



JBL

PROFESSIONAL

VTX SERIES
SYSTEM SOLUTIONS

A12 | User Manual



GENERAL INFORMATION

A12 - User Manual

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JBL PROFESSIONAL

8500 Balboa Blvd

Northridge, CA 91329

USA

Thank you for purchasing JBL VTX Series products



Of all the achievements JBL has made over the years, the VTX Series stands as a milestone in the practical application of creative engineering. The next generation in line arrays, VTX heralds a new era in performance, system integration and user friendliness. Supported by multiple patents in driver, waveguide and suspension technology, VTX is also supported by technologies from HARMAN Professional sister companies for amplification, DSP, control and system management. In addition to high-performance components, VTX is backed by JBL's engineering support — the human factor and technical tools that are key to the proper specification and configuration of the VTX system in any venue, anywhere in the world.

The VTX Series is a result of JBL's continued effort to deliver more powerful, more compact, lightweight and flexible sound reinforcement systems. Designed for portable and fixed-venue system operators alike, VTX features JBL's legendary sound quality coupled with the most advanced sound reinforcement technology and support available. As a member of the Harman group, we draw from the expertise and integration of the entire range of Harman Pro audio technologies. So, in addition to the best sound possible, VTX offers efficient and intuitive setup, tuning, networking and control to provide a truly professional and advanced system solution.

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1 - DECLARATION OF CONFORMITY

BRAND: JBL Professional

FAMILY NAME: VTX A12 loudspeaker and suspension accessories

MODEL NAMES:

- VTX A12
- VTX A12 AF
- VTX A12 AF EB
- VTX A12 SB
- VTX A12 VT GND
- VTX Delta

We, **HARMAN International**, declare under our sole responsibility that the product, to which this declaration relates, is in conformity with the following standards:

STANDARD	DESCRIPTION	TEST AGENCY
2006/42/EC MACHINE DIRECTIVE	Applies to machinery and lays down essential health and safety requirements ISO12100	Tested at JBL Professional
2014/35/EC LOW VOLTAGE DIRECTIVE	Applies to loudspeaker and lays down essential health and safety requirements. EN60065	Tested at JBL Professional

Frank Lacelle

Compliance Manager - Harman International

2 - SAFETY

Before using a JBL VTX Series system, please review the following for important information on safety and protection of your investment.

2.2 - SAFETY INSTRUCTIONS

1. Read these instructions
2. Keep these instructions
3. Heed all warnings
4. Follow all instructions
5. Do not expose the product to direct rain or sea spray
6. Clean only with a dry cloth
7. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat
8. Only use attachments / accessories specified by the manufacturer
9. Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart / apparatus combination to avoid injury from tip-over
10. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped
11. Contact JBL Professional for advanced servicing issues
12. CAUTION - DO NOT PERFORM ANY SERVICING UNLESS YOU ARE QUALIFIED TO DO SO
13. **Prolonged exposure to excessive SPL can cause hearing damage:** the loudspeaker is easily capable of generating sound pressure levels (SPL) sufficient to cause permanent hearing damage to performers, production crew and audience members. Caution should be taken to avoid prolonged exposure to SPL in excess of 90 dB
14. Read the System Rigging Manual before installation and use of the product

2.2 - GENERAL HARDWARE INFORMATION

Any hardware used in an overhead suspension application must be load rated for the intended use. Generally, this type of hardware is available from rigging supply houses, industrial supply catalogs and specialized rigging distributors. Local hardware stores do not usually stock these products. Hardware that is intended for overhead suspension will comply with ASME B30.20 and will be manufactured under product traceability controls. Compliant hardware will be referenced with a working load limit (WLL) and a traceability code.

2.3 - IMPORTANT SAFETY WARNING

The information in this section has been assembled from recognized engineering data and is intended for informational purposes only. None of the information in this section should be used without first obtaining competent advice with respect to applicability to a given circumstance. None of the information presented herein is intended as a representation or warranty on the part of JBL. Anyone making use of this information assumes all liability arising from such use.

All information presented herein is based upon materials and practices common to North America and may not directly apply to other countries because of differing material dimensions, specifications, and/or local regulations. Users in other countries should consult with appropriate engineering and regulatory authorities for specific guidelines.

Correct use of all included hardware is required for secure system suspension. Careful calculations should always be performed to ensure that all components are used within their working load limits before the array is suspended. Never exceed the maximum recommended load ratings.

Before suspending any speaker system always inspect all components (enclosure, rigging frames, pins, eyebolts, track fittings, etc.) for cracks, deformations, corrosion, or missing/loose/damaged parts that could reduce strength and safety of the array. Do not suspend the speaker until the proper corrective action has been taken. Use only load-rated hardware when suspending JBL suspendable loudspeaker models.

2.4 - ATTACHMENT TO STRUCTURES

A licensed Professional Engineer must approve the placement and method of attachment to the structure prior to the installation of any overhead object. The following performance standards should be provided to the Professional Engineer for design purposes: Uniform Building Code as applicable, Municipal Building Code as applicable, and Seismic Code as applicable. The installation of the hardware and method of attachment must be carried out in the manner specified by the Professional Engineer. Improper installation may result in damage, injury or death.

2.5 - INSPECTION AND MAINTENANCE

Suspension systems are comprised of mechanical devices and, as such, they require regular inspection and routine maintenance to ensure proper functionality. Before suspending or pole mounting any speaker system, always inspect all components (enclosure, suspension frames or brackets, pins, eyebolts, etc.) for cracks, deformations, corrosion, or missing/loose/damaged parts that could reduce strength and safety of the array. Do not suspend or pole mount the speaker until the proper corrective action has been taken.

Installed systems should be inspected at least annually. The inspection shall include a visual survey of all corners and load-bearing surfaces for signs of cracking, water damage, de-lamination, or any other condition that may decrease the strength of the loudspeaker enclosure.

Accessory suspension hardware provided with or for VTX systems must be inspected for fatigue at least annually or as required by local ordinance. The inspection shall include a visual survey of the material for signs of corrosion, bending or any other condition that may decrease the strength of the fastener. Additionally, any eyebolts shall be checked for possible spin-out of the enclosure.

For all other hardware and fittings, refer to the hardware manufacturer's inspection and maintenance guidelines for process.

JBL is not responsible for the application of its products for any purpose or the misuse of this information for any purpose. Furthermore, JBL is not responsible for the abuse of its products caused by avoiding compliance with inspection and maintenance procedures or any other abuse.

Prior to suspending the system, an expert, trained and experienced in suspending speaker systems, should inspect all parts and components.

2.6 - SYMBOLS

The following set of symbols are used in this document:



CAUTION: This symbol gives notice of a potential risk of harm to the individual or the equipment. Instruction marked with this symbol must be strictly followed.



TIP: This symbol gives notice of helpful, relevant information about the topic.

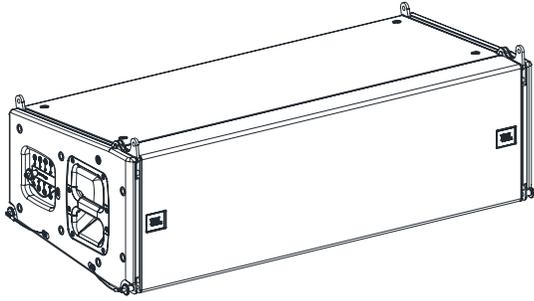


INSTRUCTIONS: This symbol gives notice of instructions that must be followed for proper installation and use of the product.

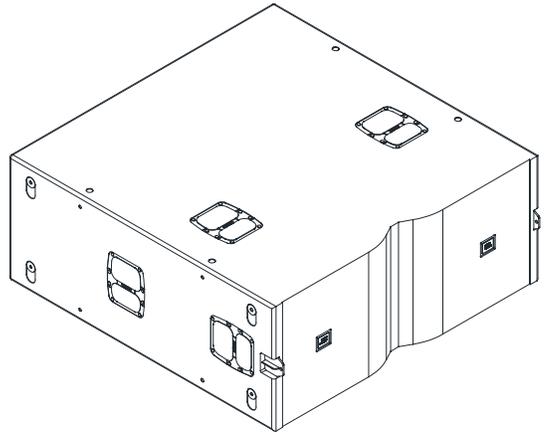


TOOLS REQUIRED: This symbol gives notice of tools that must be used for proper installation and use of the product.

