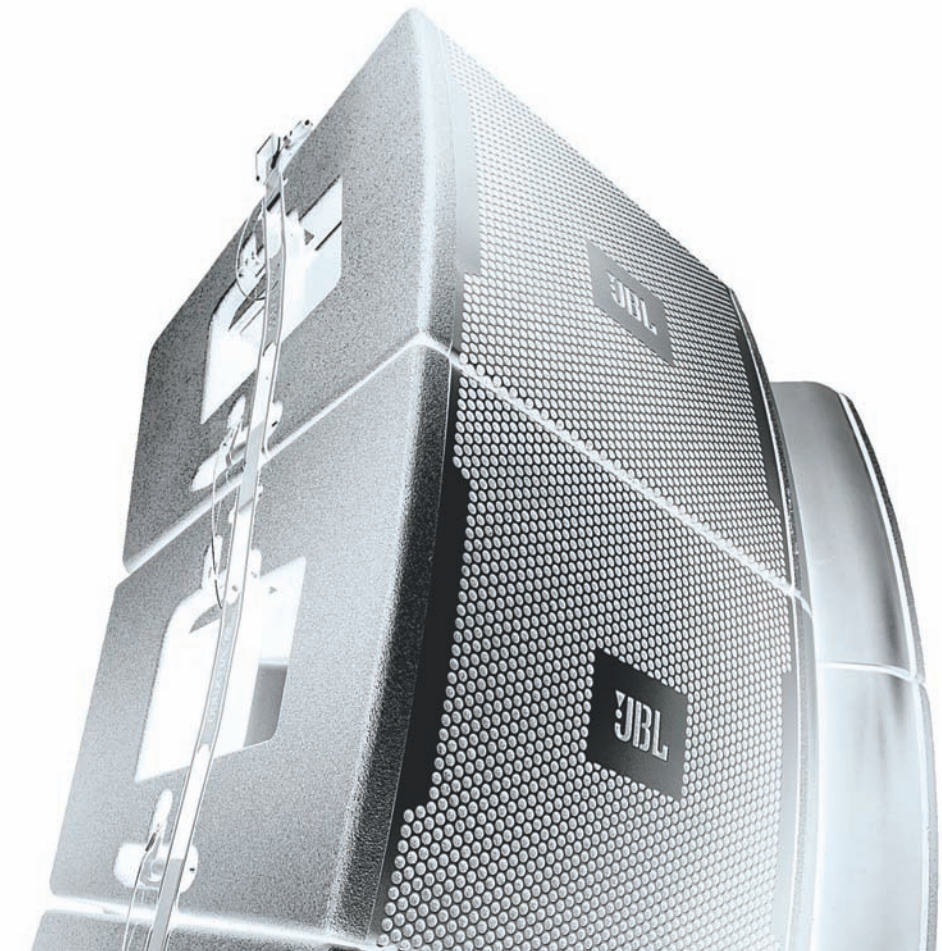
VRX900
SERIES

APPLICATION GUIDE



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THE VRX900 LINE ARRAY

Line arrays are acoustical sources placed closely together in a straight line. For practical reasons drivers are placed in enclosures which are configured vertically.

An advantage of a very large line array is that the sound level drops at about 3 dB per distance doubling. Conventional speaker level drops at 6 dB per distance doubling. This effect is frequency dependence, the longer a line arrays is the more of this desired effect will take place.

VRX900 line arrays benefit from some of these effects, but since they are small and compact, the results are not as pronounced.

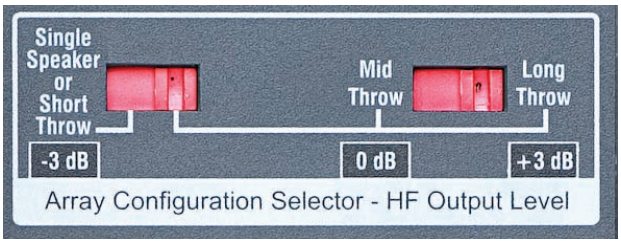
Each cabinet houses a curved waveguide with multiple HF drivers. They are set to a vertical angle of 15° and can be combined together to achieve the desired coverage.

Line arrays like JBL's VERTEC® can be configured to focus energy to reach distant areas by mechanically designating a straight portion (*usually the top*) of the hanging line array vs. a curved section (usually the end closer to the audience) which will result in less focused energy.

Since VRX900 does not provide the option of mechanically manipulating the angles between the cabinets, it has an ACS (*Amplitude Configuration Selector*) built in. The technique is called Amplitude Shading or Gain Shading and allows the adjustment of the HF levels for each cabinet.

When the ACS system is correctly set, a very homogenous sound field can be achieved. The level in front of the stage (*ACS = -3 dB*) will not be excessively loud. The far-reaching areas (*ACS = +3 dB*) will have adequate sound levels. Since the levels near the stage are lower in comparison to a conventional loudspeaker system, microphone feedback problems will be minimized.

Another advantage of line arrays are that their vertical directivity is high. This means that the sound can be aimed directly at the audience and the room acoustics will have less impact on the final listening experience. The sound operator has more control.



VRX900 SYSTEM SUGGESTIONS

A variety of system examples for the 8-inch VRX928LA (**SYSTEMS #1**-**#4**) and the 12-inch VRX932LA/P (**SYSTEMS #5**-**#8**) have been chosen in order to answer the most asked questions:

1. **HOW LARGE** of a crowd does a system cover?
2. **HOW FAR** does it throw?
3. **HOW LOUD** does it get?

The following selections are based on the most common combinations of VRX900 line array systems.

The applications shown, although generic, will be satisfactory under most conditions. However it cannot substitute an in depth evaluation based on exact conditions of a specific situation.

All examples provide at least 105 dB SPL, which is a common target for general music, and provide a very homogeneous (within 6 dB) coverage for a given audience area per number of speakers.

Example applications are based on EASE™ simulations of direct sound (*500 Hz - 4 kHz averaged*). The actual figures might be higher in a closed room. The approximated audience size is based on area size, (80 feet wide x listed depth, assumes a person occupies an area of 3' x 3' (0.9 m x 0.9 m).

