VTX SERIES

system solutions

VTX V20

APPLICATION GUIDELINES

JBL PROFESSIONAL by HARMAN

CONTENTS

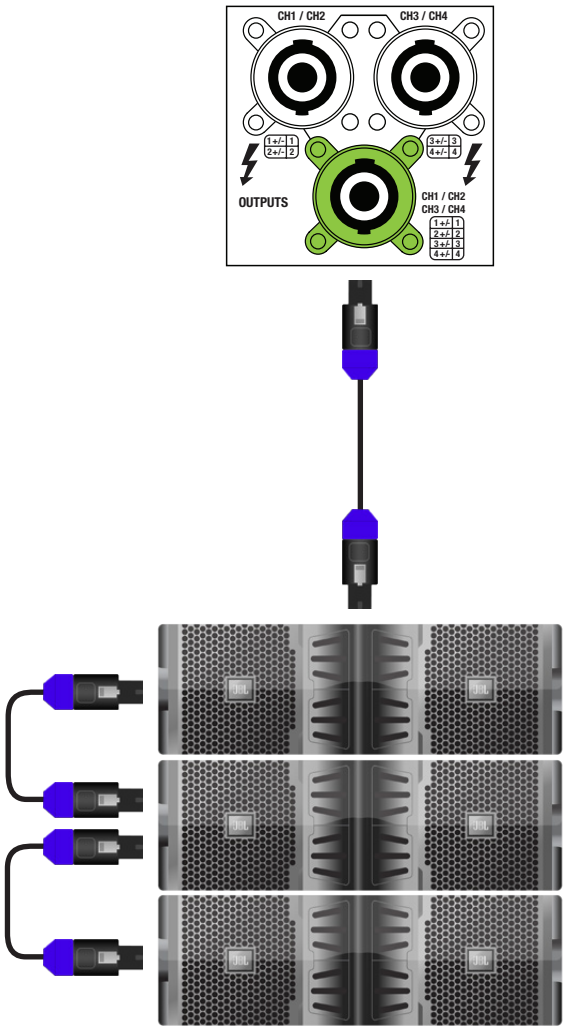
VTX V20 ACTIVE MODE

QUAD-AMPLIFIED

The configuration of three VTX V20 boxes in parallel driven off one I-Tech 4x3500HD or two I-Tech 12000HD amplifiers will drive a VTX V20 system to full output.