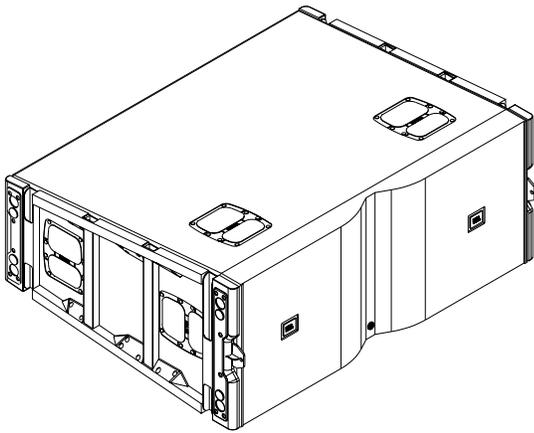
3 - SYSTEM COMPONENTS



VTX A12



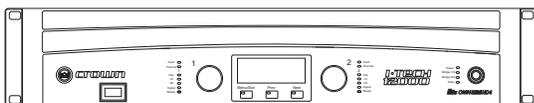
VTX G28



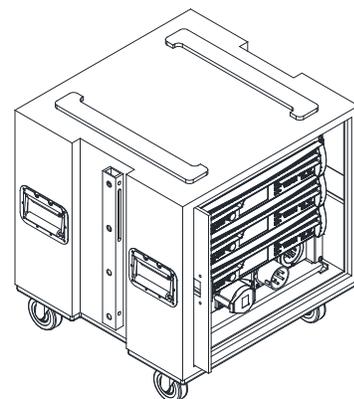
VTX S28



Crown I-Tech 4x3500HD



Crown I-Tech 12000HD



Crown Audio V-Rack

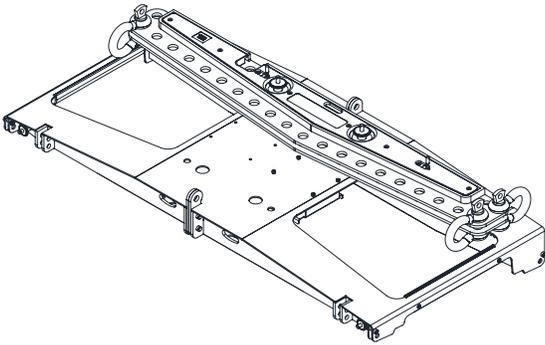
4 - COMPATIBLE ACCESSORIES

For more information on the accessories, refer to the accessory specification sheets. For more information on usage, refer to the VTX A12 Rigging Manual available at www.jblpro.com.



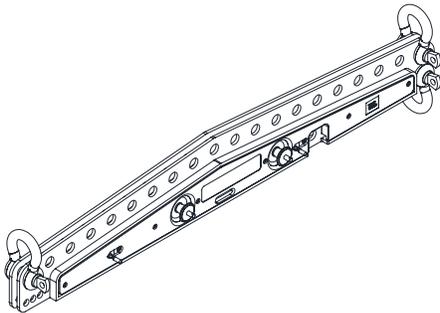
CAUTION: Always use components and accessories specified and approved by JBL Professional. When a cart is used, use caution when moving the cart to avoid injury from tip-over.

4.1 - VTX A12 AF - ARRAY FRAME



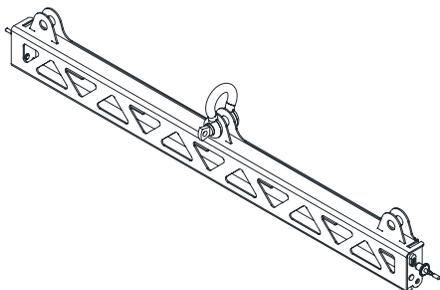
- Array Frame for suspending VTX A12 enclosures
- 1 x Extension Bar included
- Built-in storage position for Extension Bar
- Single, front-to-back and side-by-side suspension points
- High-resolution single-point selection
- Support for up to 24 x VTX A12 (array geometry dependent)
- Included laser bracket for JBL VTX LZ, LAP-TEP and Recline

4.2 - VTX A12 AF EB - ARRAY FRAME EXTENSION BAR



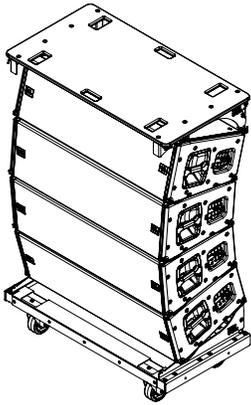
- Extension Bar for use with the VTX A12 AF
- 2 x Extension Bar can be used for side-by-side suspension
- Support for up to 24 x VTX A12 (array geometry dependent)
- 3 x CM 5/8" Shackles included
- Lightweight design

4.3 - VTX A12 SB - SUSPENSION BAR



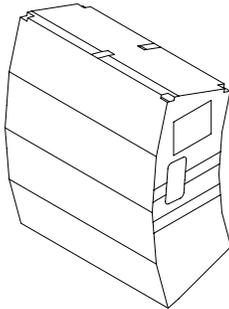
- Compact suspension bar for VTX A12
- Connects to the top or bottom cabinet of an array
- Used to implement pull-back
- Used for suspending VTX A12 enclosures
- Support for up to 18 x VTX A12
- Lightweight design

4.4 - VTX A12 VT - VERTICAL TRANSPORT CART



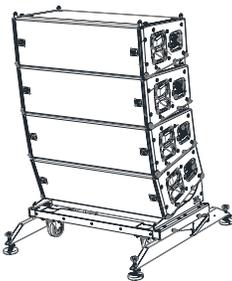
- Vertical Transport cart for 4 x VTX A12
- Truck-pack friendly dimensions
- Hard top included for easy stacking and transportation
- Built-in stacking features for easy storage
- Ground stacking support with optional accessory
- Heavy-duty casters
- Constructed from steel and aluminum parts

4.5 - VTX A12 VT CVR - SOFT COVER



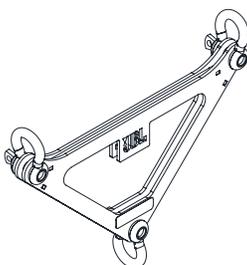
- Heavy-duty cover for 4 x VTX A12 enclosures
- Includes input panel access flaps for easy testing
- Clear see-through pocket for shipping labels
- Handle cutouts for easy transportation
- Padded front section for grill protection
- Industrial-grade zippers
- Folds and stores in the VTX A12 VT

4.6 - VTX A12 VT GND - GROUND STACK KIT (PRELIMINARY)



- Outrigger system for ground stacking VTX A12
- Support for up to 6 x VTX A12 enclosures
- 4 x screw jacks are included for adjusting height
- Zero-gravity angle set hinge system
- Range: -15 to +5 degrees
- Connects to VTX A12 VT

4.7 - VTX DELTA - DELTA PLATE

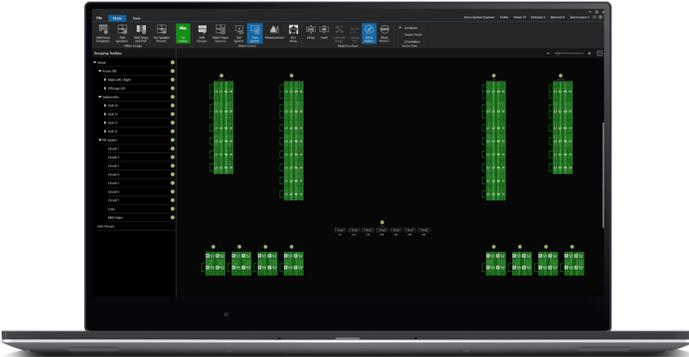


- Universal delta plate accessory for VTX systems
- Support for up to 24 x VTX enclosures
- Allows for +/- 10 degree horizontal adjustments
- Includes 3 x 5/8" shackles
- Recommended horizontal point spacing: 1 meter (3.3')
- Working Load Limit: 2,177kg (4,800lbs)

5 - SOFTWARE

5.1 - PERFORMANCE MANAGER™

JBL® Performance Manager™ is a software application designed to configure and control networked audio systems. The workflow paradigm of the Performance Manager interface guides the system designer through the complete system design, configuration and control process. A dedicated show mode provides all the monitoring and control needed to have a complete picture of how the system is performing in real time.



5.2 - LINE ARRAY CALCULATOR 3™

LAC is a simulation software for designing and predicting JBL VTX Series systems. LAC predicts the acoustical performance of Line Array systems as well as flown and ground stacked subwoofer arrays. Subwoofer delay values can be generated for electronic delay steering (EDS) using the built-in coverage calculator. Beyond the acoustical prediction, LAC is used for mechanical validation of all used hardware and calculating weight limits and safety warnings.



5.3 - ARRAY LINK™

JBL Array Link is a mobile companion app that works in conjunction with JBL's LAC software to assist with deploying JBL VTX Series systems. Array Link uses a QR code system to transfer all mechanical array information from the main LAC application to a mobile phone. All relevant rigging and mechanical options are presented in an easy-to-understand layout. The application is compatible with iOS® and Android™ and can be obtained from the respective app stores.



6 - VTX A12 INTRODUCTION



Next-gen JBL loudspeaker technology

Completely rebuilt acoustic components for best-in-class SPL output and 90-degree directivity down to 250 Hz

New highs, mids and lows

All-new high, mid and low frequency designs and components provide better tolerances, reduced distortion, and increased power handling

Fast rigging

Quicker deployment with redesigned suspension system and patented internal locking mechanism for up to 1/4-degree increment settings

Lightweight truck-friendliness

Lightest-in-class, completely redesigned frame with truck-friendly dimensions

JBL VTX A12 is a complete tour sound solution for mid- to large-size touring applications and high-end fixed installations. VTX A12 was designed from scratch to address the unique challenges of rental companies, FOH engineers and tour sound production crews. Next-generation JBL transducer technology and a high-frequency waveguide design deliver unmatched performance, sensitivity and coverage. A patented JBL rigging mechanism and redesigned suspension system streamline deployment and setup. And refinements to the physical design maximize reliability and versatility, while minimizing size and dramatically reducing weight. VTX A12 isn't just a superior line array—it's a completely new way to approach tour sound.

