

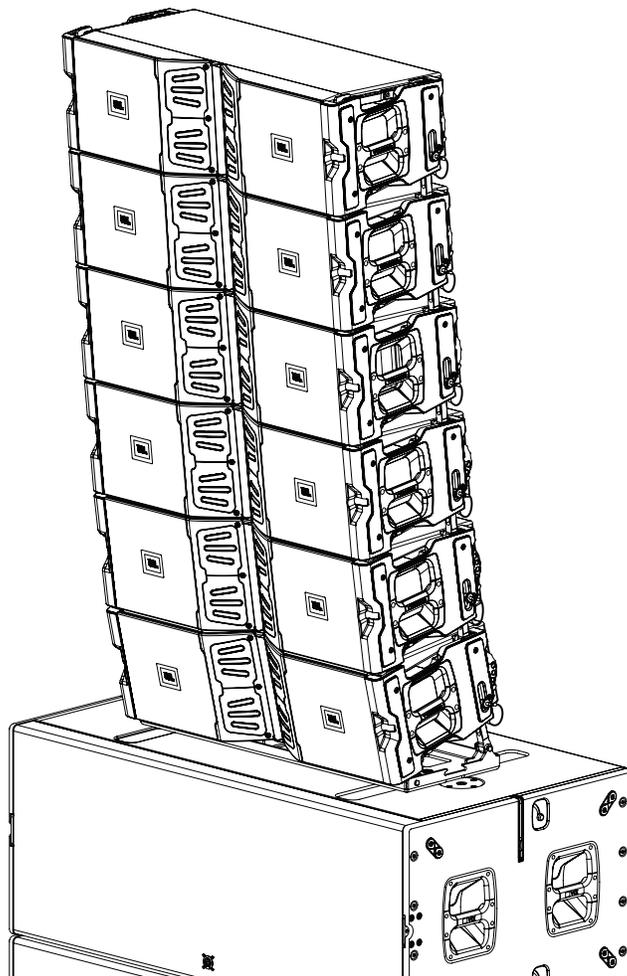


JBL

PROFESSIONAL

VTX SERIES
SYSTEM SOLUTIONS

VTX V20 BP | Quick Start Guide



GENERAL INFORMATION

VTX V20 BP - Quick Start Guide

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TABLE OF CONTENTS

1 - SAFETY	4
1.1 Safety Instructions	4
1.2 General Hardware Information	4
1.3 Attachment to Structures	4
1.4 Important Safety Warning	5
1.5 Are You New to Rigging?	5
1.6 Inspection and Maintenance	5
1.7 Symbols	6
2 - MECHANICAL LIMITS	7
2.1 VTX V20 Limits - Ground Stacked	7
3 - SOFTWARE	8
3.1 Line Array Calculator 3™	8
3.2 Ground-Stacked Arrays in LAC-3	9
4 - VTX V20 BASE PLATE	10
4.1 Overview	10
4.2 Selecting Angles	11
5 - ASSEMBLING GROUND-STACKED ARRAYS	12
5.1 Selecting Angles	12
5.2 Compression VS Tension	15
5.3 Ground Stack Examples	16
6 - ATTACHING THE BASE PLATE ONTO A STRUCTURE	17
7 - SPECIFICATIONS	18
7.1 VTX V20 BP	18
8 - CONTACT INFORMATION	19

1 - SAFETY

1.1 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 if liquid has been spilled or objects have fallen into the apparatus, or if 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.

1.2 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. Compliant hardware will be referenced with a working load limit (WLL) and a traceability code.

1.3 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.

1.4 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.

1.5 ARE YOU NEW TO RIGGING?

If you are new to rigging, you should:

- Know the rules for safe rigging.
- Attend a safe rigging seminar.
- Meet and establish a relationship with a licensed mechanical or structural engineer. Get in the habit of asking them questions instead of assuming their answers. Learn from what they tell you.
- Research and understand the codes, practices and requirements of the venues where you intend to operate your sound system.

1.6 INSPECTION AND MAINTENANCE

Suspension systems are comprised of mechanical devices and, as such, 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 a speaker until the proper corrective action has been taken.

Installed systems should be inspected at least once a year. The inspection must include a visual survey of all corners and load-bearing surfaces for signs of cracking, water damage, delamination, 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 once a year or as required by local ordinance. The inspection must 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 must 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.

1.7 SYMBOLS

The following 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.

2 - MECHANICAL LIMITS

VTX systems and accessories comply with the 2006/42/EC Machinery Directive and have been designed following the guidelines of DGUV regulation 17 (BGV C1) for a minimum safety factor of 4:1. Minimum safety factor requirements for suspended arrays are often set by local regulations. Use the JBL Line Array Calculator™ software to check mechanical limits and ensure compliance with local regulations. ANSI Standard E1.8 (Entertainment Technology Loudspeaker Enclosures Intended for Overhead Suspension), Section 5.3.4, specifies a minimum safety factor of 5:1. If compliance with the ANSI standard is needed, make sure that the array design produces a minimum safety factor of 5:1.

2.1 VTX V20 LIMITS - GROUND STACKED

ARRAY FRAME	NOTES	SAFE LIMIT	MAXIMUM LIMIT
VTX V20 BP	Base plate for ground stacking V20 systems	(1) V20	(6) V20

TERMINOLOGY:

Safe Limit: The safe limit provides the number of cabinets that can be used in an array while maintaining a safety factor of 4:1 or higher. The safety factor of an array is determined by the number of cabinets, the array shape, and the overall array angle. An array constructed within the safe limit will always yield a safety factor greater than 4:1 regardless of array parameters and conditions. Ground stacked arrays within the safe limit are stable under normal conditions. Designs exceeding the safe limit and up to the maximum limit, are possible, but the JBL Line Array Calculator™ software should be used to check mechanical safety for the given configuration.

Maximum Limit: Arrays larger than the maximum limit are not allowable under any conditions.

NOTES:

- When the safe limit and maximum limit are the same, the array always produces a safety factor of 4:1 or higher.
- Safe and maximum limits are only applicable to the specified accessory (i.e. base plate or array frame). When several accessories are combined (for example, ground-stacked arrays with a base plate and subwoofers underneath), the design should always be evaluated and checked with LAC-3.
- LAC-3 will not allow array designs below the 4:1 minimum safety factor.