The shown side views are illustrated with the VRX900 array tools. Since the array tools display only one possible array at a time, and don't consider the overlap of a second system, add 3 dB to get the shown results to match the EASE calculations.

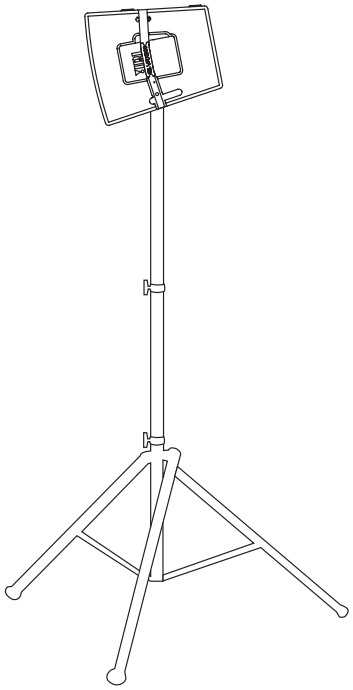
VRX928LA SYSTEM APPLICATION EXAMPLE #1

300 People SPL[1]: 103 to **107dB** maximum at **35ft. (11m)**

System Specification:

For 1x VRX928LA Per Side

- Coverage Per System: 100° x 15° (Horizontal x Vertical)
- Frequency Response (± 3 dB): 87 Hz - 19 kHz (without subwoofer)
  40 Hz - 19 kHz (with subwoofer)
- SPL[1]: 126 dB (1 Watt / 1 meter)
- One channel of power amplification of 650 - 1600 Watts at 8 Ohms (*Crown XTi 4000*, *I-Tech 6000*) per side
- Application Height: 7.5 ft. (2.3 m) via SS2-BK tripod
- ACS switch in -3 dB position



For applications with further low-frequency demand and for outdoor applications, add one VRX915S Subwoofer to each system for sufficient LF coverage.

Use one channel of amplifier power of 1200 - 3200 Watts at 4 Ohms (*Crown XTi 4000*, *I-Tech 6000*) per side

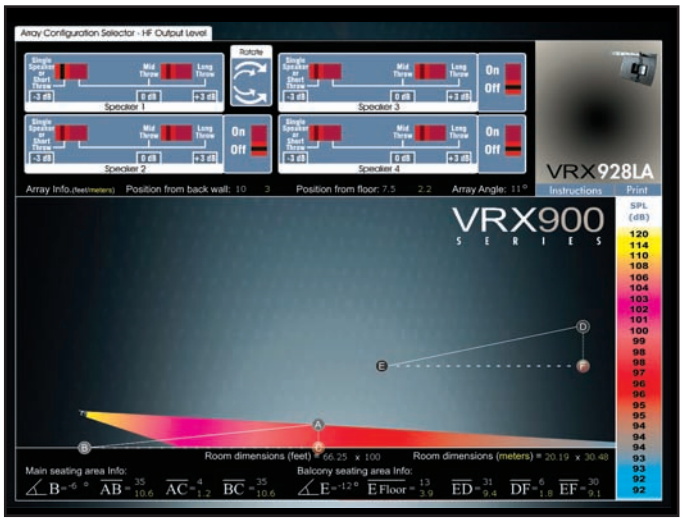
Tip: To achieve the best performance for the *VRX915S* subwoofer, add an EQ filter: Bell, 45 Hz, + 2.5 dB, Q: 2.5 and use an 80 Hz crossover point.

Sub / Sat wiring: For a Fast and Clean Setup we recommend the use of a 4 conductor NL4 to NL4 cable. Route pins +1 / -1 to the satellite speaker and pins +2/-2 to the subwoofer.

[1]: Represents program levels, might be up to 3 dB higher than indicated, when measured in peak hold mode.

Top view, two systems of 1x VRX928LA

Example Audience Area



Side view with one systems of 1x VRX928LA

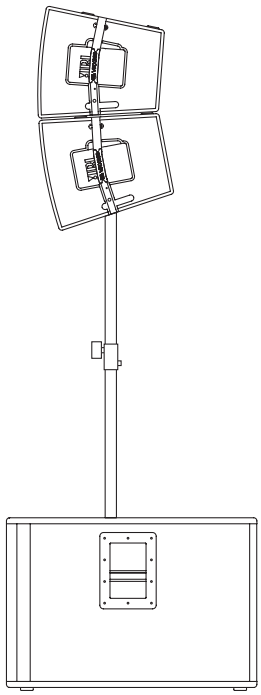
VRX928LA SYSTEM APPLICATION EXAMPLE #2

500 People SPL[1]: 105 to **110dB** maximum at **45 ft. (14 m)**

System Specification:

For 2x VRX928LA Per Side

- Coverage Per System: 100° x 30° (Horizontal x Vertical)
- Frequency Response (± 3 dB): 87 Hz - 19 kHz (without subwoofer)
  40 Hz - 19 kHz (with subwoofer)
- SPL[1]: 130 dB (1 Watt / 1 meter)
- One channel of power amplification of 1200 - 3200 Watts 4 Ohms (*Crown XTi 4000*, *I-Tech 6000*) per side
- Application Height: 8 ft. (2.4 m) via SS4-BK pole mount on top of one *VRX915S* Subwoofer
- ACS set to +3 dB for top speaker and -3 dB position for lower speaker.