KEY MESSAGES

PERFORMANCE

JBL Professional is the world's leading manufacturer of loudspeaker systems, using custom designed and built drivers for optimal performance.

VTX A12's new **high-frequency** (HF) section features three uniquely designed drivers that combine the HF phasing-plug and waveguide into one part, which helps provide better tolerances and increased sensitivity above 6 kHz, while reducing distortion and overall weight.

Its **all-new patented JBL Radiation Boundary Integrator** combines four 5.5" mid-frequency drivers into the high-frequency waveguide—providing a smooth horn surface for the high-frequency section.

A lightweight 12" low-frequency woofer (LF) features a 4th generation Differential Drive design, a **new dual voice coil, dual magnet** and a host of proprietary JBL technologies for increased excursion, power handling and sensitivity.

INNOVATIVE RIGGING

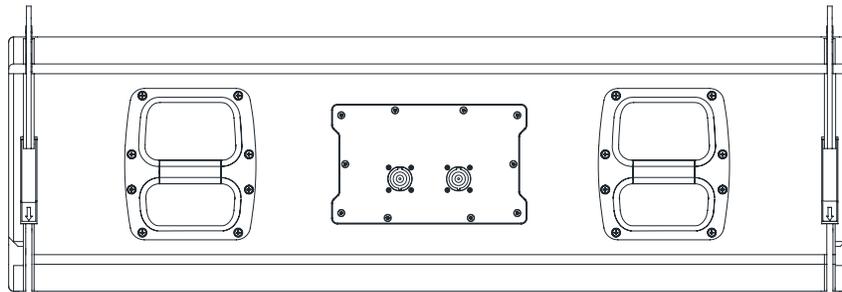
VTX A12 marks a giant leap forward in how the loudspeakers are rigged and transported. To facilitate quicker deployment, array elements are stacked four per vertical transporter cart in a 10-degree collapsed position. A patented internal locking mechanism makes it easy to set arrays at up to 1/4-degree increments using selector pins.

ACCESSORIES

The completely redesigned VTX A12 Array Frame is the lightest in its class. At 41 kg. (90 lbs) the lightweight frame allows the system to be deployed in a variety of use cases and venues. Both the cart and frame were purposefully engineered to meet both U.S. and European truck pack dimensions to help production companies transport the system more effectively.

7 - VTX A12 CONNECTIONS

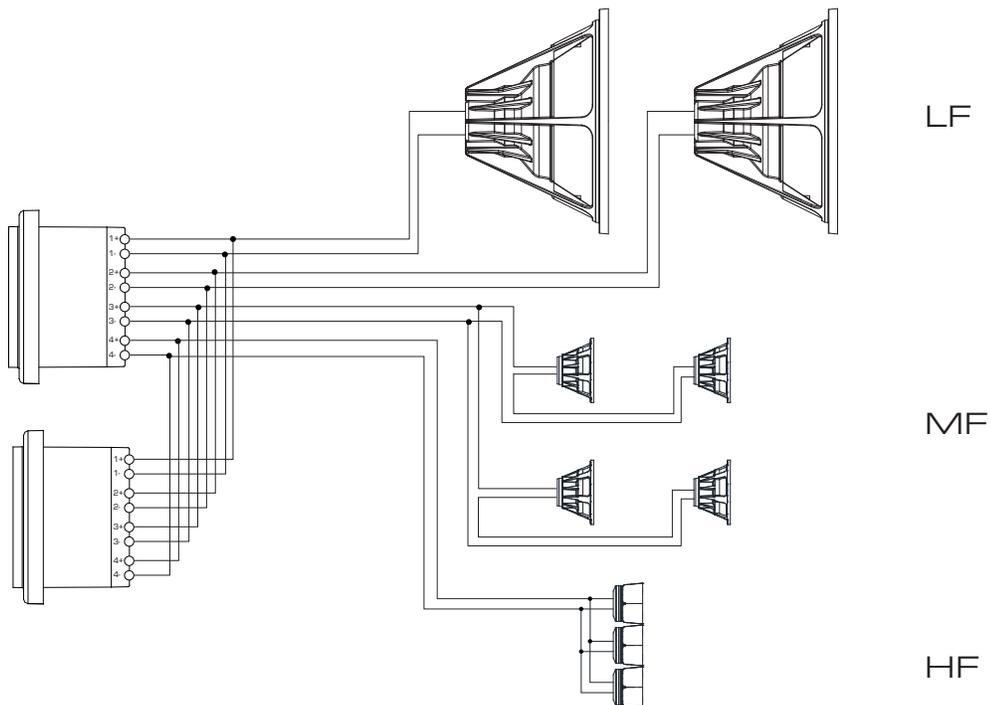
The JBL VTX A12 is equipped with two Neutrik NL8 SpeakON connectors. Both NL8 connectors are wired in parallel and can be used as the system input or as a through connection for daisy-chaining multiple cabinets together. The A12 NL8 connectors are installed upside down so that the NL8 locking pin position can be seen from under the array.



VTX A12 internal NL8 pinout

NL8 Pin	Pin 1 +/-	Pin 2 +/-	Pin 3 +/-	Pin 4 +/-
Transducers	A12 LF Left	A12 LF Right	A12 MF	A12 HF

7.1 - VTX A12 INTERNAL WIRING



CAUTION: Always use high-quality insulated speaker cables made by reputable manufacturers. Keep cable length as short as possible with sufficient gauge for the application.

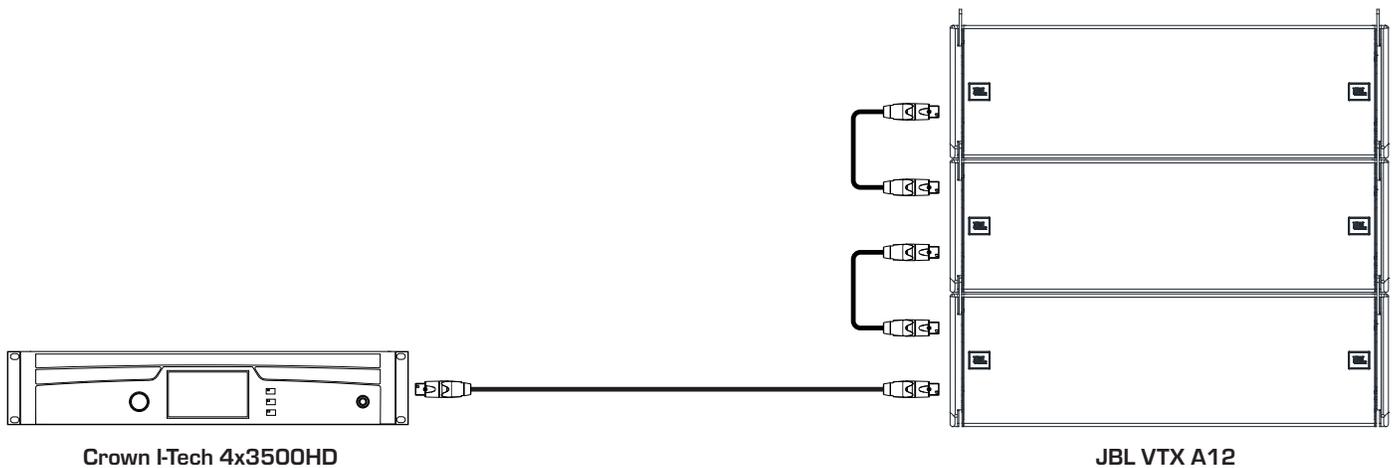
8 - SYSTEM AMPLIFICATION

Like all other VTX systems, the VTX A12 is powered exclusively by Crown I-Tech HD amplifiers, providing optimum performance and consistency across the world. The Crown I-Tech HD series amplifiers feature BSS Audio OMNIDRIVEHD™ processing for each amplifier channel, including the acclaimed LevelMAX™ Limiter Suite and support for linear-phase FIR filters. All VTX A12 processing is done using I-Tech HD internal processing and no other external DSP is required. The Crown amplifiers include a user-adjustable input section for room correction equalization, array size compensation and circuit adjustments.

Standard JBL VTX A12 presets are available for both the Crown I-Tech 4x3500HD and Crown I-Tech 12000HD. The most up-to-date presets are available for download from the www.jblpro.com website and are always bundled in the latest version of JBL's Performance Manager™ control software.

8.1 - CROWN I-TECH 4X3500HD

When using Crown Audio I-Tech 4x3500HD amplifiers, up to 3 VTX A12 loudspeakers can be powered per amplifier. Based on the A12 component resource requirements, this allows for optimum power-to-transducer ratio without compromising the maximum SPL capabilities of the system. Circuits of 2 cabinets can be used when higher circuiting resolution is necessary.