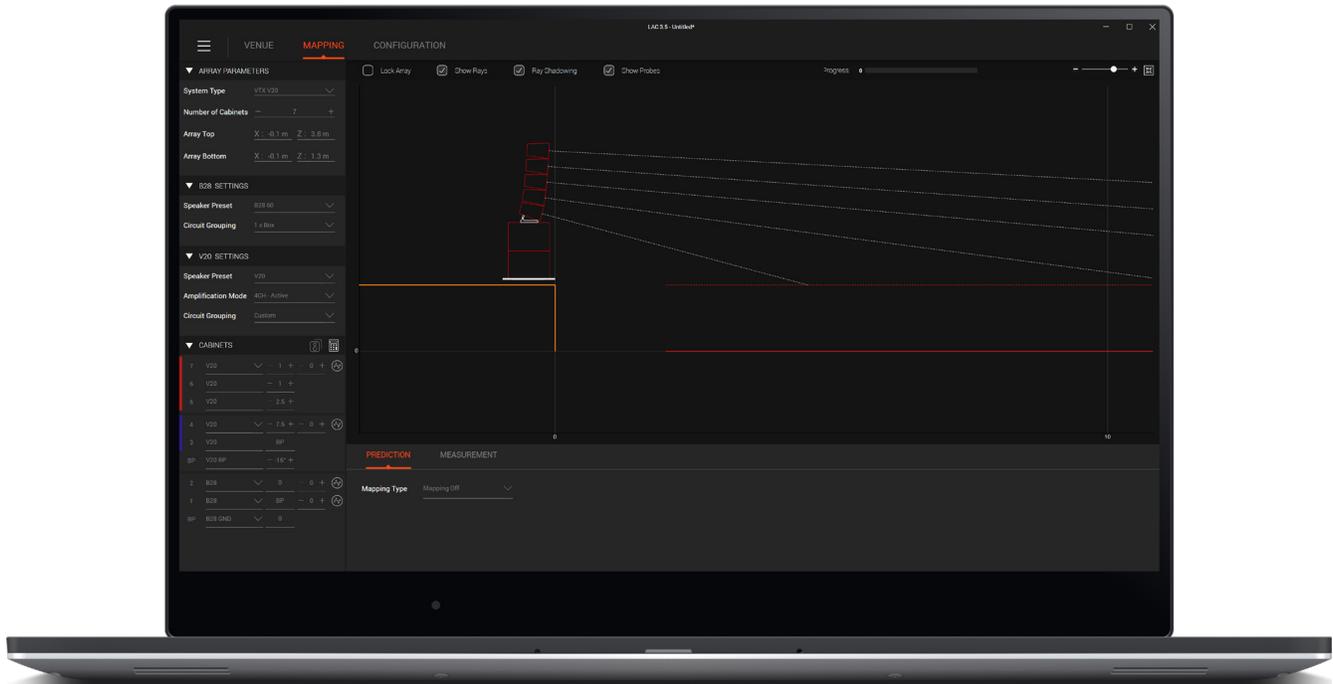


CAUTION: Limits for ground-stacked arrays always assume that the stacking surface (floor or stage) is flat . Do not deploy ground-stacked arrays on non-flat surfaces to avoid tipping hazards .

3 - SOFTWARE

3.1 LINE ARRAY CALCULATOR 3™

Line Array Calculator 3 acoustical prediction software is used for the design and mechanical validation of VTX series line array systems. Using LAC-3 is a three-step process. First, venue dimensions are defined using either X/Y/Z coordinates or the fast distance/angle method. Second, array configurations are built from VTX loudspeaker models. Third, virtual measurement microphones and a suite of built-in DSP functions are applied to make predictions of the system's coverage and the linearity that will be delivered by the defined array configuration in the specified space. Loudspeaker quantities and models, splay angles, and array aiming can be modified until prediction shows that the desired coverage is attained throughout the venue. The built-in coverage-and-delay calculator determines subwoofer delay values for electronic delay steering (EDS) that achieves optimal low frequency coverage.



Beyond acoustical predictions, LAC-3 validates the mechanical properties of arrays and selected JBL accessories. Configuration limits are calculated in real time, for either suspended or ground-stacked arrays, based on array parameters such as the number of cabinets, cabinet-to-cabinet splay angles, overall array aiming, and selected accessories. In the case of suspended arrays, a safety factor is calculated to aid in designing systems that conform to local regulations. Warnings and error messages notify the user when an array or a specific accessory is outside safe working limits. For ground-stacked arrays, a tipping factor calculated from a complex set of variables suggests whether an array design is likely to be stable, potentially unstable, or unsafe. Array statistics like array size, depth, and weight are also calculated, and a PDF report facilitates system deployment. Mechanical data can be transferred to JBL's Array Link™ app running on an iOS® or Android mobile phone using a QR code, with no need for Internet connectivity. All relevant rigging information and options are presented in an easy-to-understand layout.



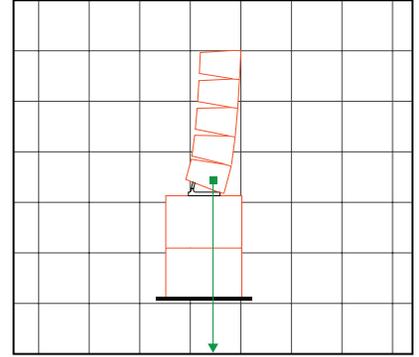
CAUTION: All VTX systems should be designed and validated using the LAC-3 software application. This is the only way to ensure that safe mechanical conditions are met for any given configuration.

3.2 GROUND-STACKED ARRAYS IN LAC-3

Line Array Calculator version 3.5.0 or later includes mechanical safety checks for ground-stacked arrays. The software takes into consideration several variables that can affect the stability of an array, including outside factors such as someone pushing on an array. Based on this data, LAC-3 generates a safety assessment factor and notifies the user of potential mechanical or stability problems. Errors and warnings generated fall into one of the following categories:

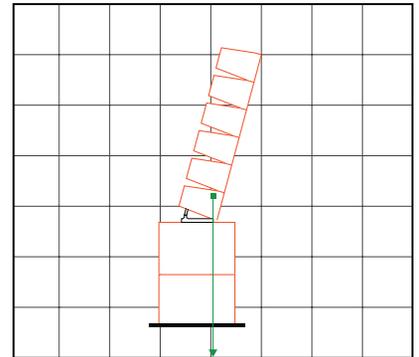
No errors or messages

In this case, the array is stable under normal conditions and can be used as is. The array also complies with the mechanical limits set by JBL for the speakers and selected accessories.



