

Recommended crossover and filter settings

Christie Vive Audio systems are designed to use specialized crossover and filter settings for operation in two-way bi-amplified, three-way tri-amplified, low frequency effects (LFE), surround high pass filter, or bass management modes.

Use the following crossover and filter settings to ensure that your system is optimally configured.

Precautions

Keep the following points in mind when selecting the crossover and protection filter settings.

- Do not use any crossover or filter settings other than those listed, to avoid sub-optimal performance and damage to equipment.
- Vive Audio subwoofers feature a vented box design, with extended bass shelf (EBS) tuning. You must use a high pass protection filter, as specified in this document, to avoid operating below enclosure tuning frequency and damaging drivers from over-excursion.
- When tuning a system, we recommend performing bulk equalization at the crossover, balancing speaker and subwoofer output level to achieve the flattest response for the environment and before any other equalization is applied to system.

Recommended crossover specifications

Use these specifications when selecting an electronic crossover/processor.

Specifications

Specification	Description
Filter types	Butterworth, Bessel and Linkwitz-Riley with a 24 dB/octave slope
Signal-to-noise ratio	105 dB (minimum), 115dB (optimal)
24 bit converters	48 kHz sample rate (minimum), 96 kHz (optimal)
Inputs/outputs	Suitable number for speaker system configuration

Recommended crossover units

- Peavey Digitool Live

- Peavey Digitool MX16
- Peavey Digitool MX32
- DBX DriveRack PA+
- DBX DriveRack PA1
- DBX DriveRack 260

Recommended processors with internal crossover function included

- Dolby CP850 Atmos
- Dolby CP850 Base

LA series crossover settings

Select from the following crossover and filter settings for the LA series of speakers, depending on your system and application.

- **Bi-amped**—LA1, LA2, LA3, LA4 + S115 or S215
- **Tri-amped**—LA5 + (2) S215

Bi-amp settings

Low frequency crossover for subwoofer	High frequency crossover for speaker	Relative level between speaker and subwoofer
Subwoofers: S115 or S215 High pass filter: 4th order 24dB/octave Butterworth at 25Hz Low pass filter: 24 dB/octave Bessel at 209Hz	Speakers: LA1, LA2, LA3, LA4 High pass filter: 24 dB/octave Bessel at 111Hz Low pass filter: Off (equal to 20 kHz on Digitool)	Relative levels between speaker and subwoofer at electronic crossover outputs, as a starting point, before any bulk equalization adjustments are made: <ul style="list-style-type: none"> • LA1 at 0 dB, with S115 at 0 dB • LA2 at 0 dB, with S215 at -4 dB • LA3 at 0 dB, with S215 at -4 dB • LA4 at 0 dB, with S215 at 0 dB

For bi-amp systems, adjust the balance of low and high frequency crossover output levels to achieve the flattest response for the audio system and environment before using any other equalization.

Tri-amp settings

Low frequency crossover for subwoofer	Mid-frequency crossover for speakers	High-frequency crossover for speakers	Relative level/delay between speaker and subwoofer
Subwoofers: (2) S215 High pass filter: 24dB/octave Butterworth at 25Hz	Speaker: LA5 mid-input High pass filter: 24 dB/octave Bessel at 111Hz Low pass filter: 24 dB/octave L-R at 1.5kHz	Speaker: LA5 high input High pass filter: 24 dB/octave L-R at 1.5 kHz Low pass filter: Off (equal to 20 kHz on Digitool)	Relative levels between speaker and subwoofers at electronic crossover outputs, as a starting point, before any bulk

Low frequency crossover for subwoofer	Mid-frequency crossover for speakers	High-frequency crossover for speakers	Relative level/delay between speaker and subwoofer
Low pass filter: 24 dB/octave Bessel at 209Hz			equalization adjustments are made: <ul style="list-style-type: none"> • LA5 HF at 0 dB, 0.2 ms delay • LA5 MF at 0 dB, 0 ms delay • (2) S215 at -3 dB, 0 ms delay

For tri-amp systems, adjust the balance of low, mid and high frequency crossover output levels to achieve the flattest response for the audio system and environment before using any other equalization.

LS series crossover settings

Select from the following crossover and filter settings for the LS series of speakers.

- **Bi-amped**—LS1, LS2

Speaker	Low frequency crossover	High frequency crossover	Relative level between speaker frequencies
LS1	High pass filter: 24 dB/octave Butterworth at 30 Hz Low pass filter: 24 dB/octave Butterworth at 350 Hz	High pass filter: 24 dB/octave L-R at 350 Hz Low pass filter: None	LF: 0 dB MF/HF: -2 dB to -4 dB
LS2	High pass filter: 24 dB/octave Butterworth at 25 Hz Low pass filter: 24 dB/octave Butterworth at 350 Hz	High pass filter: 24 dB/octave L-R at 350 Hz Low pass filter: None	LF: 0 dB MF/HF: -1 dB to -3 dB

Low frequency effects filter settings

For Low frequency effects (LFE) systems, use an in-band real-time analyzer method per SMPTE RP200 specifications.

High pass and low pass filter for LFE subwoofer	Relative level between LFE subwoofer and speaker
Subwoofers: S118 or S218 High pass filter: 24 dB/octave Butterworth at 20 Hz Low Pass Filter: 24 dB/octave Bessel at 249 Hz	Per SMPTE RP200 specifications, LFE channel sound pressure level (SPL): +10 dB above SPL of center channel, measured in-band on a real-time analyzer, SPL C weighted/slow response, at standard 2/3 room length reference, after level/equalization adjustments are made.

High pass and low pass filter for LFE subwoofer	Relative level between LFE subwoofer and speaker
	Approximately equal to LFE Channel SPL: +5 to +6 dB above SPL of center channel, measured broadband, SPL meter, C weighted/slow response, at standard 2/3 room length reference, after level/equalization adjustments are made.

Surround bass management crossover settings

For bass managed surround systems, adjust the balance of low and high frequency crossover output levels to achieve the flattest response for audio system and environment, before using any other equalization. The exception is Dolby Atmos surround systems, which do this automatically.

Speaker series	Low frequency crossover for subwoofer	High frequency crossover for speaker
LA and LS	Subwoofers: S115 or S215 High pass filter: 24 dB/octave Butterworth at 25 Hz Low pass filter: 24 dB/octave Butterworth at 80 Hz	Speakers: LA3S, LA3C, LA4S, LA4C, LA5S, LS1S, LS2S, LS3S, LS4S, and LS5S High pass filter: 24 dB/octave Butterworth at 80 Hz Low pass filter: Off (equal to 20 kHz on Digitool)

Adjust the relative level of the speaker and subwoofer for the flattest response for the audio system and environment that it is installed in.

For all Dolby Atmos system installations, the relative level between speaker and subwoofer is set automatically by the Dolby provided calibration system.

In general, a subwoofer provides approximately +2.5 dB to +3 dB SPL of additional output used with a surround speaker in a system.

Surround high pass filter settings (optional)

The LA series and LS series surround speakers can be used with full range input signals, or with bass management.

However, when bass management is not used, we recommend using an optional high pass filter for optimal efficiency and performance.

Speakers	High pass filter	Low pass filter
LA3S, LA3C, LA4S, LA4C, LA5S and LA5C, as well as LS1S, LS2S, LS3S, LS4S, and LS5S	24 dB/octave Butterworth at 40 Hz	None

Technical support

Technical support for Christie products is available at:

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