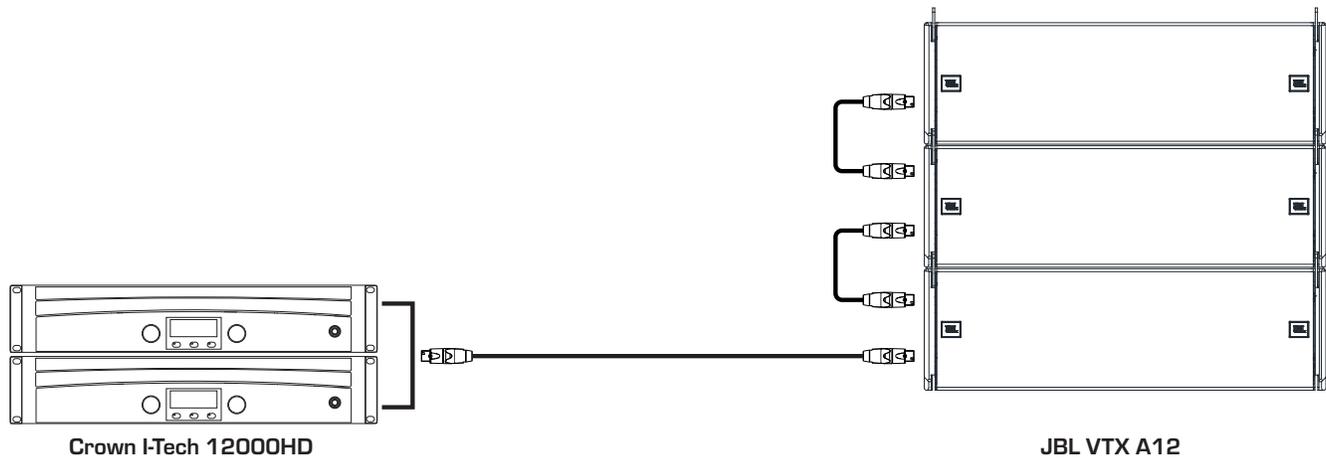


Amplifier Channels

Channel 1	A12 LF
Channel 2	A12 LF
Channel 3	A12 MF
Channel 4	A12 HF

8.2 - CROWN I-TECH 12000HD

When using Crown Audio I-Tech 12000HD amplifiers, up to 3 VTX A12 loudspeakers can be powered per pair of amplifiers. One Crown I-Tech 12000HD is used for powering the low-frequency section and another for the mid- and high-frequency sections. Based on the A12 component resource requirements, this allows for optimum power-to-transducer ratio without compromising the system's maximum SPL capabilities. Circuits of 2 cabinets can be used when higher circuiting resolution is necessary.



Amplifier 1 - Channels

Channel 1	A12 MF
Channel 2	A12 HF

Amplifier 2 - Channels

Channel 1	A12 LF
Channel 2	A12 LF



TIP: Other channel assignments can be implemented when using the 2-channel Crown Audio I-Tech HD amplifiers. Use JBL's HiQNet[®] Performance Manager[™] control software to assign speaker presets.

8.3 - CROWN AUDIO V-RACK

VTX A12 systems are compatible with the Crown Audio V-Rack 12000HD and Crown Audio V-Rack 4x3500HD touring racks. The number of supported cabinets per amplifier and wiring options remain the same as the Crown Audio I-Tech examples illustrated in this document. For more information on the Crown Audio V-Rack products, refer to the V-Rack User Manuals and documentation.



CAUTION: Make sure the total number of VTX A12 enclosures per circuit / amplifier does not exceed the maximum number recommended.

9 - VTX A12 PRESET LIBRARY

The VTX A12 preset library includes standard array and fill (FL) operating modes, along with full-range and 80Hz low-frequency processing for VTX A12 and G28/S28 subwoofer combinations. Cardioid presets are included for all VTX subwoofer models. VTX presets are exclusively developed for Crown I-Tech HD amplifiers and come bundled with JBL HiQnet® Performance Manager™ control software. Audio Architect presets are also available and can be downloaded from the JBL Pro website. Please see below for a detailed description of VTX A12 operating modes and subwoofer processing options, and refer to the Preset Library setup sheets for preset descriptions, memory locations, and output channel assignments.

9.1 - VTX A12 PRESET MODES AND OPTIONS

Two preset modes are available as are two low-frequency processing options:

VTX A12 FL: The FL presets (short for FILL) have nominally-flat frequency response and are to be used in situations where one or two A12 cabinets are appropriate, such as distributed front fills. With this preset, the acoustical low-frequency response of the system extends down to 45Hz (Fullrange).

VTX A12 FL 80: The FL 80 presets have nominally-flat frequency response and are to be used in situations where one or two A12 cabinets are appropriate, such as distributed front fills. With this preset, the acoustical low-frequency response of the system is set to 80Hz and used when subwoofers are available.

VTX A12: This is the standard VTX A12 preset for array use. A high-frequency shelving response is applied to offset LF/MF array buildup for nominally-focused arrays (equal enclosure site angle impact spacing over the desired audience coverage area). With this preset, the acoustical low-frequency response of the system extends down to 45Hz (Fullrange).

VTX A12 80: This is the standard VTX A12 preset for array use with subwoofers. A high-frequency shelving response is applied to offset LF/MF array buildup for nominally-focused arrays (equal enclosure site angle impact spacing over the desired audience coverage area). With this preset, the acoustical low-frequency response of the system is set to 80Hz. The VTX A12 80 preset will generate the highest A-weighted maximum sound pressure level.

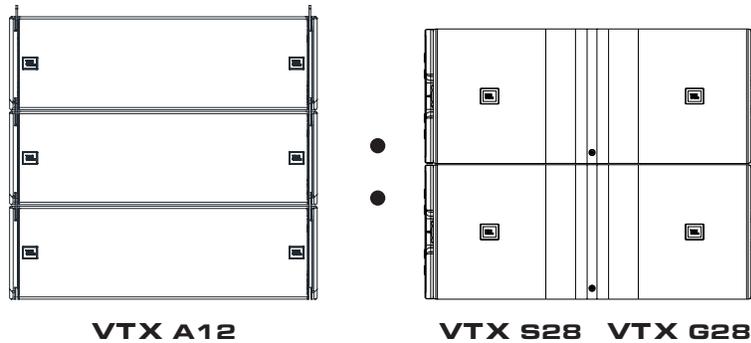


TIP:

- Both the Fullrange and 80Hz presets can be used with subwoofers depending on the application and subwoofer arrangement. For more information on using subwoofers, see chapter 9.
- Mixing FL and standard presets in the same array is not recommended.
- The VTX A12 presets provide a well-balanced tonal starting point for a given array size. The Array Size Compensation filter found in the JBL Line Array Control Panel (LACP) can be used to further fine-tune the tonal balance of an array for a given array length. Please refer to the LACP section for more information.

10 - SUBWOOFER OPTIONS

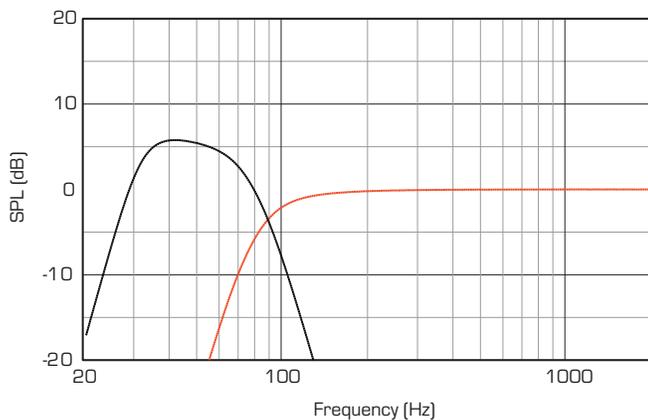
VTX A12 presets are designed for a **3:2** minimum cabinet ratio (A12 : VTX S28 or G28 subwoofers). The 3:2 ratio provides sufficient headroom for both the subwoofers and the VTX A12s to reach MAX SPL (the limiters) at the same time, while maintaining a minimum of 10dB SUB to TOP low-frequency contour. Other ratios can be used depending on the desired tonal balance target, MAX SPL and application.



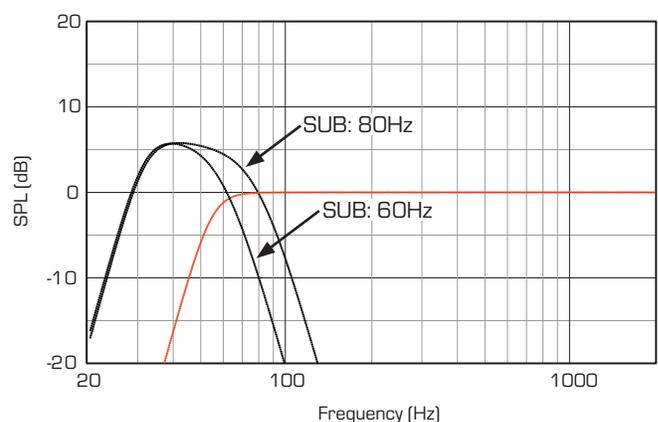
10.1 SUB / LF PRESET OPTIONS

As previously mentioned, there are two LF presets available for the A12 system: one is the VTX A12 (full range) preset, which extends the frequency response of the system down to 45Hz; the other is the VTX A12 80 (80Hz) preset, which extends the frequency response of the system down to 80Hz. The VTX A12 (full range) preset is used when the system is operated without subwoofers or when the application calls for extended LF response from the main arrays. If subwoofers are used, the A12's LF region is overlapped with the subwoofers for additional output in the shared range. The VTX A12 80 (80Hz) preset is used only when subwoofers are available and when the highest A-weighted sound pressure level (SPL) is required. The same subwoofer preset option (i.e. VTX S28 80) is compatible for use with either the VTX A12 or VTX A12 80 preset, simplifying preset selection. When multiple A12 arrays are used (i.e. main and side arrays), all VTX A12 arrays should be operated in the same LF mode for headroom consistency.