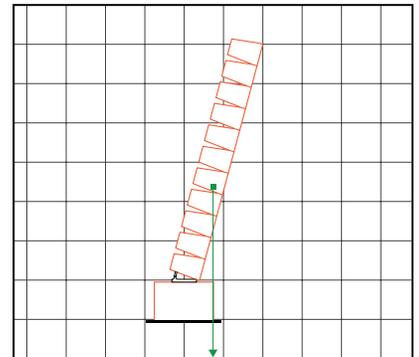
WARNING: Stability Hazard! - Stack Could Become Unstable - Secure to Ground

This message is an alert that the array is potentially unstable and a tipping hazard condition has been detected. The user is responsible for securing the array to the ground, stage, or other structure that can provide additional support and is rated for the weight of the array. This message may also be warning of external factors that can influence stability, such as someone accidentally pushing the array.



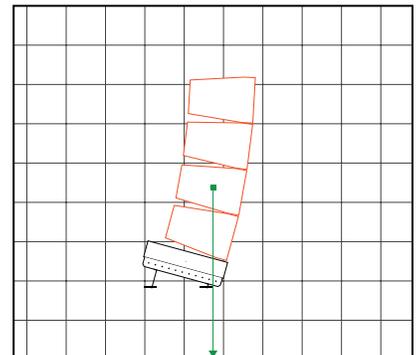
Configuration exceeds the maximum number of boxes allowed

This message is presented when the specified array design exceeds the mechanical limits set by the JBL team for the speakers or selected accessories. Array designs that trigger this message should not be used under any conditions, as they can lead to hardware damage and/or injury.



Invalid CG Location

This message is presented when the Center of Gravity of an array design exceeds the footprint of the selected accessory. Array designs that trigger this message should not be used under any conditions, as they can lead to hardware damage and/or injury.

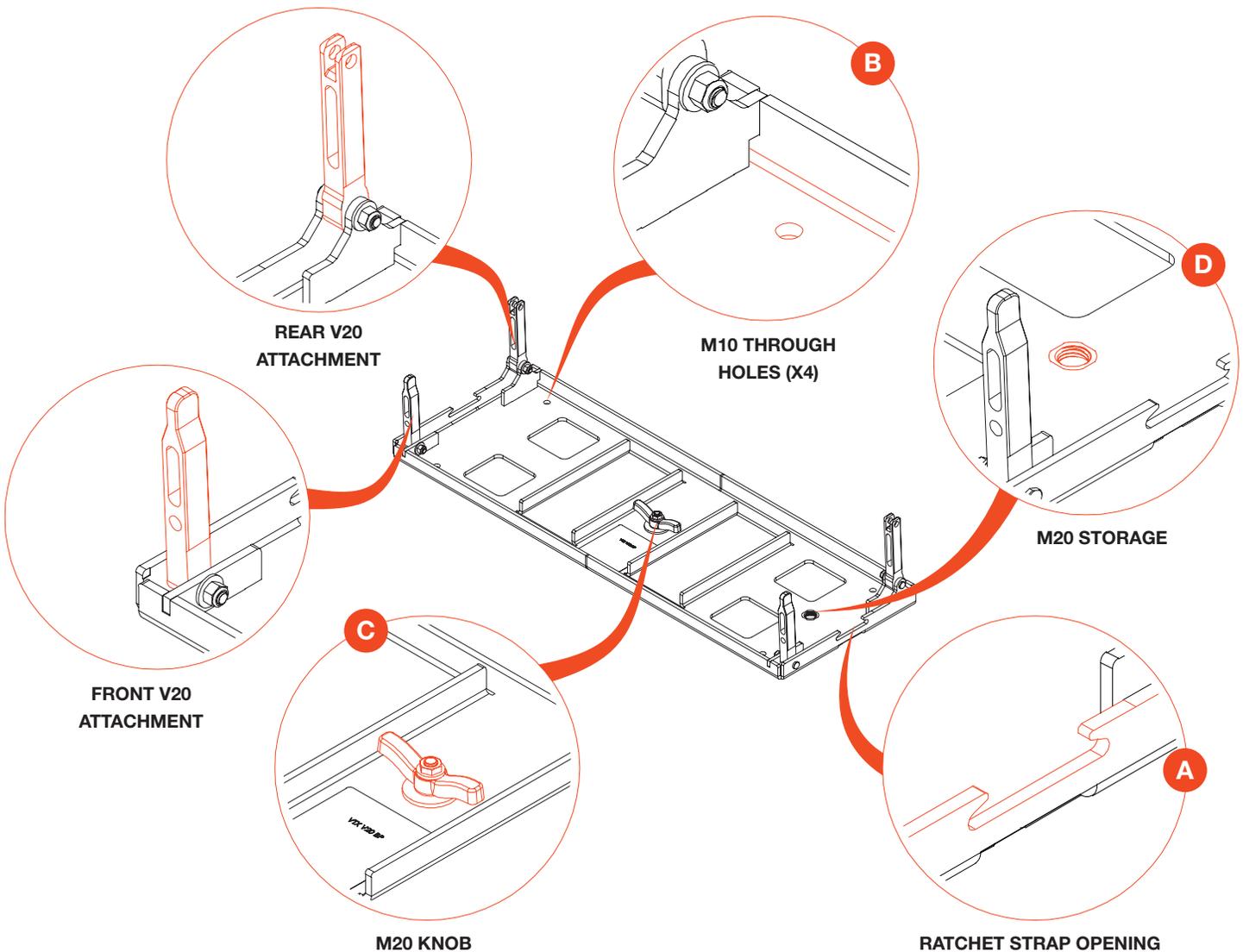


● Center of Gravity

4 - VTX V20 BASE PLATE

The VTX V20 Base Plate is a universal adapter frame that enables VTX V20 arrays to be ground stacked on top of compatible subwoofers or support structures such as stages, scaffolding, or carts. Using the included M20 screw, the VTX V20 BP connects to any supported subwoofer equipped with a standard M20 pole mount adapter, such as the VTX B28 or the VTX S25. The base plate attaches directly to the bottom of a V20 array, and the array angle is set by the V20 cabinet connected to the base plate. When not used with subwoofers, M10 through-holes at the four corners can be used to permanently attach a V20 array to other support structures.