IT 4 x 3500HD

I-TechHD 4 channel amplifier
NL8/NL4 output pin channel assignments



VTX V20 PASSIVE MODE

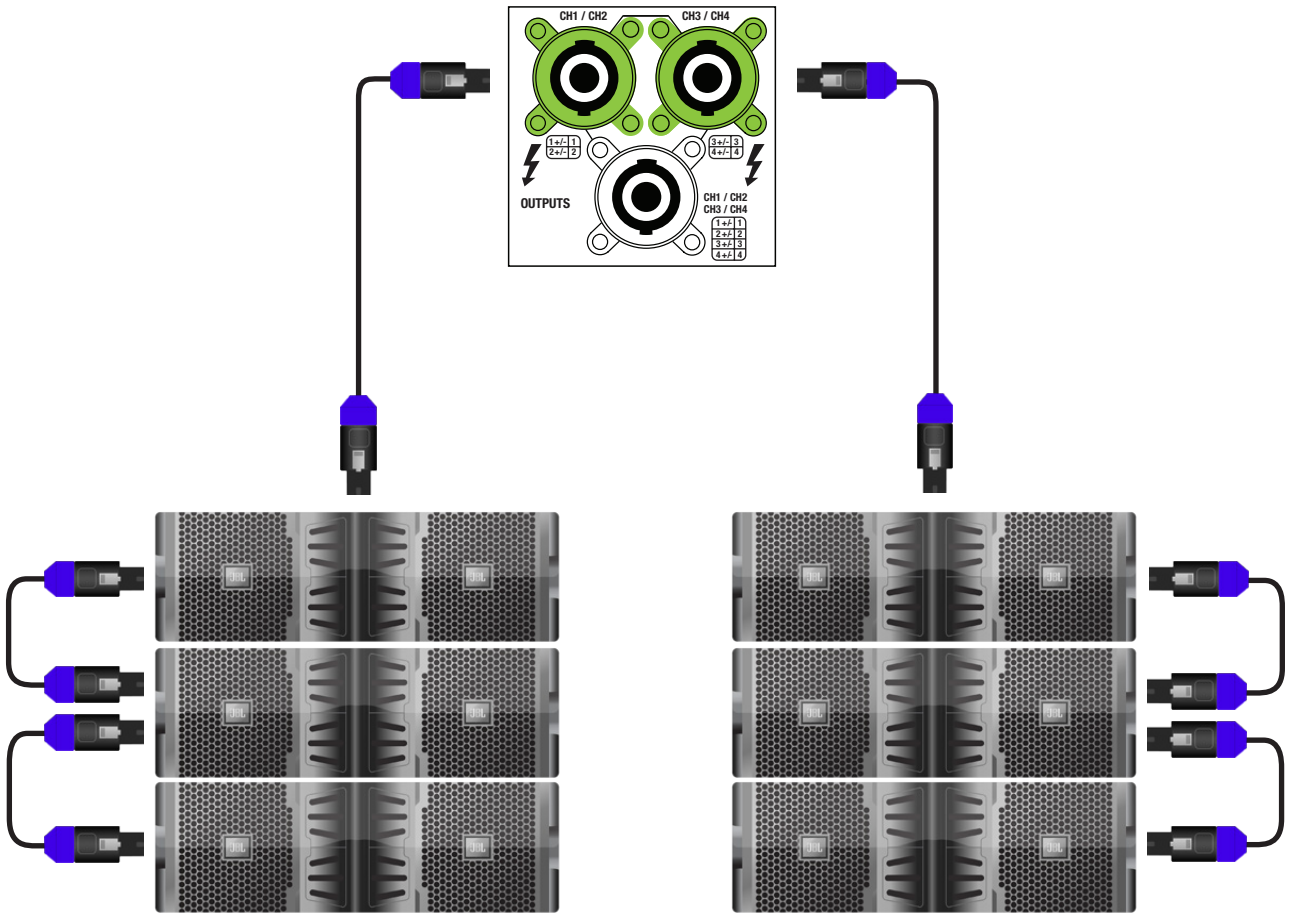
2-WAY BI-AMPLIFIED

When configured in 2-way passive mode, an internal passive network in the VTX V20 is engaged, allowing for MF and HF sections to be driven by one amplifier channel and 2 x 10" woofers driven by another. V20 systems operated in this mode offer the same voicing and sound quality as the full active mode but at a 3dB reduction of MAX SPL.

Given the significant reduction of amplifier channels required to drive a V20 system, this mode is ideal for fixed installations where MAX SPL is not the system design priority or budget restricted applications.

IT 4 x 3500HD

I-TechHD 4 channel amplifier
NL8/NL4 output pin channel assignments



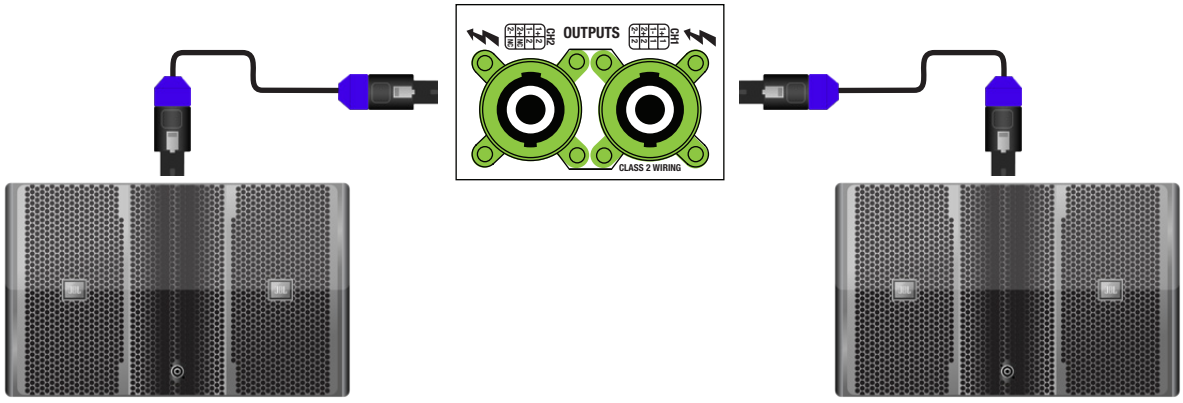
VTX S25

JBL recommends VTX S25 systems to be connected at an impedance of 4ohms. This configuration when used with the Crown I-Tech 4x3500HD will drive VTX S25 subwoofers to full output.

VTX S25 is an optional companion subwoofer, designed to integrate with suspended or ground supported VTX V20 arrays. Both the VTX S25 and S28 subwoofers deliver similar SPL output for pairing with VTX V20. However, it's important to note when choosing which subwoofer to use that the VTX S28 is capable of low frequency extension beyond the range of the S25.

VTX S25 Driven in Parallel Crown I-Tech 12000HD

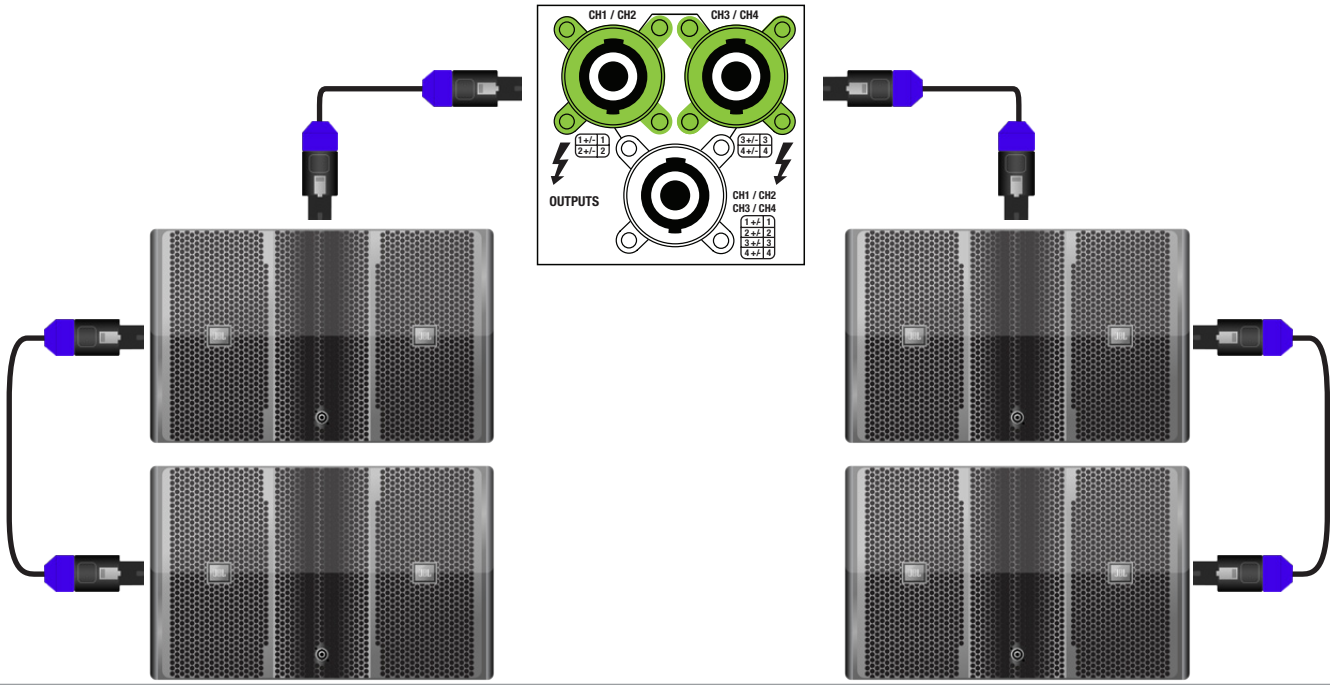
I-TechHD 2 channel amplifier
NL4 output pin channel assignments