Example 1: A12 80 | SUB: 80



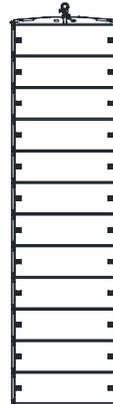
Example 2: A12 FR | SUB: 60 or 80



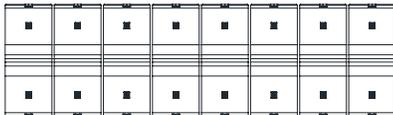
10.2 - PRESET EXAMPLE 1



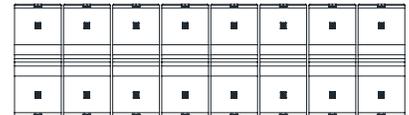
VTX A12 or VTX A12 80



VTX A12 or VTX A12 80

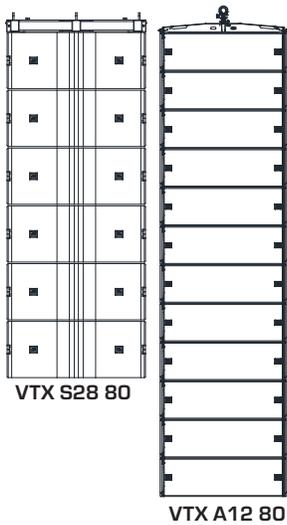


VTX G28 60 or VTX G28 80



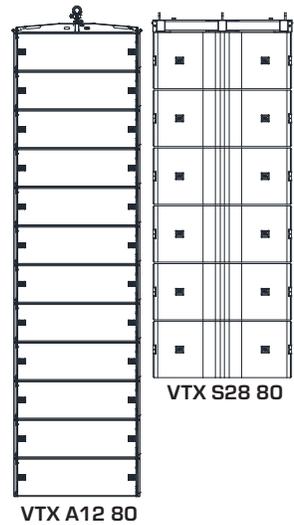
VTX G28 60 or VTX G28 80

10.3 - PRESET EXAMPLE 2



VTX S28 80

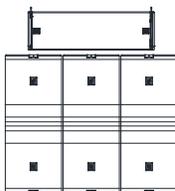
VTX A12 80



VTX A12 80

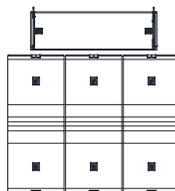
VTX S28 80

VTX A12 FL 80



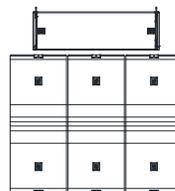
VTX G28 80

VTX A12 FL 80



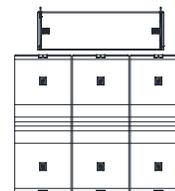
VTX G28 80

VTX A12 FL 80



VTX G28 80

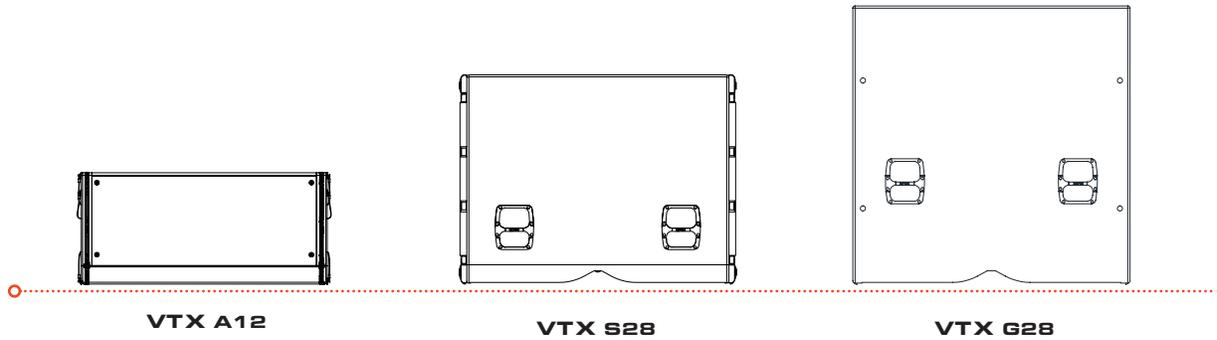
VTX A12 FL 80



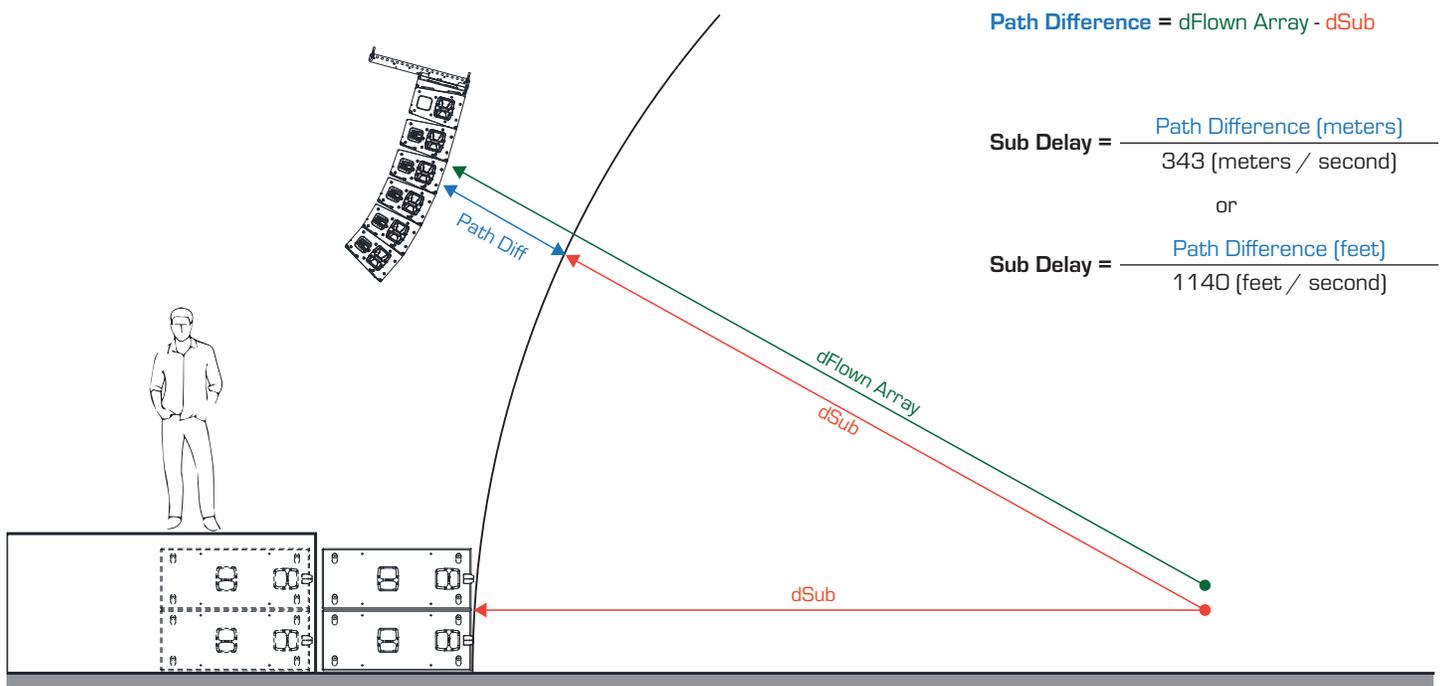
VTX G28 80

10.4 - TIME ALIGNMENT

The VTX A12 presets provide proper system summation with companion VTX subwoofers under physically coupled configurations (stacked or suspended) and when used with corresponding G28 and S28 presets. This pre-alignment is done at the factory, allowing any VTX subwoofer to be used with any VTX loudspeaker without needing specific subwoofer presets for each system and configuration. When the VTX A12 is operated in full range mode with companion subwoofers, some additional delay should be applied to the subwoofers to match the A12.



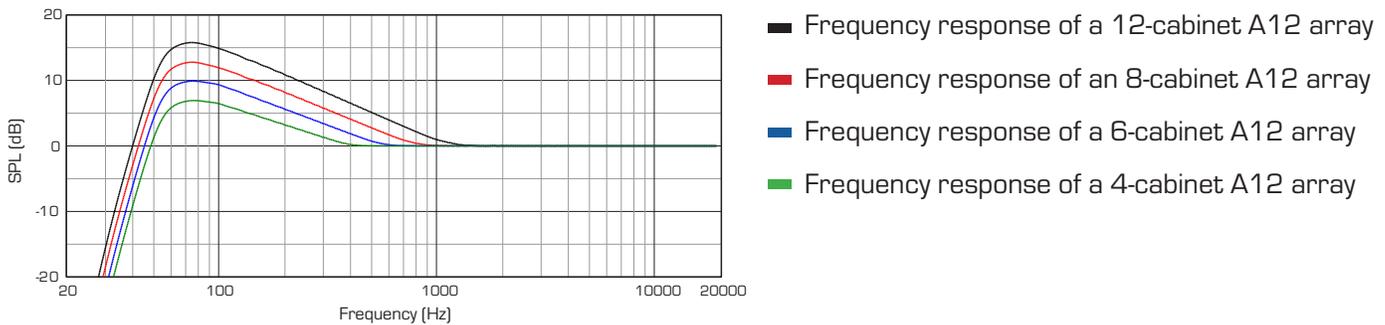
Additional time alignment delay should be added, as necessary, to account for physical path length differences between suspended A12 arrays and ground-stacked G28 or S28 subwoofers. If no acoustic measurement system is available, delay values can be calculated based on the geometric path difference between a reference point (i.e. FOH position) and each system. This is an effective method since all VTX presets include a factory pre-delay to correctly align all components. This method is not effective and should not be used when the latency of a system is unknown, such as when different parts of the system follow a different signal path that might affect latency.