4.1 OVERVIEW

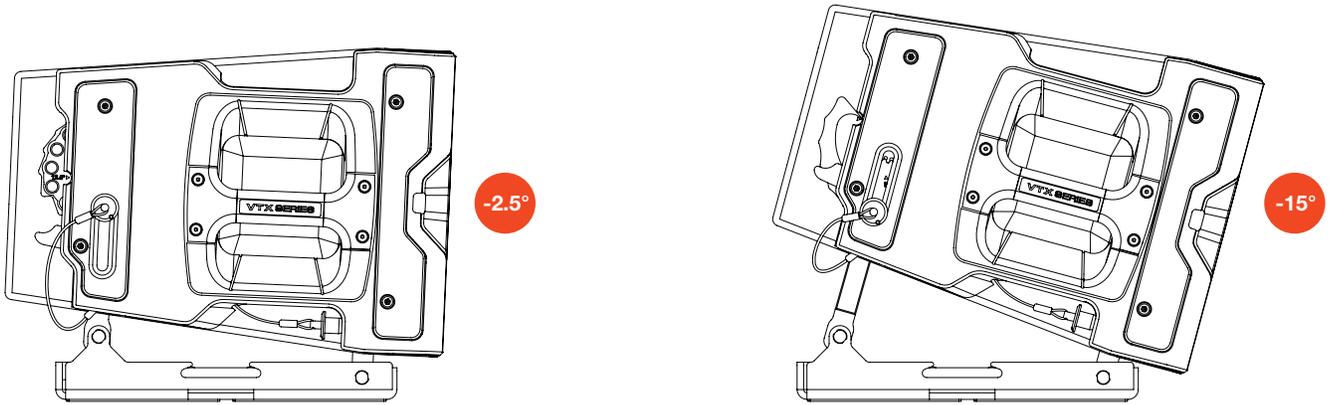


NOTES:

- A** Ratchet strap opening can be used to secure the ground-stacked array to a structure to avoid tipping.
- B** Four M10-sized screws can be used to secure the base plate onto a fixed structure (like a stage or a cart) for permanent installation.
- C** An M20 knob and screw attach the base plate onto supported VTX subwoofers like the VTX B18, VTX B28 and VTX S25.
- D** Storage position for the M20 knob.

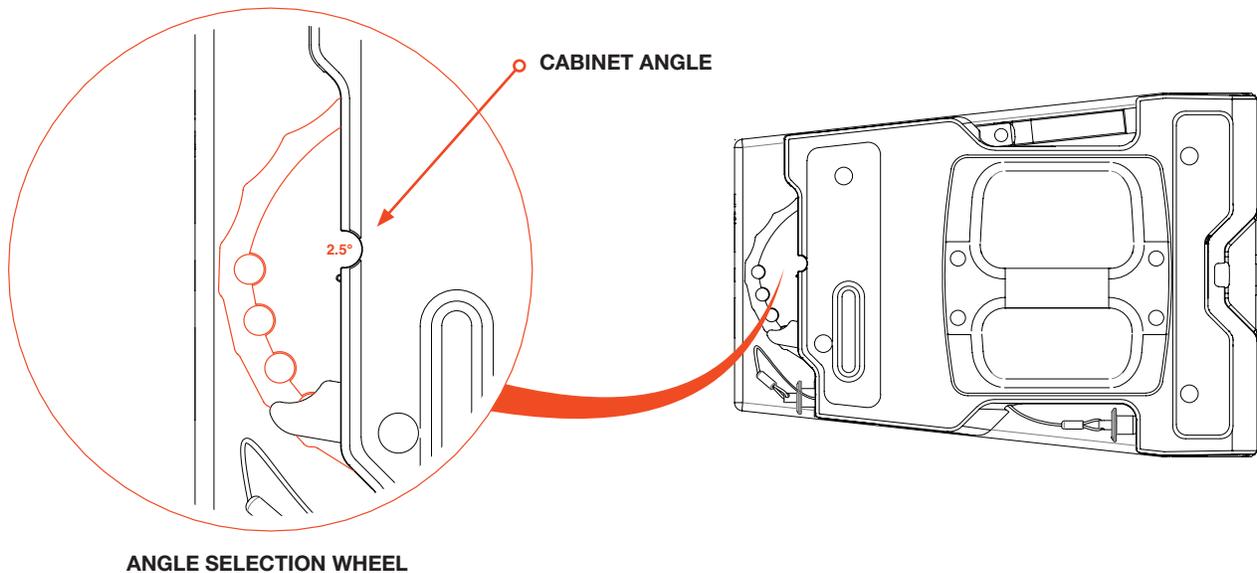
4.2 SELECTING ANGLES

The V20 base plate can provide from 0 to -12.5 degrees of tilt, which is supplemented by a built-in -2.5 degree offset to increase the maximum down angle of an array. This gives a V20 ground-stacked array an overall angle ranging from -15 to -2.5 degrees, which is set by the Angle Selection Wheel of the V20 cabinet connected to the base plate. For example, selecting 0° on the first cabinet will set the array to a -15-degree down angle. Below is a table showing all the possible angles.



V20	0°	0.5°	0.75°	1°	1.5°	2°	2.5°	3°	4°	5°	7.5°	10°	12.5°
Actual	-15°	-14.5°	-14.25°	-14°	-13.5°	-13°	-12.5°	-12°	-11°	-10°	-7.5°	-5°	-2.5°

To calculate the array down angle, add the value selected on the V20 Angle Selection Wheel to -15. For example, for a V20 set to 12.5° the calculation is: $-15 + 12.5 = -2.5$.