Note: Special adapter cable or output panel wiring required

VTX S25 Driven in Discrete Crown I-Tech 4x3500HD

I-TechHD 4 channel amplifier
NL8/NL4 output pin channel assignments



THREE PRESET OPTIONS ARE AVAILABLE FOR VTX V20: ST, LT AND XLT

VTX V20 ST (Single Box and Short Throw) presets have nominally-flat low and high frequency response and are to be used in situations were one to three V20 cabinets are appropriate, such as distributed front fills, stacked side fills for stage monitoring or stacked theater/club systems. ST preset tonal balance is intended to be used for small arrays. **(1 - 3 x V20)**

VTX V20 LT (Long Array and Long Throw) presets have a 6 dB low-frequency shelving characteristic and high-frequency shelving response (HF pre-emphasis) to offset LF/MF array buildup and air absorption over typical medium-to-long throw distances for nominally-focused arrays (equal enclosure site angle impact spacing over the desired audience coverage area). LT preset tonal balance is intended to be used for small to medium size arrays. **(4 - 8 x V20)**

VTX V20 XLT (Extra Long Arrays and Extra Long Throw) presets have a 6 dB low-frequency shelving characteristic and high-frequency shelving response (HF pre-emphasis) to offset LF/MF array buildup and air absorption over typical long– to extra-long throw distances for nominally-focused arrays . XLT preset tonal balance intended to be used for medium to large size arrays. **(8 - 16+ x V20)**

Notes:

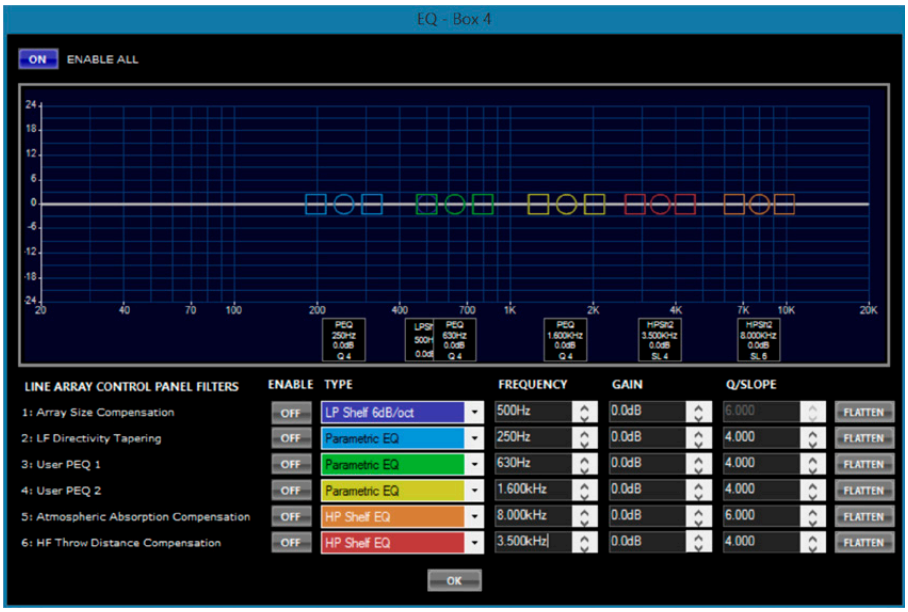
· Mixing ST, LT, and XLT presets within the same array (for example, ST presets on lower circuits, LT presets on middle circuits and XLT on upper circuits of the array) is not recommended.

· The LT and XLT presets provide a good tonal balance starting point for a given array size. The Array Size Compensation filter found in the JBL Line 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.

· For more details on working with the JBL Line Array Control Panel, please refer to the Performance Manager or JBL Line Array Calculator help files.

JBL Line Array Control Panel (LACP)

The frequency response of a line array is determined by many factors including the array size (number of boxes), array curvature, and the listening distance. JBL factory presets (ST, LT, and XLT) were designed to create an appropriate tonal balance starting point for the array conditions described above. Since the number of presets that can be created by a manufacturer is not infinite, user adjustment of certain DSP parameters is necessary to create the desired tonal balance for a given array and application. The JBL Line Array Control Panel (LACP) was designed to help system engineers quickly and easily manipulate the tonal balance of an array. LACP parameters can be modeled in JBL Line Array Calculator 2 (LAC-II) and applied in real time using JBL Performance Manager control software. The LACP consists of 6 adjustable DSP filters, each with a specific intended purpose. Some of these filters are grouped across the entire array (global adjustments), some filters are circuit group specific, and some filters have frequency centers and Q values that are linked but have adjustable circuit gain. Below is a description of how these 6 filters work:



1. Array Size Compensation: Filter 1 is intended for correcting LF/MF build up created by an array that is longer than the intended preset. LF adjustments should be applied to all cabinets within the array, therefore filter 1 is a global filter.

