Vive Audio Line Array Speaker System Equalization Guidelines

Vive Audio line array speaker systems require a different equalization process than point source speaker systems, as they have different acoustic performance characteristics.

Setting up for audio system equalization

Before starting the audio system equalization process, complete all of the following setup procedures.

1. Set all amplifier gain controls to nominal settings, as detailed in the *Nominal Amplifier Gain Control Settings Instruction Sheet (020-101655-XX)*.

2. Install and laser align all speakers, as detailed in the *Vive Audio Line Array and Line Source Laser Alignment Procedures Instruction Sheet (020-101406-XX)*.

3. Set up the electronic crossover and filters and perform bulk equalization at the crossover, as detailed in the *Recommended Crossover Settings Instruction Sheet (020-101405-XX)*.

Audio system equalization guidelines

After the setup process is complete, use the following guidelines when equalizing the audio system.

Compensate for high frequency losses

When line array speakers are placed behind a perforated projection screen, (for example, cinema screen channels speakers) you need to compensate for high frequency losses due to sound waves interacting with screen. Apply boost only equalization using the following approximate values as baselines.

Screen type	10 kHz	12.5 kHz	16 kHz
White micro perforated screen	+1.0 dB	+2.0 dB	+3.0 dB
Silver micro perforated screen	+1.5 dB	+2.5 dB	+3.5 dB

Screen type	10 kHz	12.5 kHz	16 kHz
White standard perforated screen	+1.5 dB	+2.5 dB	+3.5 dB
Silver standard perforated screen	+2.0 dB	+3.0 dB	+4.0 dB
White mini perforated screen	+2.5 dB	+3.5 dB	+4.5 dB
Silver mini perforated screen	+3.0 dB	+4.0 dB	+5.0 dB

The high frequency response of the system (approximately 4 kHz–20 kHz) when viewed on an Real Time Analyzer (RTA) may be below standard X-Curve tolerance (SMPTE ST 202:2010 and ISO 2969), even after screen loss compensation is applied. This is normal for Vive Audio line array systems in cinema environments.

Equalizing the high frequency response of Vive Audio line array systems to conform to standard X-Curve tolerance when viewed on an RTA, or using an automatic equalization function, typically results in very harsh and shrill sound due to excessive boost at high frequencies.

Control room modes

Control any room modes at low frequencies (approximately 20 Hz–160 kHz) by using minimal cut only equalization. Smooth out any bumps in low frequency response so it mirrors, or is even a bit above, the X-Curve tolerance when viewed on an RTA.

The signature of a room mode being controlled; once the fundamental frequency of a room mode is cut then any harmonics (at multiples of said fundamental) will also drop in response to a cut.

Compensate for non-linearity

Compensate for any non-linearity at mid-frequencies (approximately 160 Hz–4 kHz) introduced by interaction of sound waves with perforated projection screen and other environmental factors. Use minimal cut or boost equalization as needed for mid frequency response to be within X-Curve tolerance when viewed on an RTA. Ensure it sounds correct by listening to familiar content with dialogue elements, then fine tune equalization as required.
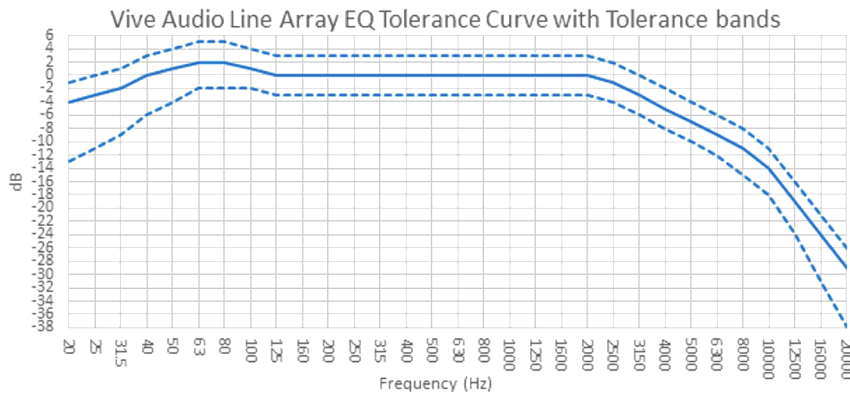
Target curves

Use the following curve graphs as a reference when completing the equalization activities.

- **X-Curve**: developed for point source systems in cinema (SMPTE ST 202:2010 and ISO 2969)
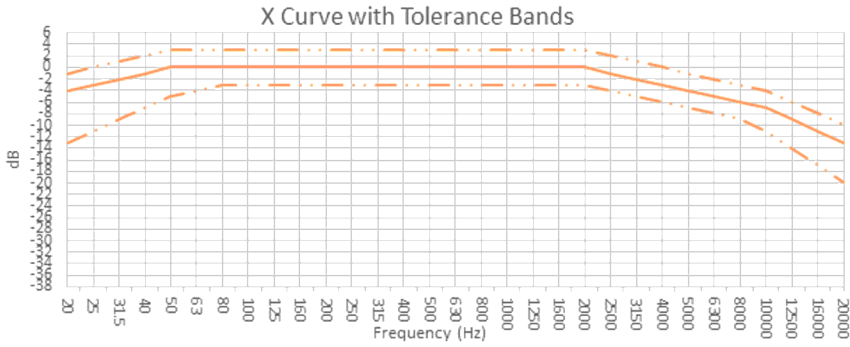
- **Vive Audio line array target curve**: developed for response of line array systems in cinema

- **Overlay of X-Curve and Vive Audio curve**: illustrates differences in response between the two curves