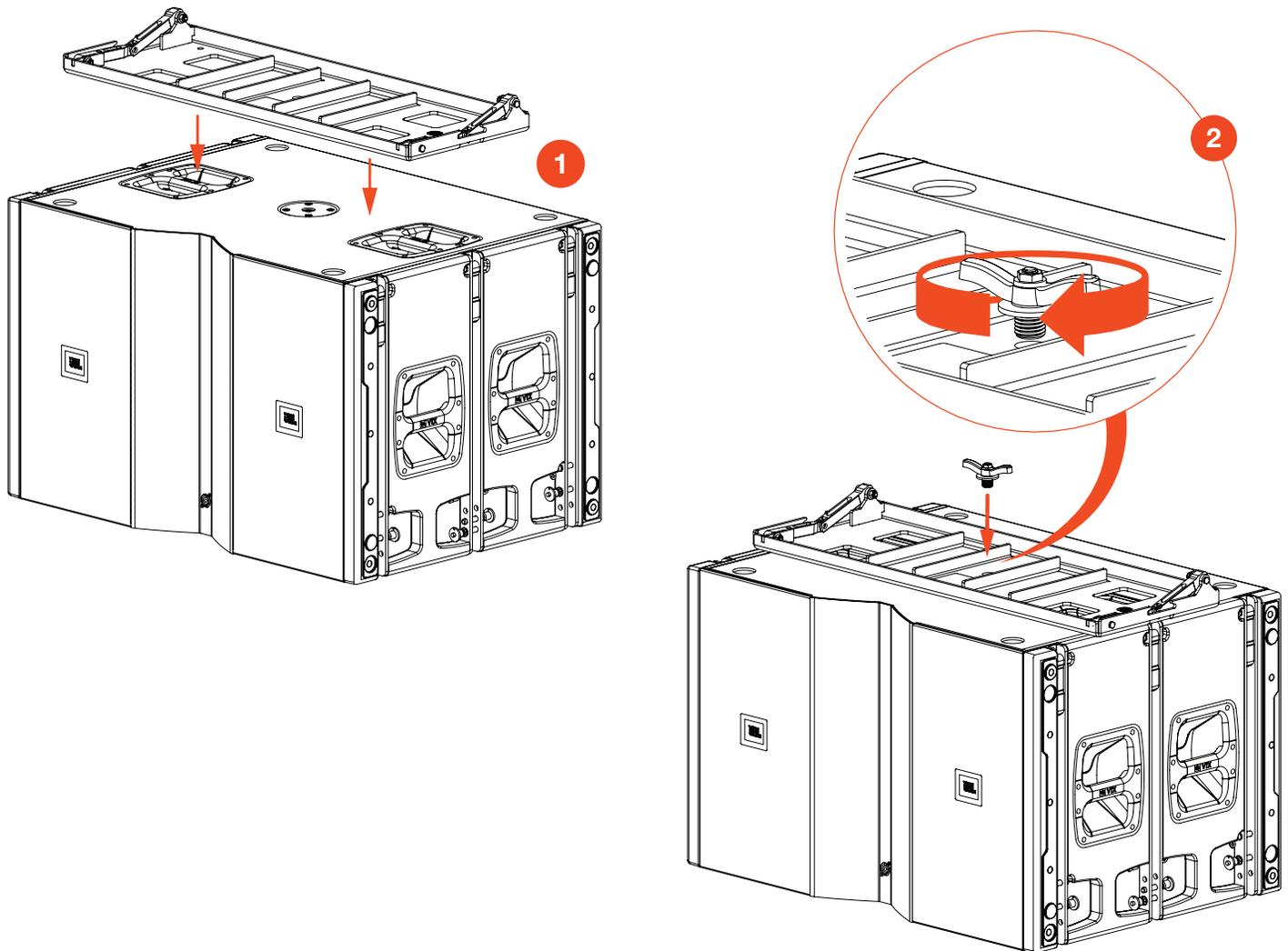
5 - ASSEMBLING GROUND-STACKED ARRAYS

5.1 SELECTING ANGLES

Before attaching the base plate, assemble and position the subwoofers to the desired location and position. Follow the instructions below to assemble a V20 ground-stacked array.

STEPS:

- 1 Place the base plate onto the topmost subwoofer.
- 2 Use the included M20 knob to secure the base plate onto the subwoofer.



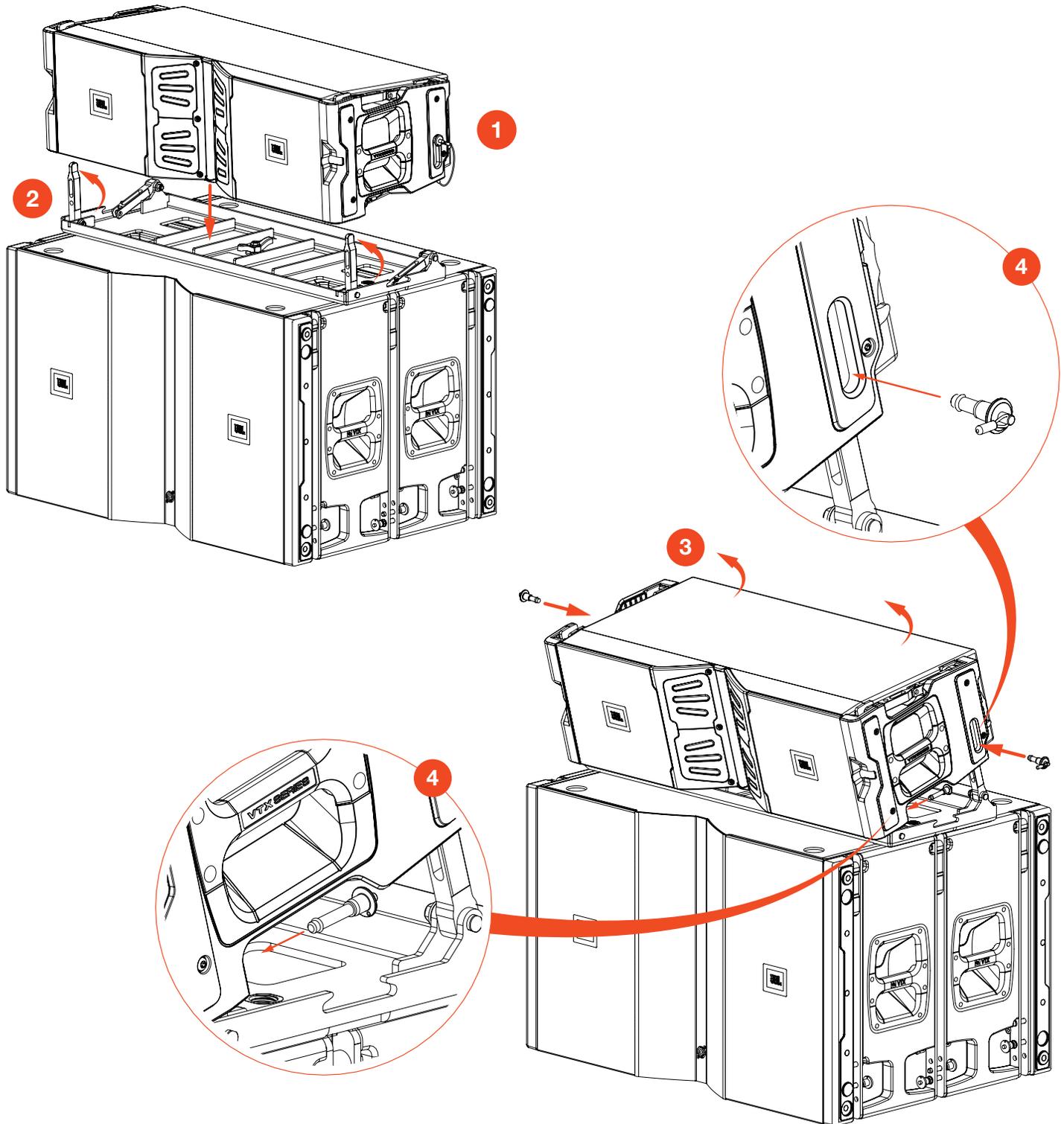
CAUTION: Safe limits for ground-stacked arrays always assume that the stacking surface (floor or stage) is flat . Do not deploy ground-stacked arrays on non-flat surfaces to avoid tipping hazards .