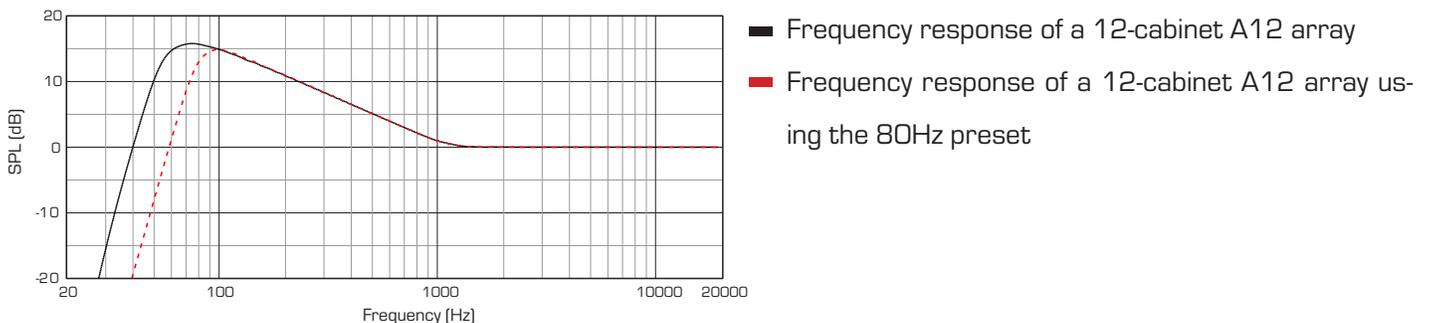
1.1 - FREQUENCY RESPONSE

The frequency response of a line array is determined by many factors, including the array size (number of boxes), array curvature (box-to-box angles), and the listening distance. JBL factory presets are designed to create a well-balanced tonal starting point for given array conditions. For example, the standard VTX A12 array presets are designed to work optimally with array sizes between 8 - 12 cabinets and equal impact spacing for a flat listening plane. An array with these parameters will generate a flat frequency response in the HF region with a gradual rise in LF energy. The frequency point where the response starts rising depends on the array parameters mentioned above. A relatively short array will start rising lower in frequency, and a longer array will start rising higher in frequency. Below are frequency response examples of A12 arrays using the standard VTX A12 presets and no additional equalization/correction (flat).

Example 1 : A12 Frequency response vs number of cabinets

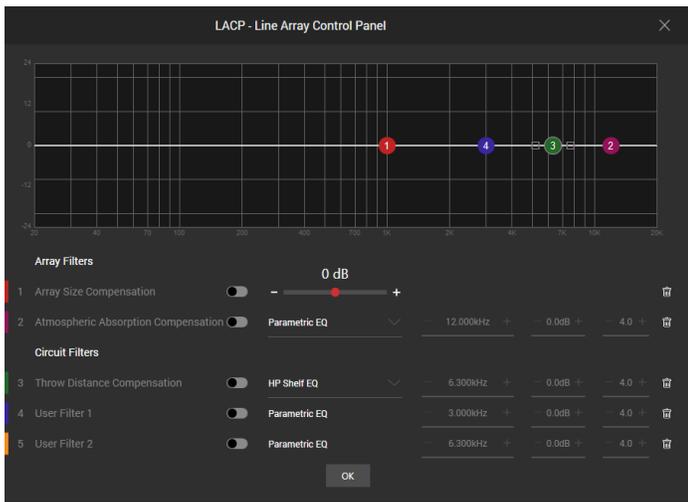


Example 2: Standard preset vs 80 preset



Since the factory preset cannot account for all variables and array configurations, user adjustment of certain DSP parameters is necessary to achieve the desired tonal balance for a given array and application. The LF response of any VTX line array system can be easily adjusted using the Array Size Compensation Filter in the JBL Line Array Control Panel. The Array Size Compensation Filter was specifically designed to compensate for LF/MF buildup with a single, adjustable parameter. Lowering the gain value of this filter will shift the LF rising point lower in frequency — similar to how shortening the length of an array works.

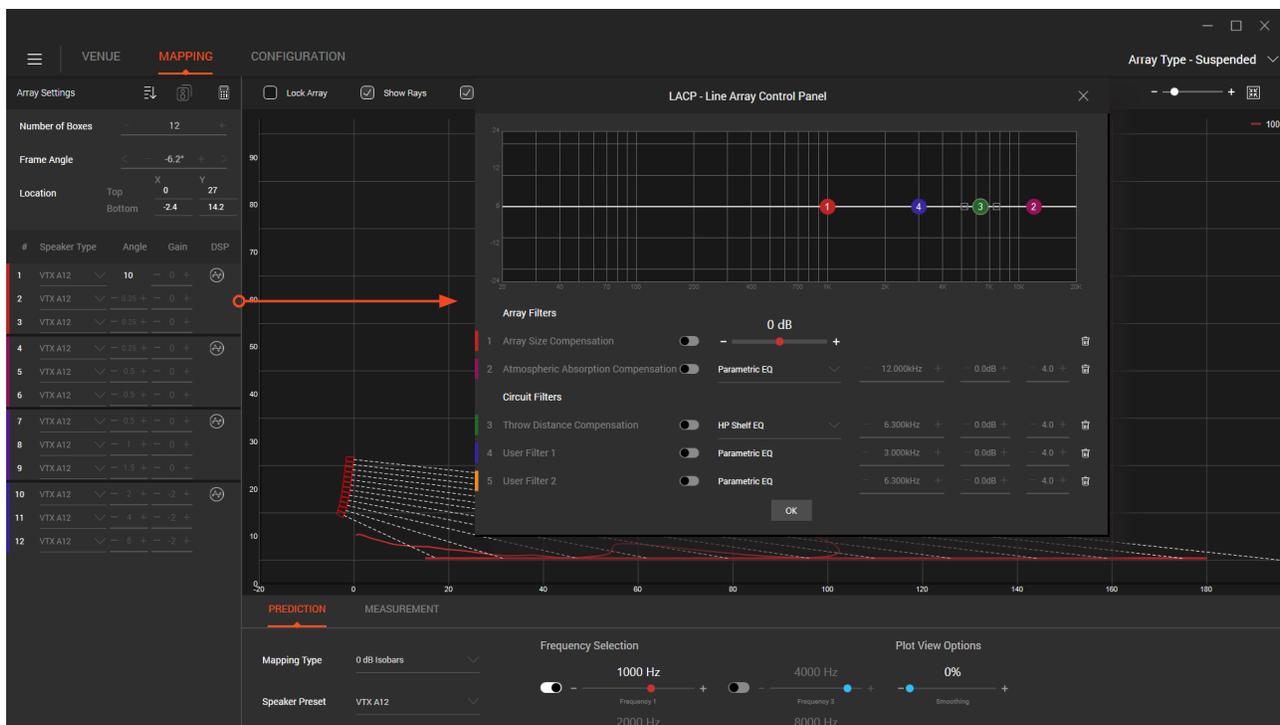
12 - LINE ARRAY CONTROL PANEL



The JBL Line Array Control Panel (LACP) was designed to tailor the tonal balance of a line array using the five included, adjustable DSP filters. Each filter serves a specific, intended purpose and accelerates the tuning process. Two of these filters are grouped across the entire array (global adjustments), and three filters are designated for circuit-specific adjustments. LACP parameters can be modeled using the JBL Line Array Calculator and then applied in real time using the JBL Performance Manager control software.