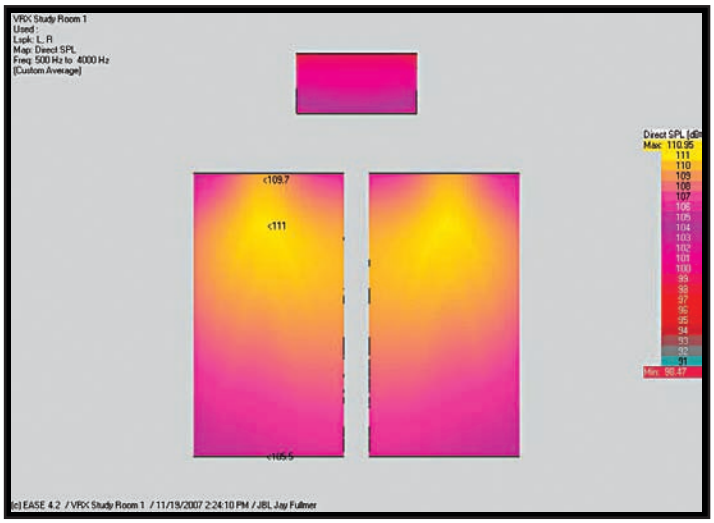
For application with further low-frequency demand and for outdoor applications, add one or two *VRX915S* Subwoofer to each system for sufficient LF coverage.

For two *VRX915S* subwoofers per side (wired in parallel) use one channel of amplifier power 3,000 - 6,400 Watts at 2 Ohms (*Crown I-Tech 8000*) or power each subwoofer individually with 1,200 - 3,200 Watts at 4 Ohms (*Crown XTi 4000*, *I-Tech 6000*).

Tip: To achieve the best performance for the *VRX915S* subwoofer add an EQ filter: Bell, 45 Hz, + 2.5 dB, Q: 2.5 and use a 80 Hz crossover point.

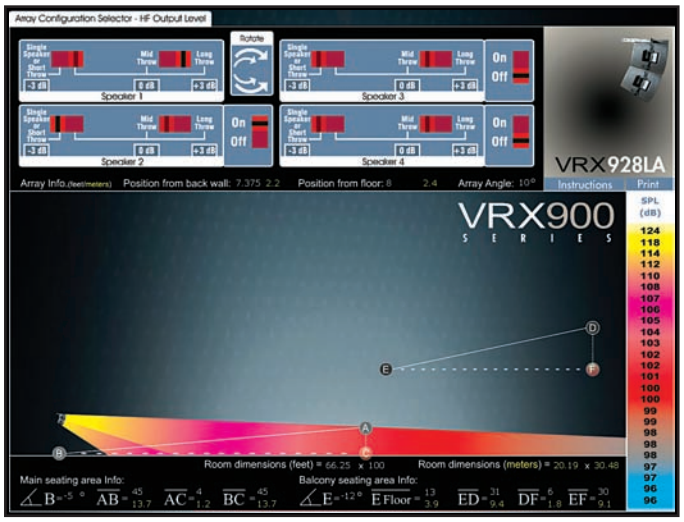
Sub / Sat wiring: For a Fast and Clean Setup we recommend the use of a 4 conductor NL4 to NL4 cable. Route pins +1/-1 to the satellite speaker and pins +2 / -2 to the subwoofer.

[1]: Represents program levels, might be up to 3 dB higher than indicated, when measured in peak hold mode.



Top view, two systems of 2x VRX928LA

Example Audience Area



Side view with one systems of 2x VRX928LA

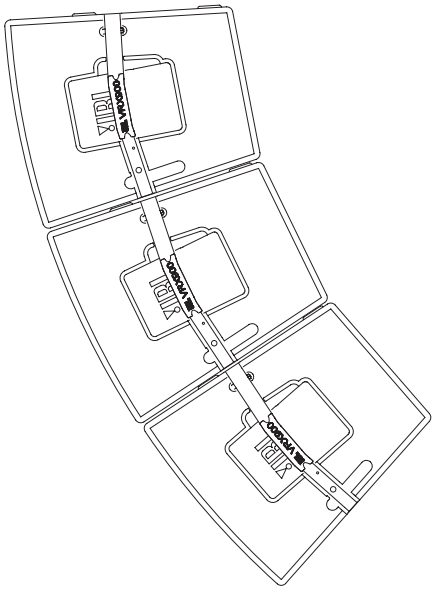
VRX928LA SYSTEM APPLICATION EXAMPLE #3

700 People SPL[1]: 102 to **108 dB** maximum at **65 ft. (20 m)**

System Specification:

For 3x VRX928LA Per Side

- Coverage per system: 100° x 45° (Horizontal x Vertical)
- Frequency Response (± 3 dB): 87 Hz - 19 kHz (without subwoofer)
  40 Hz - 19 kHz (with subwoofer)
- SPL[1]: 131 dB (1 Watt/1 meter)
- One channel of power amplification of 3,000 - 6,400 Watts at 3 Ohms (*Crown I-Tech 6000, I-Tech 8000*) per side
- Suspended[2] at 18 ft. (5.5 m)
- Three speakers wired in parallel and ACS set to +3 dB for top, 0 dB for middle and -3 dB position for lower speaker.

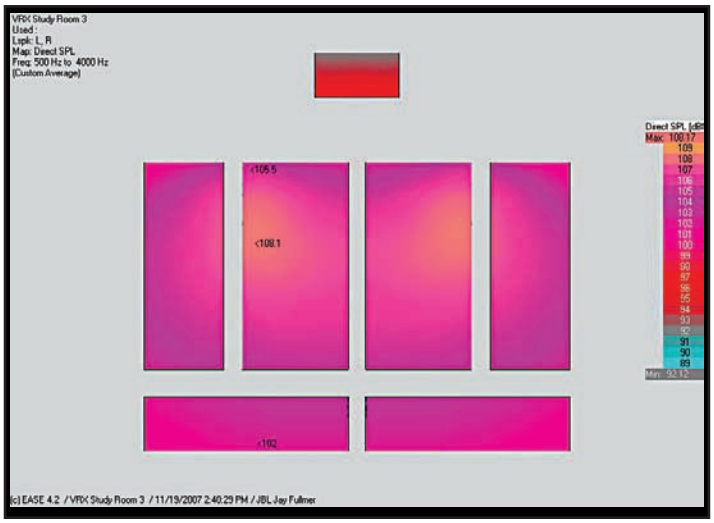


For applications with more low-frequency demand and in outdoor applications, add two *VRX915S* Subwoofer to each array for sufficient LF coverage.