2. LF Directivity Tapering: Filter 2 is intended for stabilizing or adjusting the vertical coverage angle of the array at low frequencies. Frequency centers and Q values are linked across circuits.

3.-4. User PEQ 1 & 2: Filters 3 and 4 are User PEQs that can be applied to individual circuit groups. Frequency centers and Q are not linked across circuits and for this reason, it is recommended that User PEQ 1 &2 are used for frequencies above 1kHz with moderate gain changes only.

5. Atmospheric Absorption Compensation: Filter 5 is intended to compensate for atmospheric conditions due to large variations in temperature and humidity that can have an impact on the overall HF energy. Filter 5 is applied globally and can be used to quickly brighten or darken an array. This filter can also be used for artistic preference reasons to adjust overall system tonal balance.

6. HF Throw Distance Compensation: Filter 6 along with Gain shading is intended to correct for distance offsets between different sections of an array. The Type, Frequency and Q are linked across the entire array but the gain 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.

HYBRID CONFIGURATIONS

When additional subwoofer impact and A-weighted SPL output is desired, hybrid configurations of VTX V20 cabinets with VTX S25 and VTX S28/G28 can be deployed. Whether overlapping the S25 and S28/G28 subwoofers with their respective 80hz crossover settings, or utilizing the '5-way' configuration of VTX V20 120 / VTX S25 60-120 / VTX S28/G28 60 that optimizes each cabinet for maximum output in their respective bandpasses, deploying the proper amount of VTX subwoofers with VTX V20 full-range cabinets will ensure that the system will deliver impressive results in even the most demanding situations.

V20	S25	S28 or G28
3	1 AND	2
FREQUENCY (Hz)		
120	120-60	60

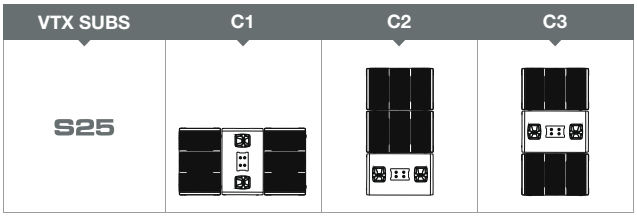
EXTENDED LOW FREQUENCY RESPONSE

Three V20 for every additional two S25 is ideal for applications where LF reinforcement is needed. VTX V20 presets are designed for 3:2 cabinet ratio (V20 : VTX S28 or G28 or S25 subwoofers). The 3:2 ratio provides sufficient headroom for both the subwoofers and the V20's to reach MAX SPL (limiters) at the same time, while maintaining a 10dB SUB to TOP contour. Other ratios can be used depending on the desired tonal balance target, MAX SPL, and application.

V20	S25	S28 or G28
3	2 OR	2
FREQUENCY (Hz)		
60 80 120	60 80 120	60 80

CARDIOID CONFIGURATIONS

VTX S25, S28 and G28 cardioid subwoofer presets are optimized to work in either C1, C2 or C3 configurations:



Utilizing these optimal cardioid configuration ratios will ensure that system deployments have both the proper ratio of VTX V20 cabinets to subwoofer cabinets, and also the proper count of subwoofer cabinets for easy deployment in cardioid blocks of three cabinets each.

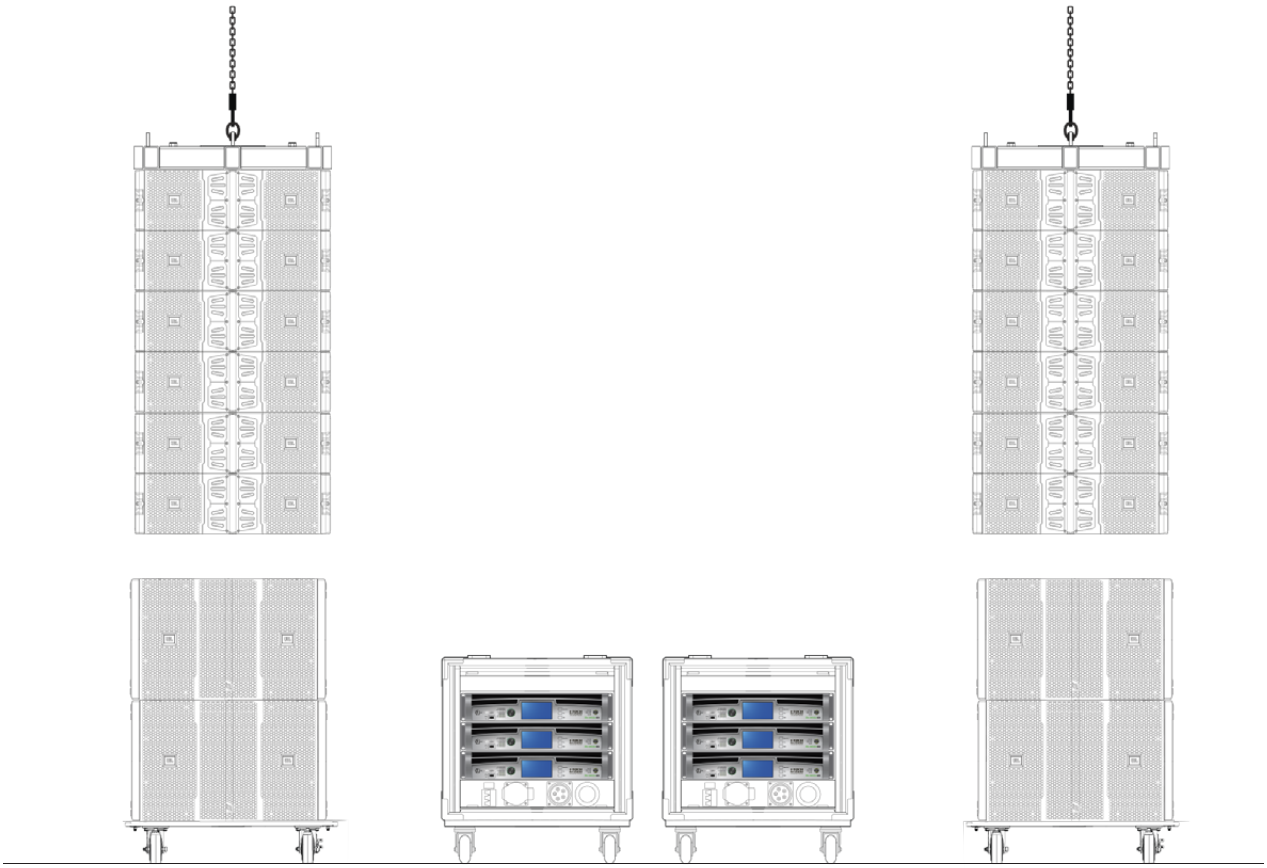
Optimal Cardioid Configuration Ratios		
3:1	3:2	3:1:1
9:3	9:6	9:3:3
18:6	18:12	18:6:6