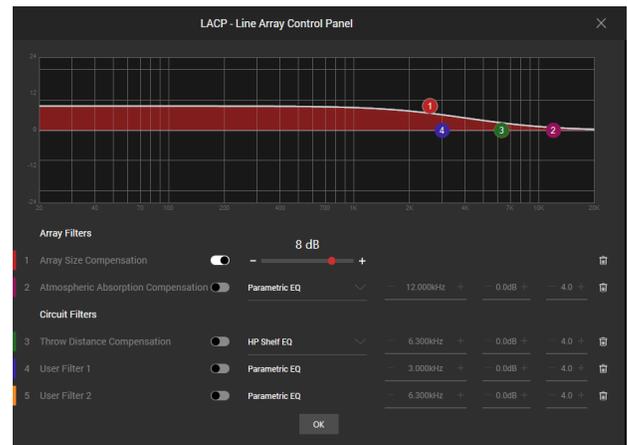
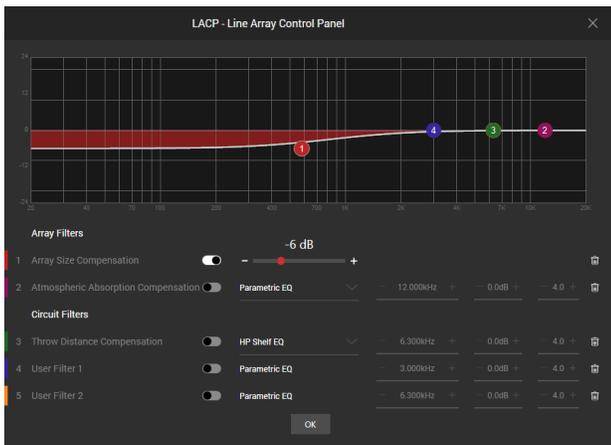
12.1 - ACCESSING LACP

LACP filters can be modeled in JBL's Line Array Calculator and then imported into JBL's Performance Manager for application to actual devices. To access LACP within the Line Array Calculator, first create circuit groups by using the included grouping feature. The created groups should represent the actual array amplification. This will allow for realistic and accurate DSP adjustments. After creating the circuit groups, click on the LACP button under the DSP column. Global filters, like Filter 1 and 2, are automatically applied to all circuit groups in the array.



1 2.2 - FILTER 1 - ARRAY SIZE COMPENSATION

Filter 1 is used to correct for LF/MF buildup when the array size/shape differ from that for which the factory preset was designed. LF adjustments should be applied to all cabinets within the array; therefore, filter 1 is automatically applied globally. Filter 1 is a continuously variable low-shelving filter, and its parameters (corner frequency and slope) are adjusted based on the applied gain value. Array buildup is different for each configuration, and Filter 1 is optimized to correct for this effect using only one parameter (Gain).



1 2.3 - FILTER 2 - ATMOSPHERIC ABSORPTION COMPENSATION

Filter 2 is used to compensate for atmospheric conditions due to large variations in temperature and humidity, which can have an impact on overall HF energy. Filter 2 is applied globally and can be used to quickly brighten or darken an array. This filter can also be used for artistic purposes to adjust overall system tonal balance.

1 2.4 - FILTER 3 - HF THROW DISTANCE COMPENSATION

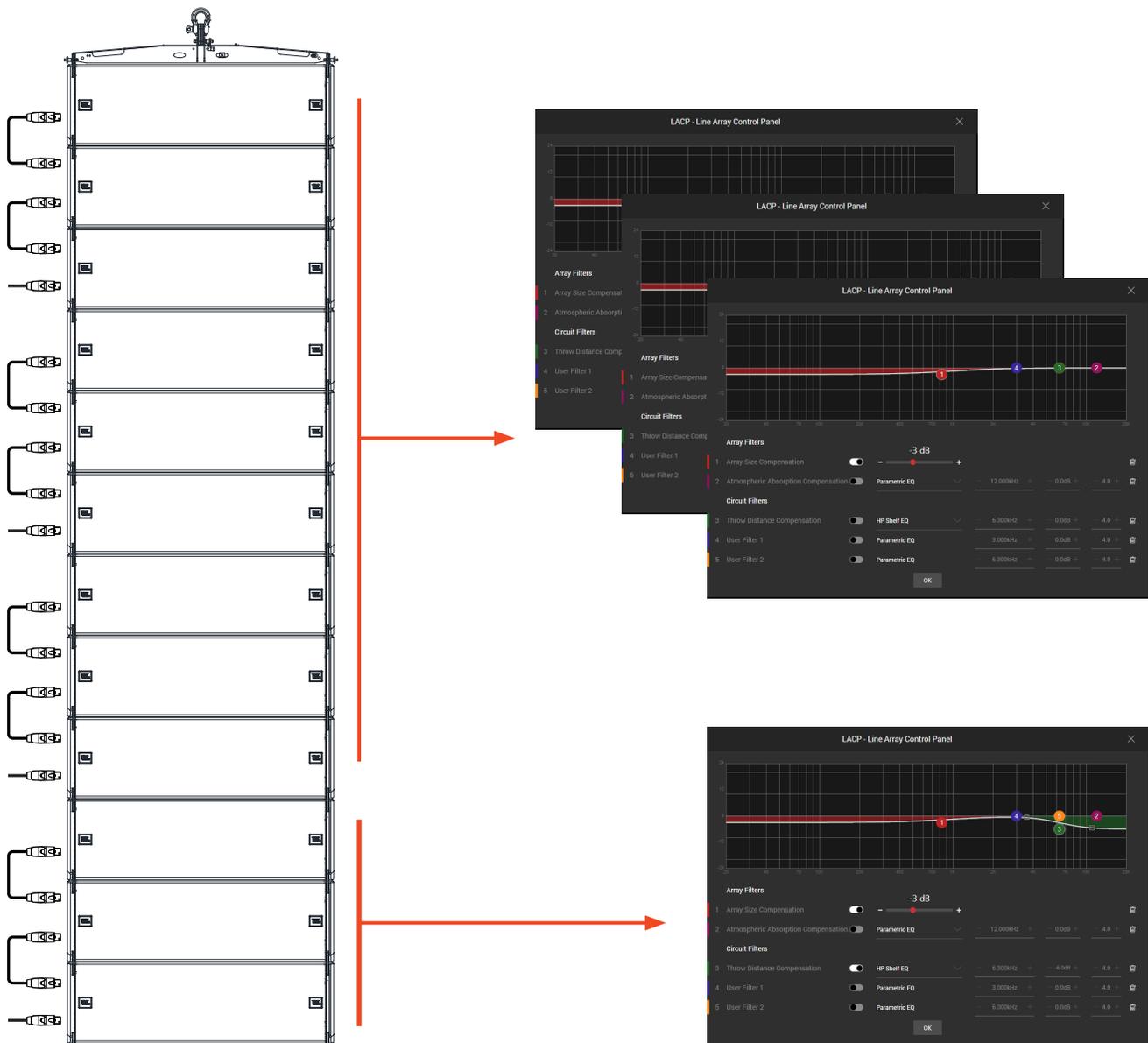
Filter 3, along with gain shading, is used to correct for distance offsets between different sections of an array. The Type, Frequency and Q parameters are linked across the entire array, but the Gain parameter is adjustable per circuit group. This filter can be used to reduce HF energy close to an array and increase HF energy to areas further away, where air absorption has a bigger impact.

1 2.5 - FILTER 4 & 5 - USER PEQ 1 & 2

Filters 4 and 5 are User PEQs, which can be applied to individual circuit groups. The Frequency and Q parameters are not linked across circuits and, for this reason, it is recommended that User PEQ 1 & 2 are used only for moderate gain changes of frequencies above 1 kHz.

12.6 - EXAMPLE USING LACP

This example is for a 12-cabinet VTX A12 array. The standard A12 preset is used with the Array Size Compensation filter set to -3dB to offset LF buildup and achieve a flatter frequency response. As seen from the illustration below, Array Size Compensation is globally applied to all array circuits. The bottom circuit includes some HF attenuation using HF Throw Distance Compensation (Filter 3) to correct for proximity differences. Using some simple adjustments to the LACP filters will get an A12 system to a very good starting point. Any further required adjustments will be dependent upon the room and specific application.



TIP: The LACP parameters used in LAC to predict an array can be easily applied to an actual array in Performance Manager. For information on how to import LACP parameters in Performance Manager, please refer to the Performance Manager documentation.

13 - TESTING VTX A12

Speakers need to be periodically checked and maintained in order to assure long-term performance and reliability, and VTX A12 is no exception. While the system is designed for the utmost reliability, it is important to confirm that the system is operating within specified tolerances to ensure optimal performance for years to come. Below are two methods that can be utilized to check and verify proper performance of the transducer compliment in the VTX A12 system.

13.1 - USING A DMM (DIGITAL MULTI METER)

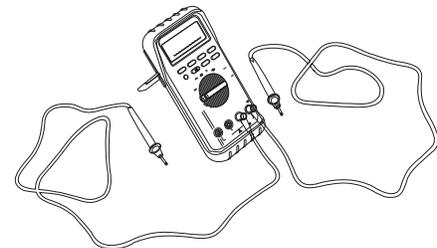
This method is best suited for when the speaker system is in the shop, a DCR test with a multimeter can give a very accurate reading of how many transducers are properly wired together and within their standard operating tolerances. This test is appropriate for individual boxes and not groups.

With the A12 speaker unplugged from any amplifiers, set a DMM to the resistance (Ω) setting and place the probes across the 1+/-, 2+/-, 3+/-, and 4+/- leads. Record the values indicated on the DMM for each pair of leads and refer to the chart below to either confirm correct readings or investigate out-of-tolerance DCR readings.