CAUTION: Ground-stacked arrays should always be checked in LAC-3 for mechanical safety. Always secure stacked system to the stacking platform or stacking surface to ensure stability and prevent tipping.

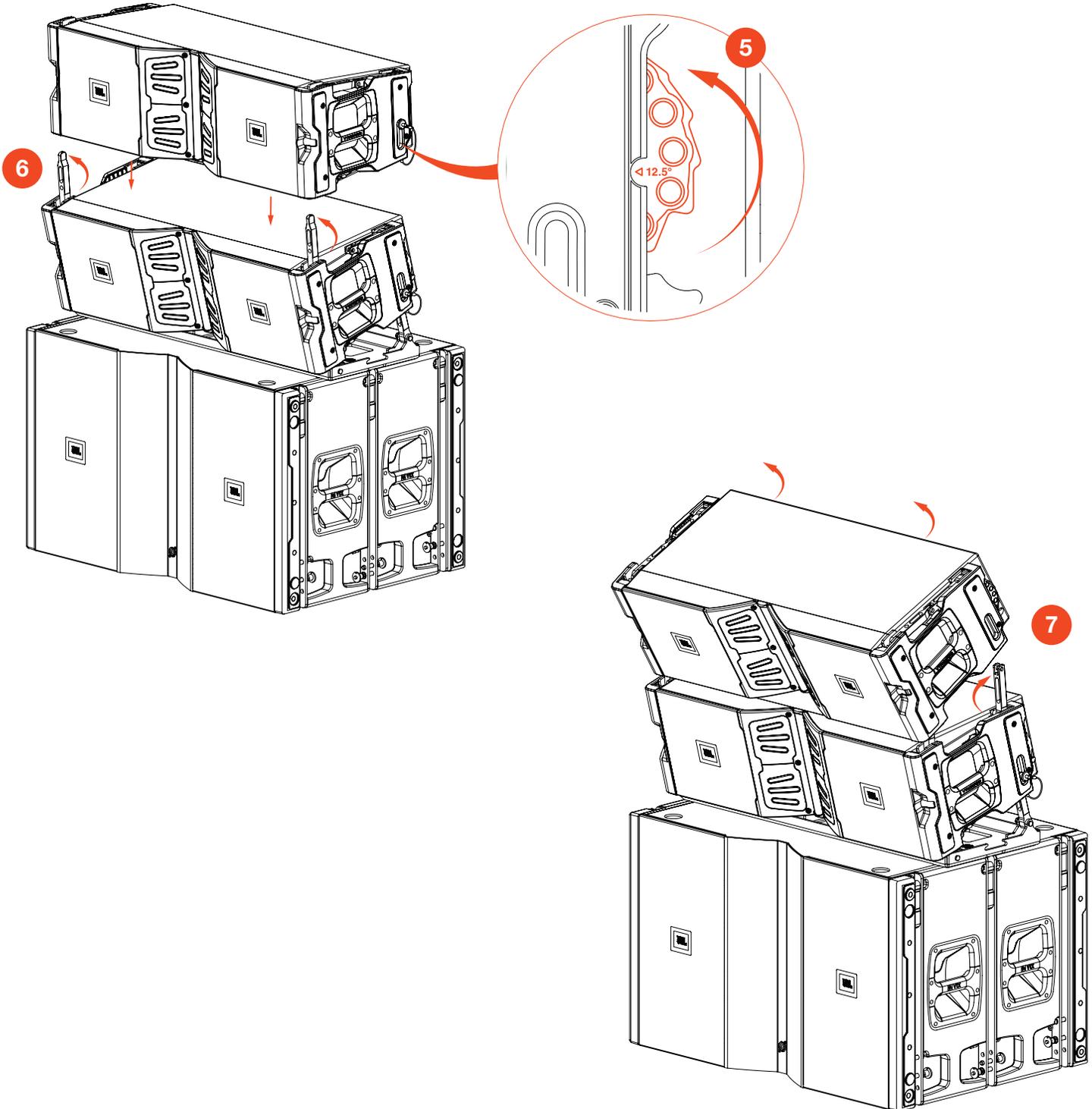
STEPS:

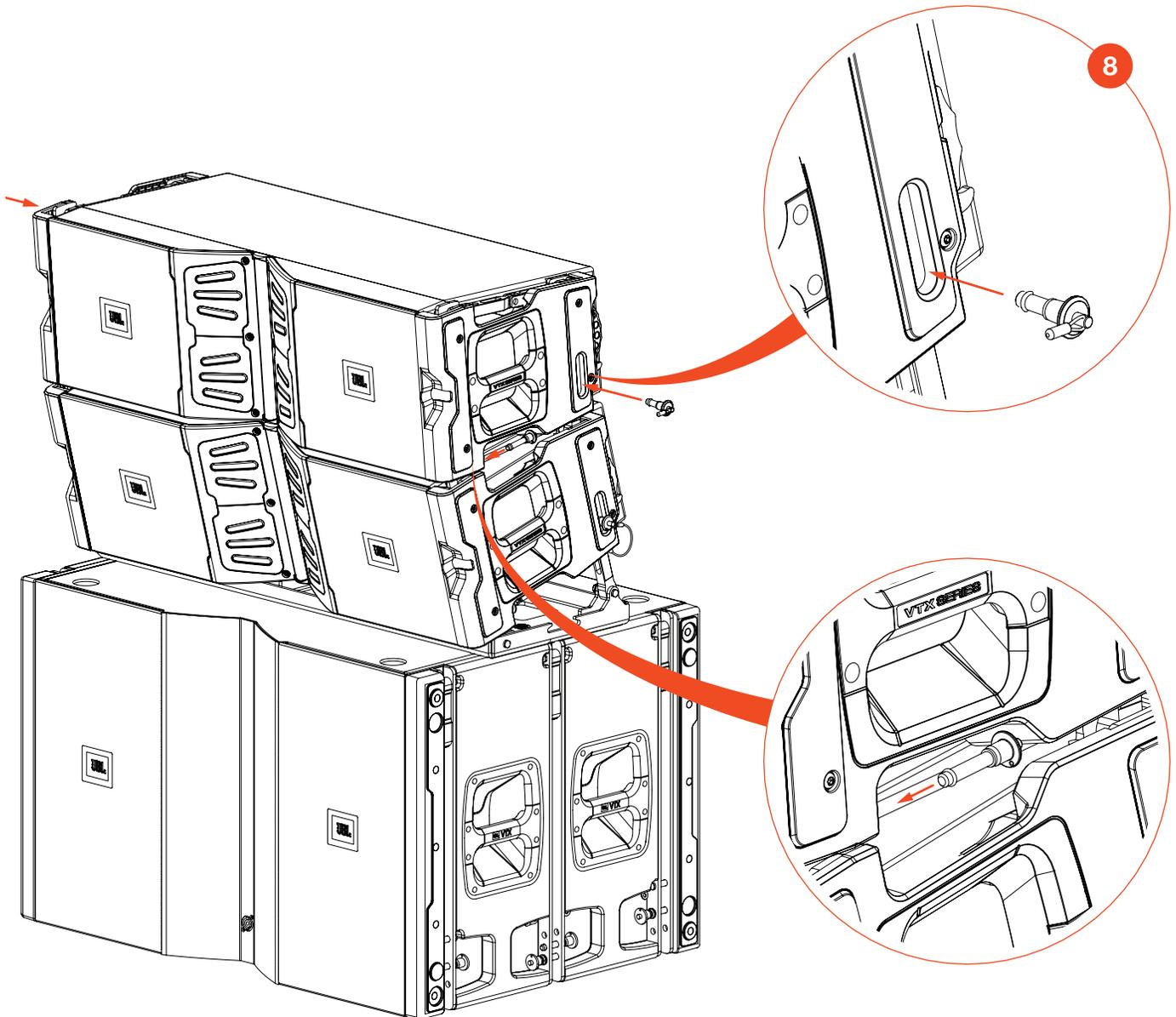
- 1 Preset the angle of the first cabinet using the Angle Selection Wheel.
- 2 Extend and align the front two hinge bars of the base plate and lower the V20 onto the base plate.
- 3 Tilt the cabinet forward, extend and align the rear hinge bars and lower the cabinet.
- 4 Pin all four corners.



STEPS:

- 5 Preset the angle of the next V20 cabinet using the Angle Selection Mechanism.
- 6 Extend and align the front hinge bars of the first V20 and stack the two cabinets together.
- 7 Tilt the V20 forward, extend the rear hinge bar, and lower the cabinet.
- 8 Pin all four corners and repeat steps 5 - 7 to connect all cabinets.



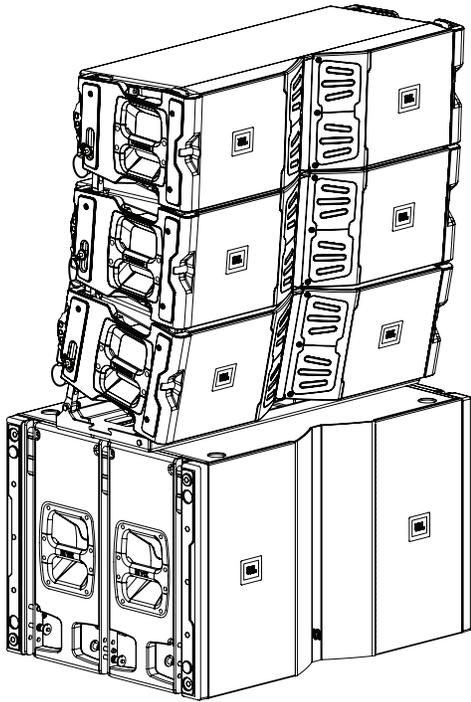


5.2 COMPRESSION VS TENSION

The V20 rigging system supports two styles of deployment: compression and tension. In compression mode, arrays are assembled to hang flat (no curvature), and a lever hoist (VTX V20 LH) is used to compress the array and create the final shape. In tension mode, cabinets are built and pinned to their final positions as the array is assembled. In this case, the secondary lever hoist is not needed since the array can maintain its shape without an external compression force.

Only tension mode is supported for ground-stacked V20 systems. Because of that, the rear quick release pin has to be slid into the side pin position, as shown in step 8 in the illustration above. This inserts the pin through the Angle Selection Wheel, securing the speakers at the selected angle positions. The rear pin position is reserved for compression mode deployments and should not be used when ground stacking.