For two *VRX915S* subwoofers per side (wired in parallel) use one channel of amplifier power 3,000 - 6,400 Watts at 2 Ohms (*Crown I-Tech 8000*) or power each subwoofer individually with 1,200 - 3,200 Watts at 4 Ohms (*Crown XTi 4000, I-Tech 6000*).

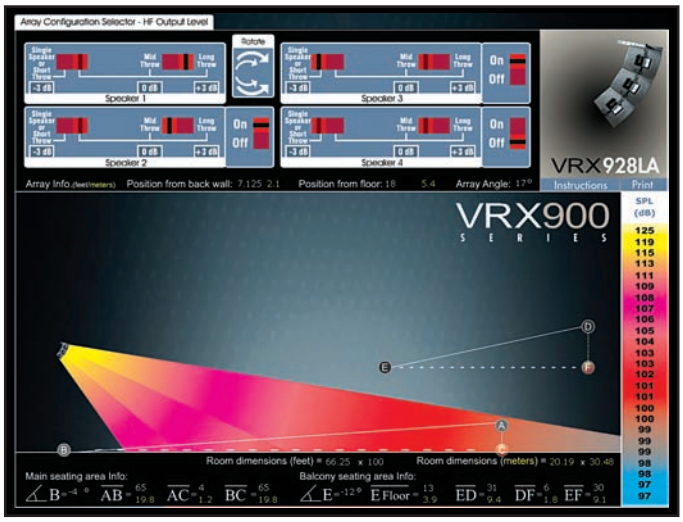
Tip: To achieve the best performance for the *VRX915S* subwoofer add an EQ filter: Bell, 45 Hz, + 2.5 dB, Q: 2.5 and use a 80 Hz crossover point.

[1] : Represents program levels, might be up to 3 dB higher than indicated, when measured in peak hold mode.
[2] : Please refer to VRX user guide for more information about safe rigging.



Top view, two systems of 3x VRX928LA

Example Audience Area



Side view with two systems of 3x VRX928LA

This Illustration shows clearly the advantages of amplitude shading (ACS)

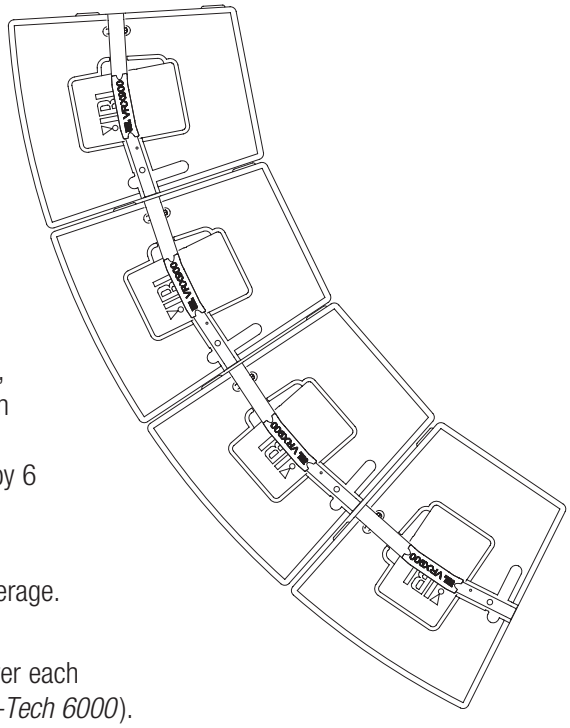
VRX928LA SYSTEM APPLICATION EXAMPLE #4

1000 People SPL[1]: 99 to **105 dB** maximum at: **100 ft. (30 m)**

System Specification:

For 4 x VRX928LA per side

- Coverage per system: 100° x 60° (Horizontal x Vertical)
- Frequency Response (± 3 dB): 87 Hz - 19 kHz (without subwoofer)
  40 Hz - 19 kHz (with subwoofer)
- SPL[1]: 132 dB (1 Watt /1 meter)
- Two channels of power amplification of 1,200 - 3,200 Watts at 4 Ohms (*Crown XTi 4000, I-Tech 6000*) per side
- Suspended[2] at 25 ft. (7.6 m)



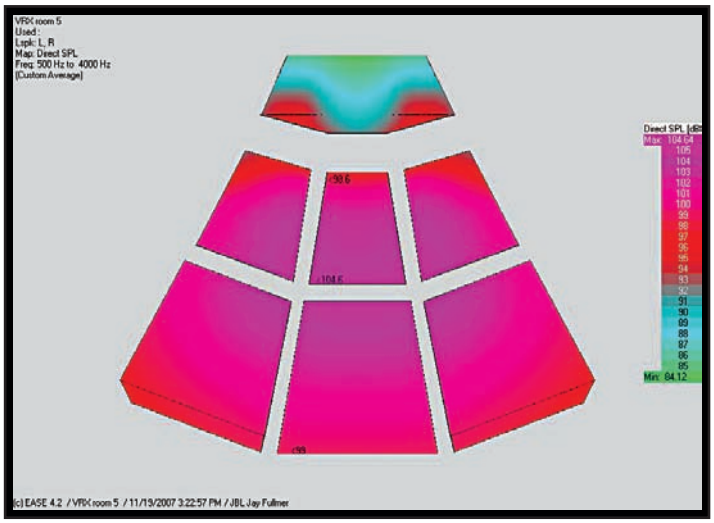
Note: In order to reach an even coverage, continuous array shading of +3 dB, 0 dB, -3 and -6 dB (*top to bottom*) was in place. This continuous shading can be achieved by using one amplifier channel for the two top speakers and one channel for the two bottom speakers and attenuating the lower speaker pair by 6 dB while setting the actual lower speakers ACS switches to +3 dB and 0 dB.

For applications with more low-frequency demand and in outdoor applications, add four *VRX915S* Subwoofer to each array for sufficient LF coverage.