HF Section (Pin 4)		
	DCR	Tolerance
All drivers functioning	7.0 Ω	+/- 0.2 Ω
1 x HF Driver open	10.3 Ω	+/- 0.2 Ω
2 x HF Drivers open	20.5 Ω	+/- 0.2 Ω
3 x HF Drivers open	OL	-
Any driver shorted	0.2 Ω	-

MF Section (Pin 3)		
	DCR	Tolerance
All woofers functioning	5.4 Ω	+/- 0.2 Ω
1 x woofer open	10.8 Ω	+/- 0.2 Ω

LF Section (Pin 1 / 2)		
	DCR	Tolerance
Functioning woofer	5.5 Ω	+/- 0.2 Ω
Shorted	0.2 Ω	-



Notes:

- The DCR numbers listed above assume cold (room temperature) transducers. If taken right after use, and when the transducers are warm, the numbers will vary. For best results test the speakers cold.
- The DCR value of a transducer gives an accurate representation of its electrical state. Any mechanical defects are not characterized by this test. Refer to the VTX A12 service manual for instructions on how to perform a rub-and-buzz test using a sine wave generator.

13.2 - USING PERFORMANCE MANAGER

When in the field, the **Test System Mode** in Performance Manager can be used to test an A12 system. This test method is quick and especially useful for determining whether all the speaker cables, including cabinet-to-cabinet NLB jumpers, are properly functioning.

To perform the test, Performance Manager is using the I-Tech HD's built in noise generator in conjunction with the amplifier's current draw and voltage sensing capabilities to generate a nominal impedance reading for what is connected on each amplifier channel. Since a broadband Pink Noise is used as the test stimulus, the returned value is considered to be an impedance value and it will differ from the resistance values given earlier in this document (which are taken using DC voltage as the stimulus).

STEPS:

- To start the test make sure Performance Manager is Online and connected to the devices.
- Navigate to the Test System Mode and make sure all the speakers are Muted
- Switch the Noise Generator to the ON position and change the level to a value between -30dB and -10dB. Values lower than -30dB may not be sufficient to trigger a reading
- Unmute the speaker or a bandpass to start the measurement. The measured value is displayed on the speakers.

13.3 - PERFORMANCE MANAGER READINGS

Below are the expected impedance values for a single VTX A12, a circuit of 2 x A12s and a circuit of 3 x A12s. The measurements below were taken at room temperature with a cable length of 25m (82'). Acceptable tolerance is +/- 0.5 Ω.



Due to variances in temperature, cable length, wire gauge and usage, the measurements recorded by Performance Manager are more susceptible to drifting based on conditions. However, condition variations like temperature are common across all similar circuits of a system. More important than the individual component values is consistency across similar circuits. For example, all 3 x Box circuits for an array should measure similarly. If one is off by several ohms then there is likely something wrong with that specific circuit.

1 4 - SPECIFICATIONS

System

Frequency Range (-10 dB): 46 Hz - 19 kHz (Preset: VTX A12)

Coverage Pattern (-6dB)

Horizontal: 90 degrees nominal (250Hz - 18kHz)

Vertical: Varies with array size and configuration

System Input Power Rating¹

LF: 2 x 800W Continuous (IEC / 100 hour)

MF: 400W Continuous (IEC / 100 hour)

HF: 150W Continuous (IEC / 100 hour)

Maximum Peak Output²: 146dB (Preset: VTX A12)

System Processing: Crown Audio I-Tech HD Series
Crown Audio I-Tech 4x3500HD

System Impedance

LF: 2 x 8 ohms

MF: 8 ohms

HF: 8 ohms

Transducers

Low Frequency: 2 x JBL 2264H, 12in diameter, dual 3in diameter voice coil, Neodymium Differential Drive

Mid Frequency: 4 x JBL 2165H, 5.5in diameter, dual 2in diameter voice coil, Neodymium Differential Drive

High Frequency: 3 x JBL 2423K, 2in diameter annular diaphragm, 2in diameter voice coil, Neodymium Magnet

Enclosure

Construction: 18mm and 15mm, 11-ply Finnish birch plywood, Black DuraFlex™ finish, integral recessed handles

IP Rating³: IP55 EN (60529)

UV Rating: 6 (ISO105-B01)

Suspension: Captive suspension plates, quick-release pins, auto-locking mechanism for setting angles

Inter-enclosure Angle: 0.25, 0.5, 1, 1.5, 2, 2.5, 3, 4, 6, 8, 10

Grill: Powder coated 14-gauge hex-perforated steel with acoustically transparent black cloth backing

Connectors

Type: Neutrik® SpeakON® NL8 (2x)

Pin Assignments: Pins 1 ± (LF), Pins 2 ± (LF),
Pins 3 ± (MF), Pins 4 ± (HF)

Dimensions (H x W x D): 330.2mm x 1.118mm x 495.3mm
13.0in x 44.0in x 19.5in

Net Weight: 60.8 kg (134.0 lbs)

Footnotes:

1: IEC Standard: IEC shaped noise with 6dB crest factor based on nominal impedance and a duration of 100 hours

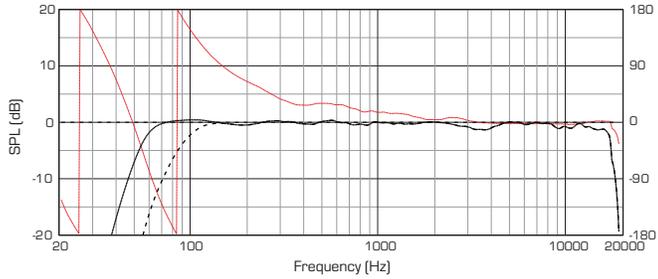
2: Peak, unweighted SPL, measured under full-space conditions at 1 meter using broadband pink noise with a 12dB crest factor and specified preset

3: Front face at 0 degree or greater down angle to allow the cabinet to drain water. Suspension components fully weather rated for indoor or covered outdoor conditions where humidity is nominally under 50% and not local to bodies of corrosive materials

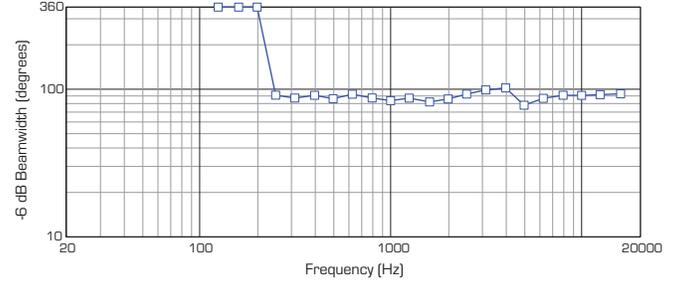
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15 - ACOUSTIC MEASUREMENTS

FREQUENCY RESPONSE



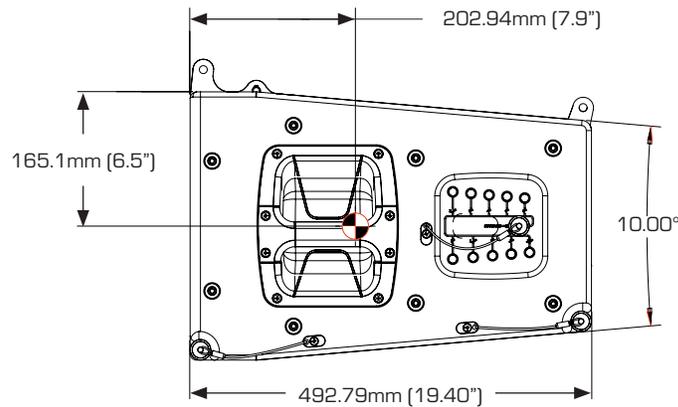
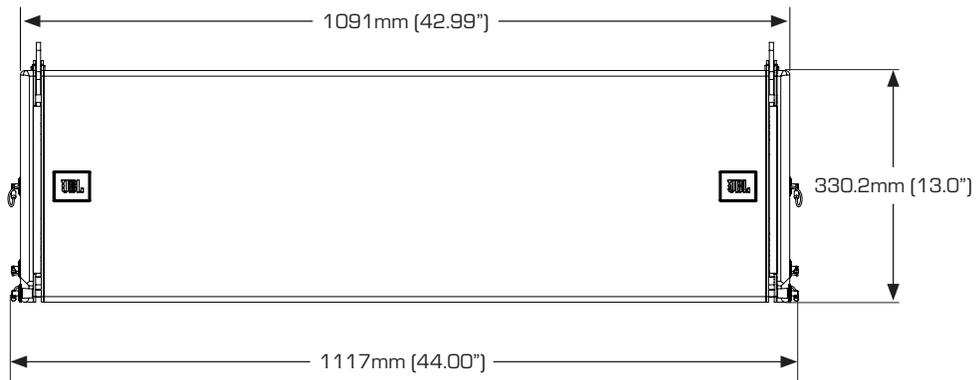
BEAMWIDTH



— VTX A12 FL - - - VTX A12 FL 80 — VTX A12 Phase

— Horizontal Beamwidth

16 - DIMENSIONS



17 - CONTACT INFORMATION

Harman Professional Headquarters

8500 Balboa Blvd.
Northridge, CA 91329
+1 (800) 852-5776
www.jblpro.com

Worldwide Customer Service:

Monday through Friday
8:00am - 5:00pm
Pacific Coast Time in the U.S.A.
(800) 8JBLPRO (800.852.5776)
www.JBLservice.com

Worldwide Technical Support:

Monday through Friday
8:00am - 5:00pm
Pacific Coast Time in the U.S.A.
(800) 8JBLPRO (800.852.5776)
support@jblpro.com

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