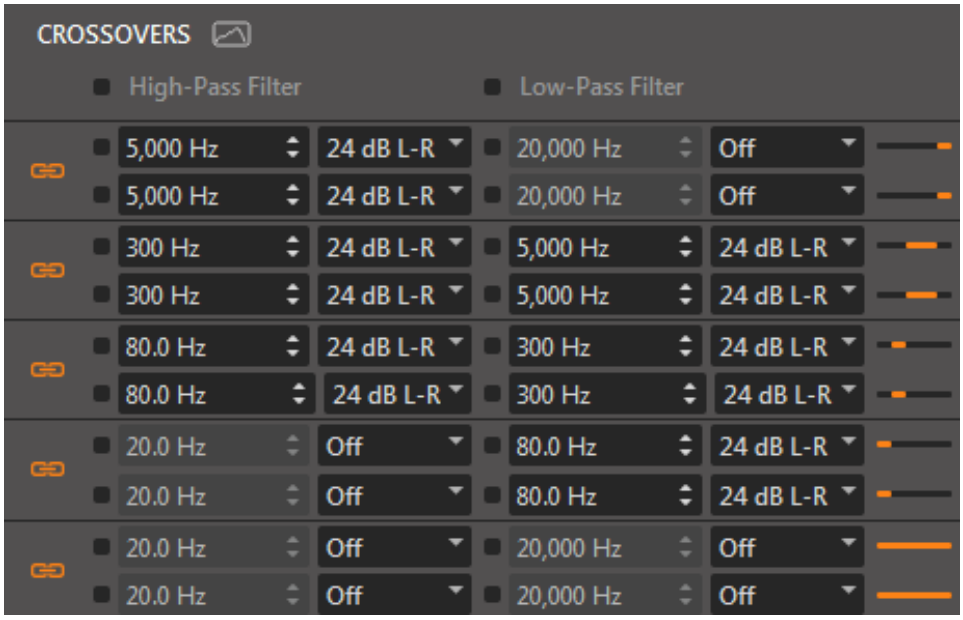
Filter Alignment: determines the theoretical behavior of the crossover (combination of signals) created between a low-pass filtered signal and a high-pass filtered signal, assuming that both filters are of the same slope and alignment. For most tuning purposes, Linkwitz-Riley is the best choice.

Passband: the range of frequencies uniformly passed by a filter. Defined by two frequencies.

Stopband: the range, or ranges of frequencies outside the passband.

VXi amplifiers include independent, fully adjustable High-Pass and Low-Pass crossovers for each output channel. When using the TüN's Setup Tool, High-Pass, Low-Pass and Band-Pass (combination of HPF and LPF) filters are automatically set to recommended frequencies and slopes. If desired, the initial crossover frequencies and slopes can be adjusted during the tuning process. For an explanation of crossovers, read The Understanding Crossovers Article.

The following Crossover controls are available for each Output Channel of the VXi amplifiers. Each VXi amplifier also gives you the option to set up a crossover for the pre amp output section.



The TüN™ software provides separate controls for adjusting a High-Pass Filter and a Low-Pass Filter on each Output Channel. These can be combined to create a Bandpass Filter. Each filter section contains the following controls:

Frequency: allows adjustment of the filter frequency (in Hz) via direct numerical entry with the keyboard, or incrementally via the arrows located next to the displayed value. Holding “Shift” down when clicking results in finer resolution steps.

Slope: A pull-down menu allows selection of crossover slopes and filter alignment from a list of available choices:

12, 24 or 48 dB/octave, Linkwitz-Riley (L-R), plus 6 dB/octave and 12, 18, 24, 36, 48 dB/octave, Butterworth alignment (BW)

Here are some basic guidelines for setting filter frequencies and good starting frequencies for tuning a system (use 24 dB/octave L-R slope):

2-way System:

1. Coaxial/Component System with passive crossover between woofer and tweeter: 80 Hz High-Pass
2. Subwoofer: 80 Hz Low-Pass

3-way System:

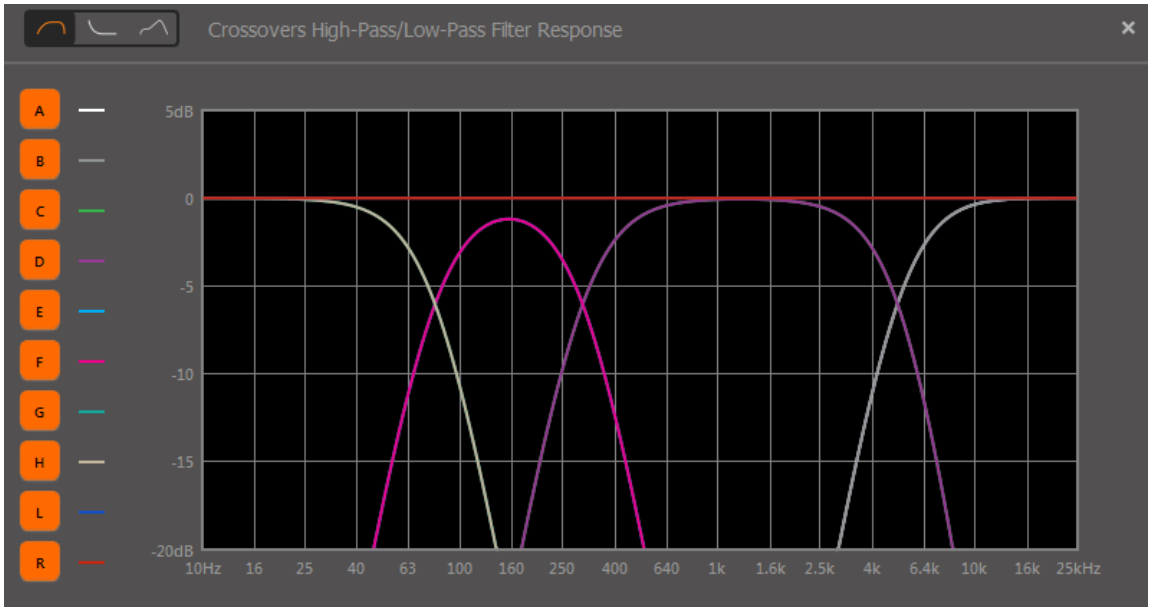
1. Tweeter: 5000 Hz High-Pass
2. Component woofer: 80 Hz – 5000 Hz Bandpass
3. Subwoofer: 80 Hz Low-Pass

4-way System:

1. Tweeter: 5000 Hz High-Pass
2. Midrange: 500 Hz – 5000 Hz Bandpass
3. Midbass: 80 Hz – 500 Hz Bandpass
4. Subwoofer: 80 Hz Low-Pass

Passband Bar display: shows, at a glance, the approximate passband (bandwidth) of the signal on each channel, based on the crossover frequencies that have been selected. Clicking on the Passband Bar Display will open a window with a large, detailed view of the crossover filter’s response. Once this window is open, you can show and hide channels to evaluate the crossover settings. The detailed crossover response view can also be called up by clicking on the Crossover menu

Clicking the  icon next to the CROSSOVERS label at the top of the crossover section provides a detailed view of the entire system showing all crossovers and their actions. Channels can be removed or added depending on the view desired.


Crossovers High-Pass/Low-Pass Filter Response
A
B
C
D
E
F
G
H
L
R
5dB
0
-5
-10
-15
-20dB
10Hz
16
25
40
63
100
160
250
400
640
1k
1.6k
2.5k
4k
6.4k
10k
16k
25kHz