For two *VRX915S* subwoofers per side (wired in parallel) use one channel of amplifier power 3,000 - 6,400 Watts at 2 Ohms (*Crown I-Tech 8000*) or power each subwoofer individually with 1,200 - 3,200 Watts at 4 Ohms (*Crown XTi 4000, I-Tech 6000*).

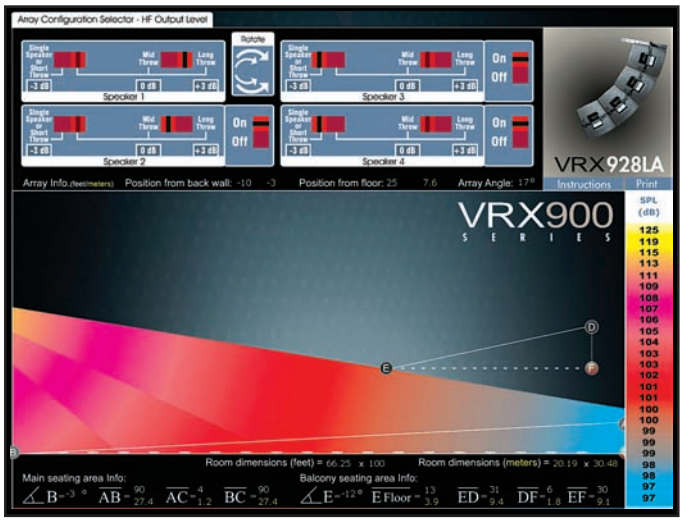
Tip: To achieve the best performance for the *VRX915S* subwoofer add an EQ filter: Bell, 45 Hz, + 2.5 dB, Q: 2.5 and use an 80 Hz crossover point.

[1] : Represents program levels, might be up to 3 dB higher than indicated, when measured in peak hold mode.
[2] : Please refer to VRX user guide for more information about safe rigging.



Top view, two systems of 4x VRX928LA

Example Audience Area



Side view with two systems of 4x VRX928LA

The array tool allows moving the speaker cluster outside of the window for placement in larger rooms.

VRX932LA SYSTEM APPLICATION EXAMPLE #5

300 People SPL[1]: 105 to **111dB** maximum at **35 ft. (11m)**

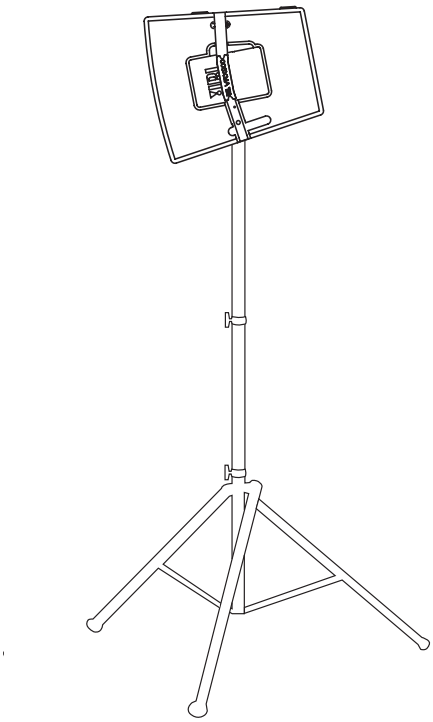
System Specification:

For 1x VRX932LA Per Side

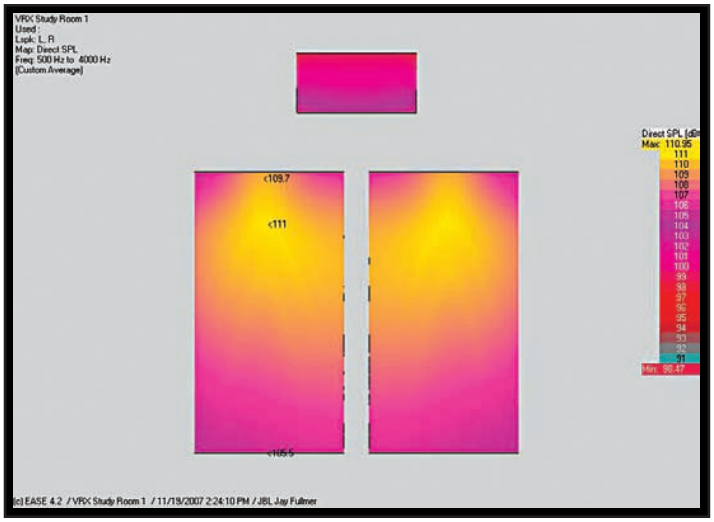
- Coverage per system: 100° x 15° (Horizontal x Vertical)
- Frequency Response (± 3 dB): 75 Hz - 20 kHz (without subwoofer)
  34 Hz - 20 kHz (with subwoofer)
- SPL[1]: 133 dB (1 Watt/1 meter)
- Application Height: 7.5 ft. (2.3 m) via SS2-BK tripod
- One channel of power amplification of 1,500 - 3200 Watts at 8 Ohms (*Crown I-Tech 6000, I-Tech 8000*) per side
- ACS switch in -3 dB position

For applications with further low-frequency demand and in outdoor applications, add one *VRX918S* Subwoofer to each system for sufficient LF coverage.

Use two channels of amplifier power of 1,500 - 3,200 Watts at 8 Ohms (*Crown I-Tech 6000*) for best results.

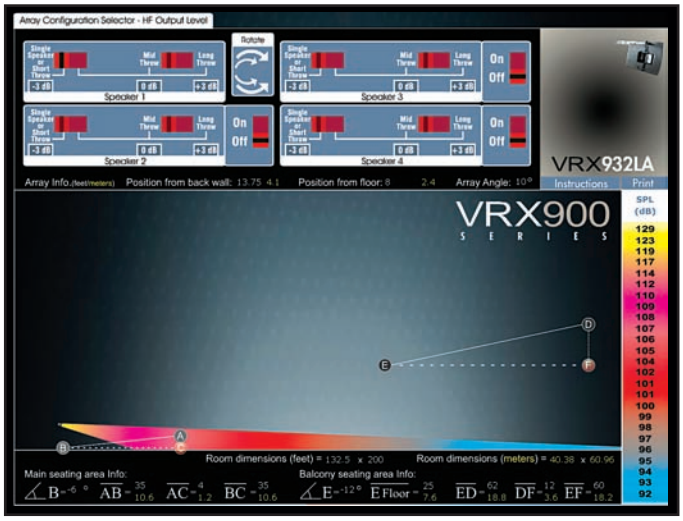


[1]: Represents program levels, might be up to 3 dB higher than indicated, when measured in peak hold mode.