SMALL SYSTEM RECOMMENDED CONFIGURATION

FLAT FREQUENCY RESPONSE

VTX V20	VTX S25
12	4

Ratio
3:1



Accessories:

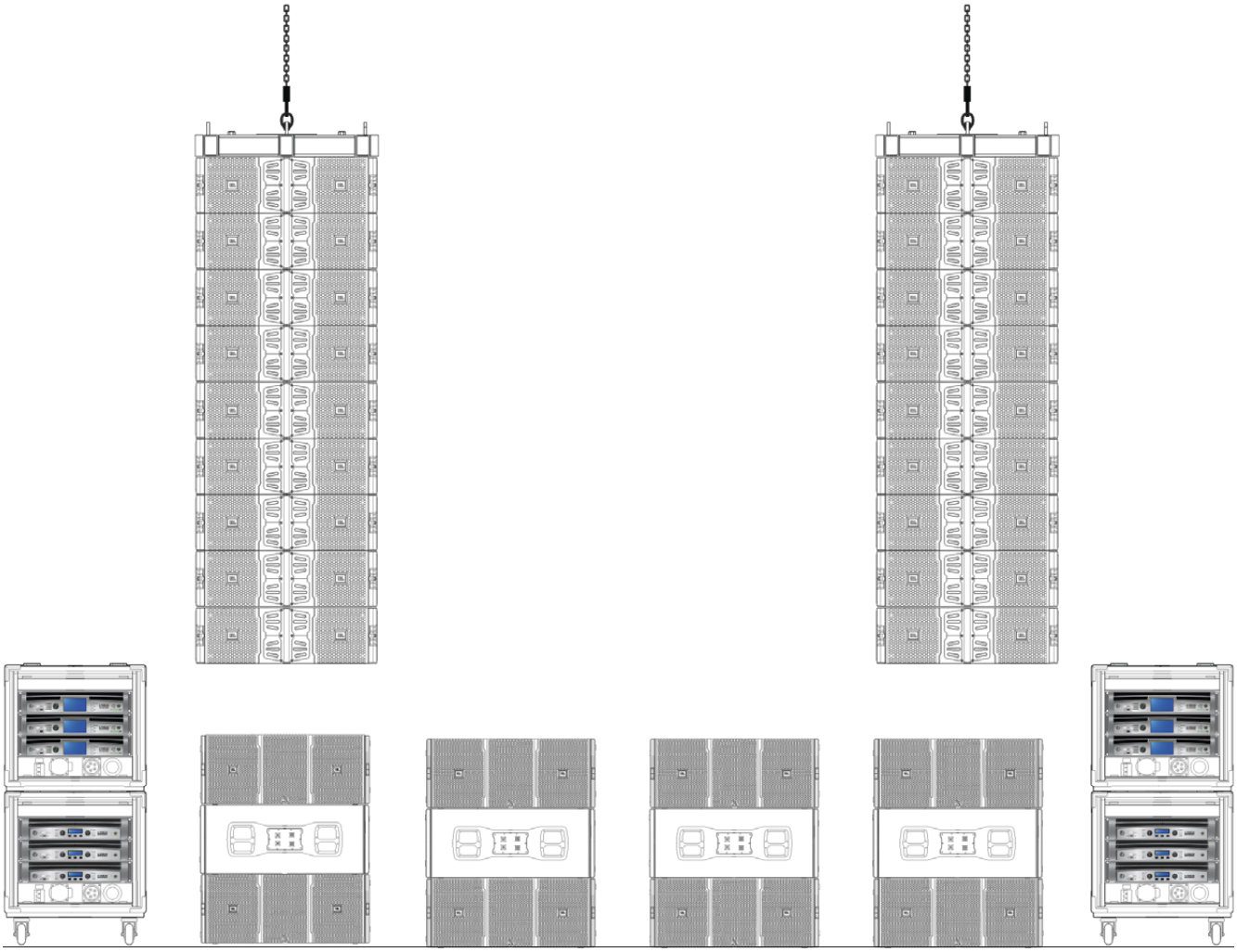
VTX-V20-VT: 4
VTX-V20-VT-CVR: 2
VTX-V20-VT-CVRW: 2
VTX-S25-VT: 2
VTX-S25-VT-CVR: 2
VTX-S25-VT-CVRW:
VTX-V20-AF: 2
VTX-V20-AF-EB: 2 (opt.)
VTX-V20-PB: 2 (opt.)
VTX-V20-LH: 2 (opt.)
VRACK12000:
VRACK4x3500: 2