Top view, two systems of 1x VRX932LA

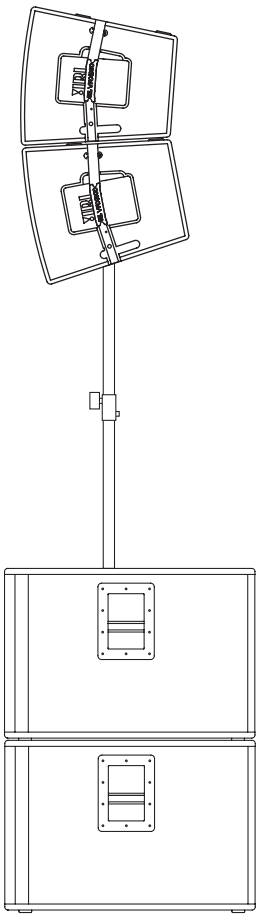
Example audience area



Side view with two systems of 1x VRX932LA

VRX932LA SYSTEM APPLICATION EXAMPLE #6

500 People SPL[1]: 111 to **117dB** maximum at **45 ft. (14 m)**



System Specification:

For 2 x VRX932LA Per Side

- Coverage Per System: 100° x 30° (Horizontal x Vertical)
- Frequency Response (± 3 dB): 75 Hz - 20 kHz (without subwoofer)
  34 Hz - 20 kHz (with subwoofer)
- SPL[1]: 138 dB (1 Watt / 1 meter)
- Application Height: 8 ft. (2.4 m) via SS4-BK pole mount on top of Subwoofer
- One channel of power amplification of 3,000 - 6,400 Watts at 4 Ohms (*Crown I-Tech 6000, I-Tech 8000*) per side
- ACS set to +3 dB for top speaker and -3 dB position for lower speaker.

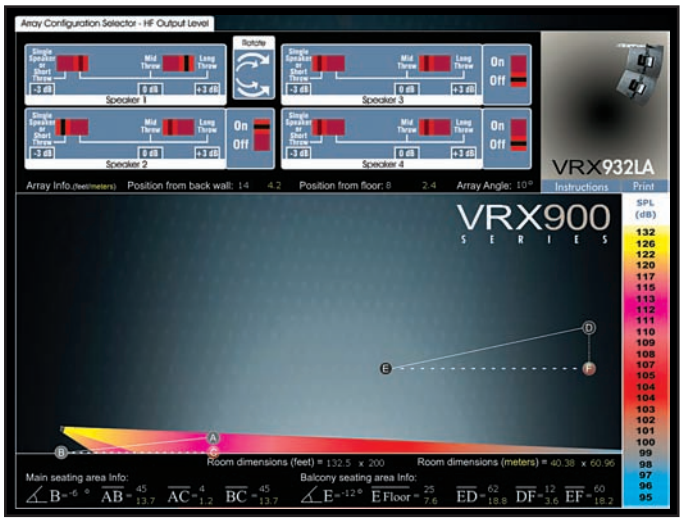
For application with higher low-frequency demand and in outdoors application, add one or two *VRX918S* Subwoofer to each system for sufficient LF coverage. Use one channel of amplifier power from 1,500 - 3,200 Watts at 8 Ohms (*Crown I-Tech 6000*) for single subwoofer or a power amplification of 3,200 - 6,400 Watts /4 Ohms (*Crown I-Tech 6000, I-Tech 8000*) when utilizing two *VRX918S* subwoofers in parallel for each system.

Sub / Sat wiring: For a fast and clean setup we recommend the use of a 4 conductor NL4 to NL4 cable. Route pins +1 / -1 to the satellite speaker and pins +2 / -2 to the subwoofer.

[1]: Represents program levels, might be up to 3 dB higher than indicated, when measured in peak hold mode.

Top view, two systems of 4x VRX928LA

Example audience area



Side view 2x VRX932LA

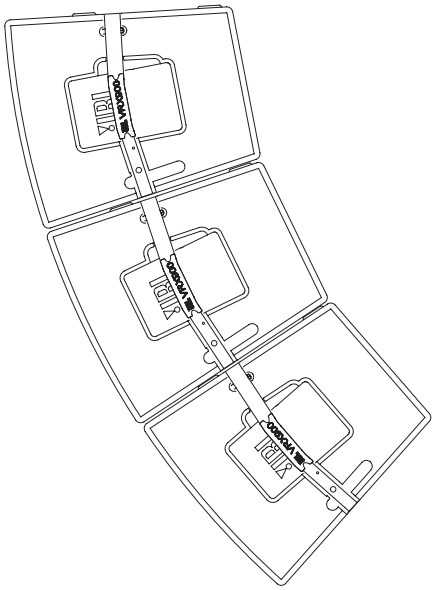
VRX932LA SYSTEM APPLICATION EXAMPLE #7

700 People SPL[1]: 105 to **111dB** maximum at **65 ft. (20 m)**

System Specification:

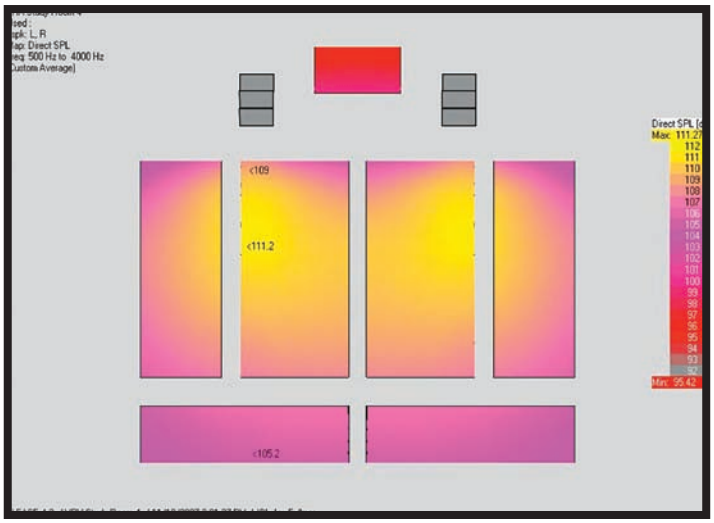
For 3 x VRX932LA per side

- Coverage per system: 100° x 45° (Horizontal x Vertical)
- SPL[1]: 139 dB (1 Watt / 1 meter)
- Frequency Response (+/- 3 dB): 75 Hz - 20 kHz (without subwoofer)
  34 Hz - 20 kHz (with subwoofer)
- Suspended[2] at 18 ft. (5.5 m)
- One channel of power amplification of 3,600 - 9,600 Watts at 3 Ohms (*Crown I-Tech 8000*) per side
- Three speakers wired in parallel and ACS set to +3 dB for top, 0 dB for middle and -3 dB position for lower speaker.

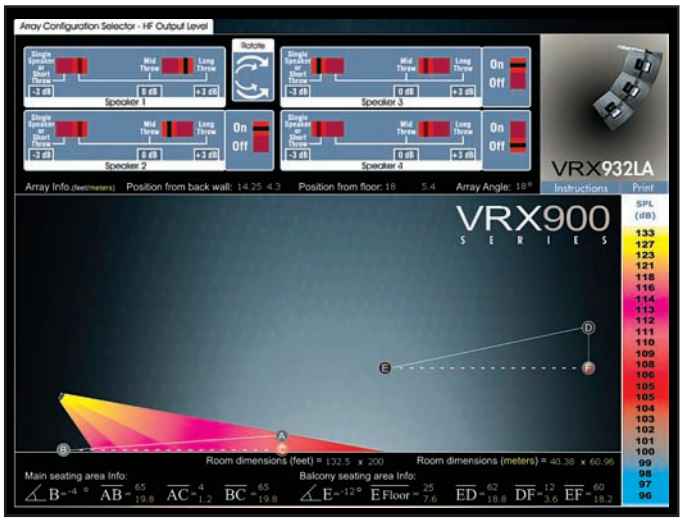


For application with additional low-frequency demand and in outdoor applications add two or three VRX918S Subwoofer to each system for sufficient LF coverage. For two VRX918S subwoofers per side (wired in parallel) use one channel of amplifier power 3,000 - 6,400 Watts/4 Ohms (*Crown I-Tech 6000, I-Tech 8000*).

[1] : Represents program levels, might be up to 3 dB higher than indicated, when measured in peak hold mode.
[2] : Please refer to VRX user guide for more information about safe rigging.



Top view, two systems of 3x VRX932LA:
Example audience area



3x VRX932LA

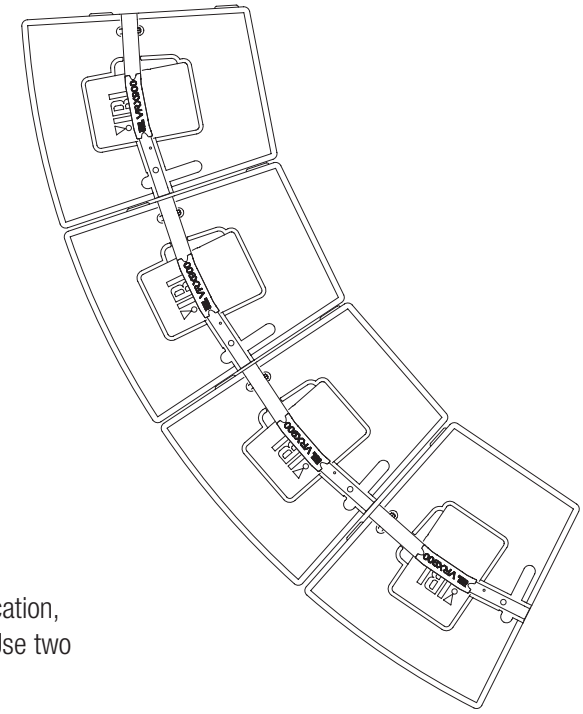
VRX932LA SYSTEM APPLICATION EXAMPLE #8

1000 People SPL[1]: 105 to **111 dB** maximum at **100** ft. (30 m)

System Specification:

For 4 x VRX932LA Per Side

- Coverage per system: 100° x 60° (Horizontal x Vertical)
- SPL[1] : 141 dB (1 Watt / 1 meter)
- Frequency Response (± 3 dB): 75 Hz - 20 kHz (without subwoofer)
  34 Hz - 20 kHz (with subwoofer)
- Suspended[2] at 25 ft (8 m)
- Power requirements: Two channels of power amplification with minimum of 3000 Watts at 4 Ohms (*Crown I-Tech 6000*) per side

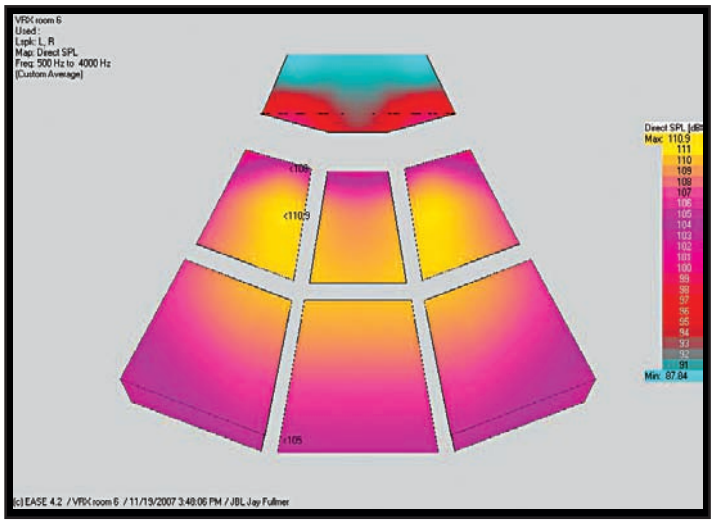


Note: In order to achieve an even coverage, continuous array shading of +3 dB, 0 dB, -3 and -6 dB (top to bottom) was in place. This continuous shading can be accomplished by using one amplifier channel for the two top speakers and one channel for the two bottom speakers and attenuating the lower speaker pair by 6 dB while setting the actual lower speakers ACS switches to +3 dB and 0 dB.

For application with additional low-frequency demand and in outdoors application, add 2 - 4 *VRX918S* Subwoofer to each system for sufficient LF coverage. Use two *VRX918S* in parallel for best efficiency and economy!

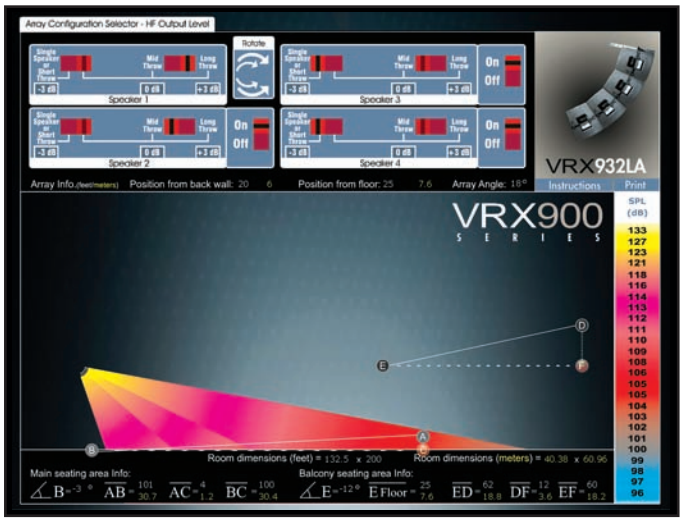
Use one channel of amplifier power with a minimum of 3000 Watts / 4 Ohms (*Crown I-Tech 6000*) for two *VRX918S* wired in parallel, per side

[1] : Represents program levels, might be up to 3 dB higher than indicated, when measured in peak hold mode.
[2] : Please refer to VRX user guide for more information about safe rigging.



Top view, two systems of 4x VRX932LA:

Example audience area. Please notice the low level at the stage and the even distribution of energy.



Side view 4x VRX932LA:

Using the array tool shows the effect of ACS.

Note: The lowest hanging speaker could not be attenuated with the array tool - please subtract 3 dB for the effected region.

VRX900 ACCESSORIES

Optional array frames attach to the integrated rigging hardware of each enclosure providing an easy to use, elegant suspension system for flown arrays. A second array frame may be installed at the bottom of an array for applications where the system must be aimed down sharply.

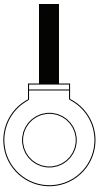
1 **VRX-AF**: for VRX932LA, VRX932LA-1/P, VRX918S/P
VRX-SMAF: for VRX928LA, VRX915S
Please refer to your user guide for suspension guidelines, maximum allowable array size and more.
(www.jblpro.com/products/portablesound/vrx)

2 **SS4-BK**
The **Adjustable Pole Mounts** to a 20 mm flange on top of the VRX900 subwoofers. It contains a “wedge” ring, which fills out a possible gap between the pole and the socket for more wobble free deployment of the top speakers.
Weight: 2.7 kg
Adjustable from 35.5 in - 57 in (905 mm - 1450 mm)

3 **SS2-BK**
The **Tripod** stand allows the employment of up to two line-array speakers.
Weight: 3.5 kg
Adjustable from 54 in - 89 in (1380 mm - 2260 mm)

4 **WK-4S**
Wheel Kit for subwoofer VRX918S/P and VRX915S contains four 3 in. swivel casters with anti rattle shim. Mounting hardware included.

5 **SRX718S-CVR**
Protective Cover for VRX918S/P and SRX718S with extra protection in grille area will fit when wheel kit is mounted.



6 **#229-00009-01** kit contains 3 pieces M10 x 35 mm forged steel shoulder bolts. A M10 eyebolt kit is available as an alternative to array frames.

The majority of VRX900 owners use their systems in passive mode. If you want to operate your system in bi-amp mode, please visit our website **www.jblpro.com/tunings/index.htm** for the latest processor tunings.

Please note that when operated in bi-amp mode, the VRX932LA-1 requires a unique DSP preset that is different from the preset required for bi-amplified operation of the VRX932LA. When operated in bi-amp mode, VRX932LA and VRX932LA-1 performance is fully compatible provided that the correct preset is used for processing the respective models.

Matrix of electronic product support files for VRX900

Currently posted processor tuning data: *4/9/2008*

	DSC 280/260	dbx DR 260	dbx DR PA	dbx DR480	dbx DR4800	Crown I-Tech	Crown XTi	BSS 366	BSS London Lake	
VRX932LA										
1x bi-amp fullrange		• pdf	wizard/firmware	• pdf	•	• pdf	•	pdf		
1x bi-amp VRX918S		• pdf	wizard/firmware	•	•	•				
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3x bi-amp fullrange		• pdf	pdf	• pdf	• pdf	• pdf	• pdf	• pdf	• pdf	• pdf

Infrasonic Filter Settings:
It is a good practice to use High Pass Filter (*HPF*) to prevent frequencies below the system tuning frequency from reaching the speaker. Sending these infrasonic signals to the speaker will not result in any appreciable acoustical output, but will put unnecessary stress on the woofer and reduce available amplifier headroom. A High Pass Filter will protect your VRX900 system from excess infrasonic energy with little, if any loss of significant program content.

Model	HPF 24 dB/octave
VRX932LA-1	60 Hz
VRX928LA	80 Hz
VRX918S	40 Hz
VRX915S	45 Hz

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