MEDIUM SYSTEM RECOMMENDED CONFIGURATION

EXTENDED LOW FREQUENCY RESPONSE

VTX V20	VTX S28
18	12

Ratio
3:2



Accessories:

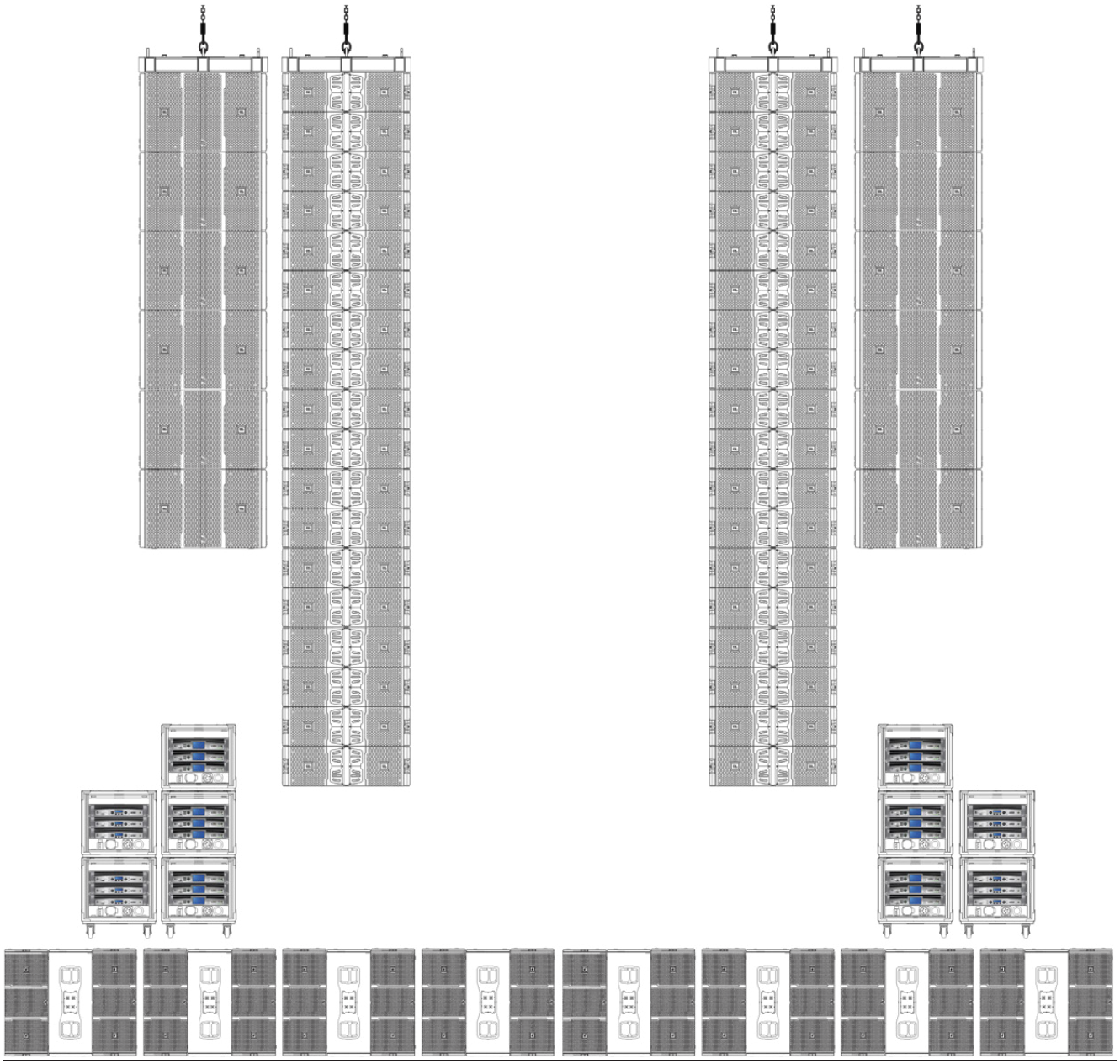
VTX-V20-VT: 6
VTX-V20-VT-CVR: 4
VTX-V20-VT-CVRW: 2
VTX-S25-VT:
VTX-S25-VT-CVR:
VTX-S25-VT-CVRW:
VTX-S28-VTC: 4
VTX-S28-VT-CVR: 4
VTX-V20-AF: 2
VTX-V20-AF-EB: 2 (opt.)
VTX-V20-PB: 2 (opt.)
VTX-V20-LH: 2 (opt.)
VRACK12000: 2
VRACK4x3500: 2

LARGE SYSTEM RECOMMENDED CONFIGURATION

HIGH PERFORMANCE WITH EXTENDED LOW FREQUENCY RESPONSE

VTX V20	VTX S25	VTX G28
36	12	24

Ratio
3:1:2

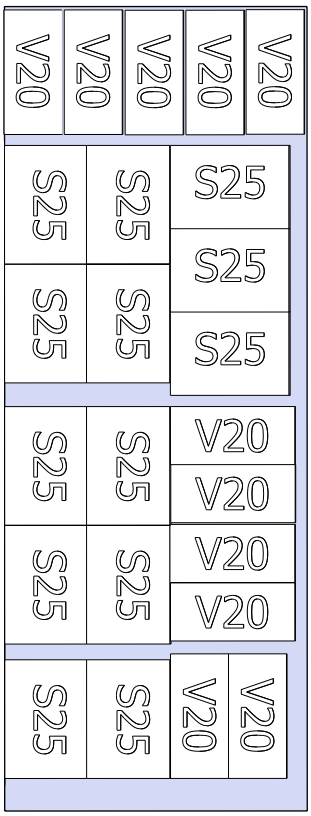


Accessories:

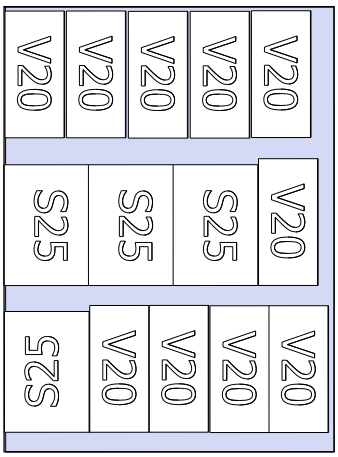
VTX-V20-VT: 10
VTX-V20-VT-CVR: 8
VTX-V20-VT-CVRW: 2
VTX-S25-VT: 4
VTX-S25-VT-CVR: 2
VTX-S25-VT-CVRW: 2
VTX-V20-AF: 4
VTX-V20-AF-EB: 4 (opt.)
VTX-V20-PB: 2 (opt.)
VTX-V20-LH: 2 (opt.)
VRACK12000: 4
VRACK4x3500: 6

V20 / S25 TRUCK PACK RECOMMENDATIONS

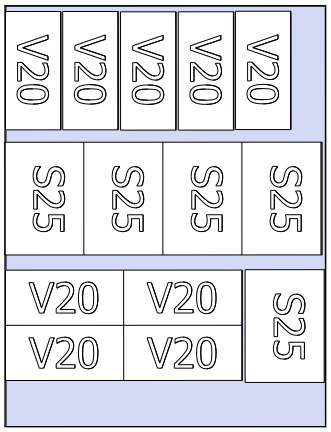
TRUCK WIDTH SIZE	
90in	228cm



TRUCK WIDTH SIZE	
96in	243cm



TRUCK WIDTH SIZE	
100in	254cm

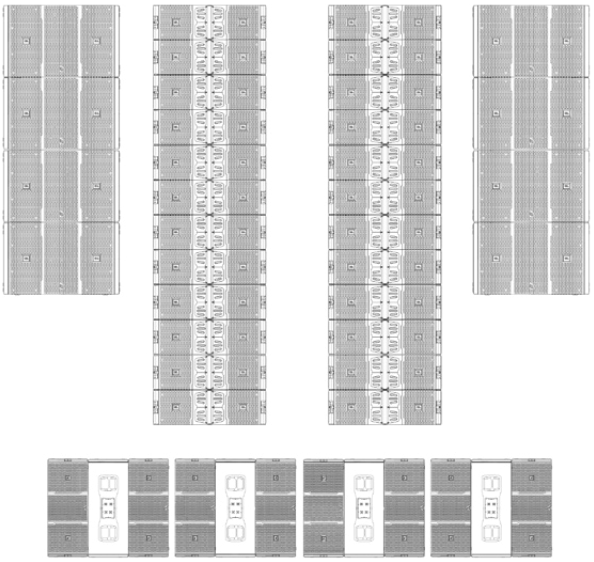


FOH SYSTEM - 4-WAY OR 5-WAY MODE

SYSTEM INFORMATION:

V20: 24
S25: 8
S28: 12

(6X VRACK 4X3500)

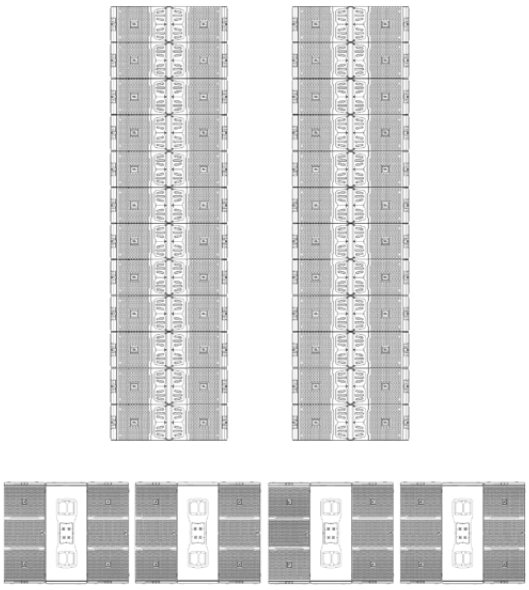


LARGE FOH SYSTEM - 4-WAY MODE

SYSTEM INFORMATION:

V20: 24
S28: 12

(5X VRACK 4X3500)

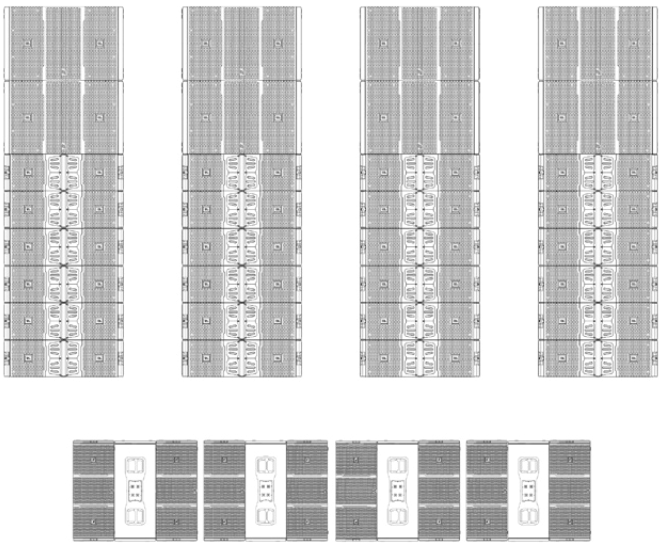


DISTRIBUTED FOH OR DELAY SYSTEM - 4-WAY MODE

SYSTEM INFORMATION:

V20: 24
S25: 8
S28: 12

(6X VRACK 4X3500)

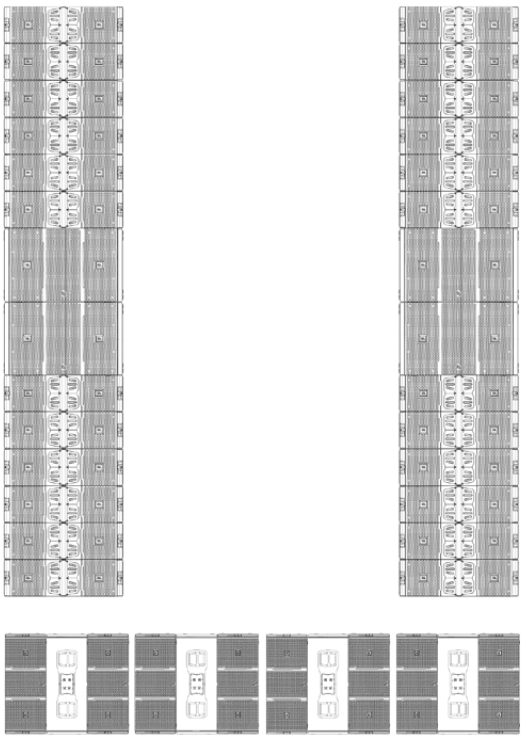


THEATER FOH SYSTEM - 4-WAY OR 5-WAY MODE

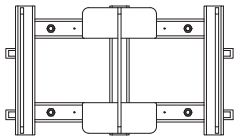
SYSTEM INFORMATION:

V20: 24
S25: 4
S28: 12

(6X VRACK 4X3500)

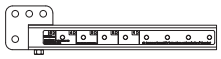


ACCESSORIES

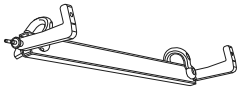


VTX-V20-AF

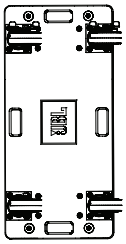
VTX-V20-LH



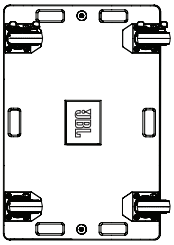
VTX-V20-AF-EB



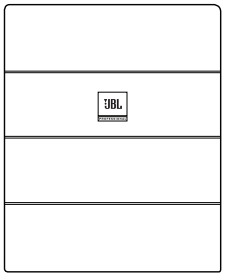
VTX-V20-PB



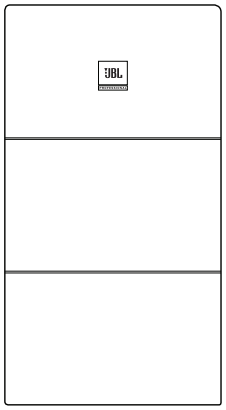
VTX-V20-VT



VTX-S25-VT



VTX-V20-CVR
VTX-V20-VT-CVRW Available for Transport With VTX-V20-AF Attached



VTX-S25-CVR
VTX-S25-VT-CVRW Available for Transport With VTX-V20-AF Attached

For every 3 or 4 VTX V20 systems:

- (1) VTX-V20-VT
- (1) VTX-V20-VT-CVR or VTX-V20-VT-CVRW

V20	VTX-V20-VT	VTX-V20-CVR
3-4	1	1

For every 2 or 3 VTX S25 systems:

- (1) VTX-S25-VT
- (1) VTX-S25-VT-CVR or VTX-S25-VT-CVRW

S25	VTX-S25-VT	VTX-S25-CVR
2-3	1	1

For each array of VTX V20/S25 to be suspended:

- (1) VTX-V20-AF is required
- (1) VTX-V20-AF-EB is optional
- (1) VTX-V20-PB, (1) VTX-V20-LH are required for compression-style suspension (V20 arrays or mixed arrays only)

		FOR COMPRESSION-STYLE SUSPENSION	
VTX-V20-AF	VTX-V20-AF-EB	VTX-V20-PB	VTX-V20-LH
1 Required	1 Optional	1 Required	1 Required

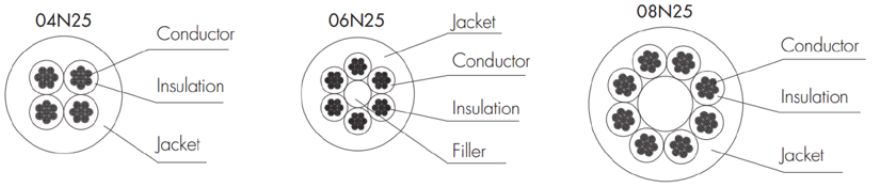
CONNECTOR RECOMMENDATIONS

The Neutrik speakON STX Series was especially designed for heavy duty amplifier-loudspeaker applications like professional touring. They are durable and feature an all metal housing which makes them the recommended connectors for VTX-Series loudspeakers.

SPEAKER CABLE RECOMMENDATIONS

The minimum recommended wire gauge for VTX systems is 2.5mm (13 AWG) and 4.0mm (11 AWG) for longer cable runs. Choose a cable that was designed for Touring applications with the outer jacket made out of flexible and flame retardant PVC. Below is an example of a good speaker cable made by Link/Eurocable.

eurocable



Multicore

Available in 2.5 and 4.0 mm² both for 4, 6 and 8 poles (2, 3 & 4 ways and in 4.0 mm² for 16 poles (8 ways) and 24 poles (12 ways).

Part Number: 445709-001
06-072915