5.3 GROUND STACK EXAMPLES

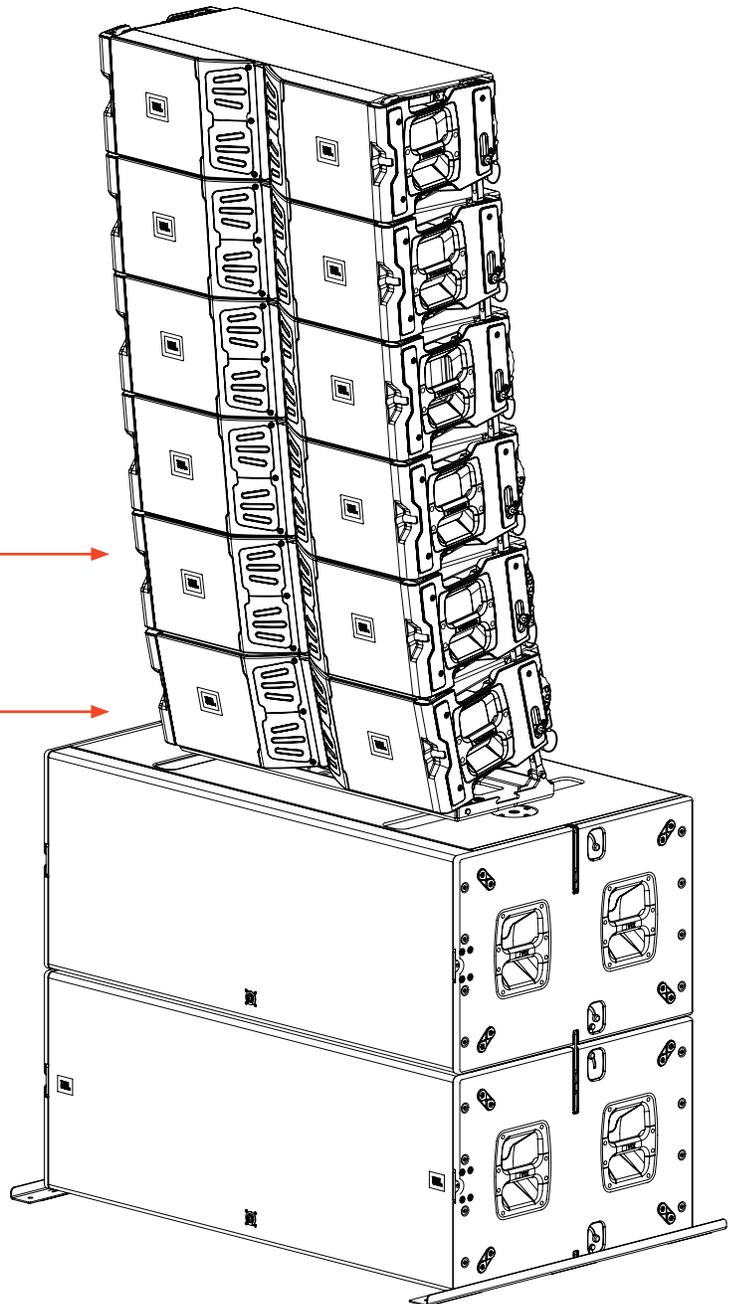


VTX V20 →

VTX V20 BP →

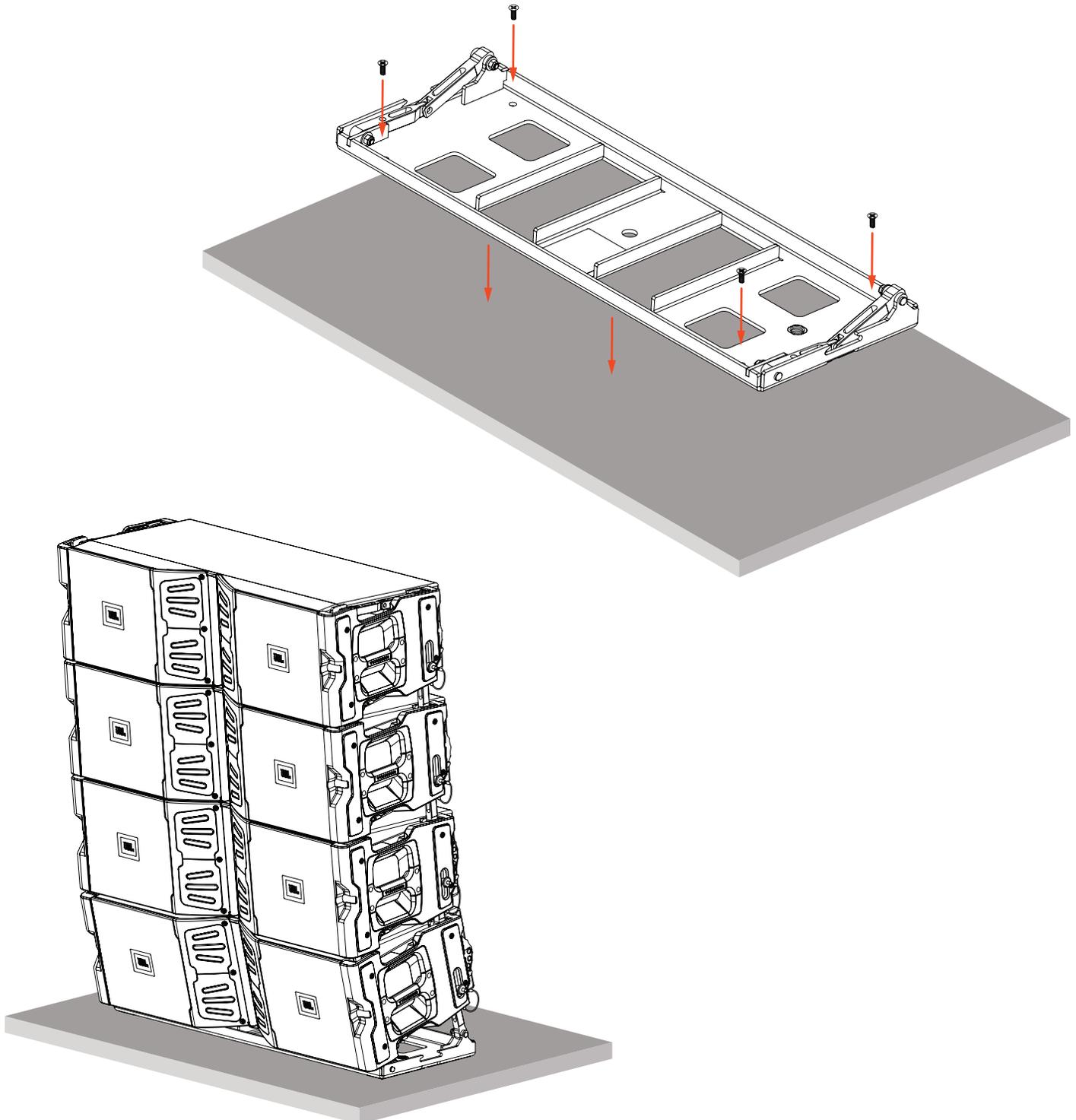
VTX B28 →

VTX B28 GND →



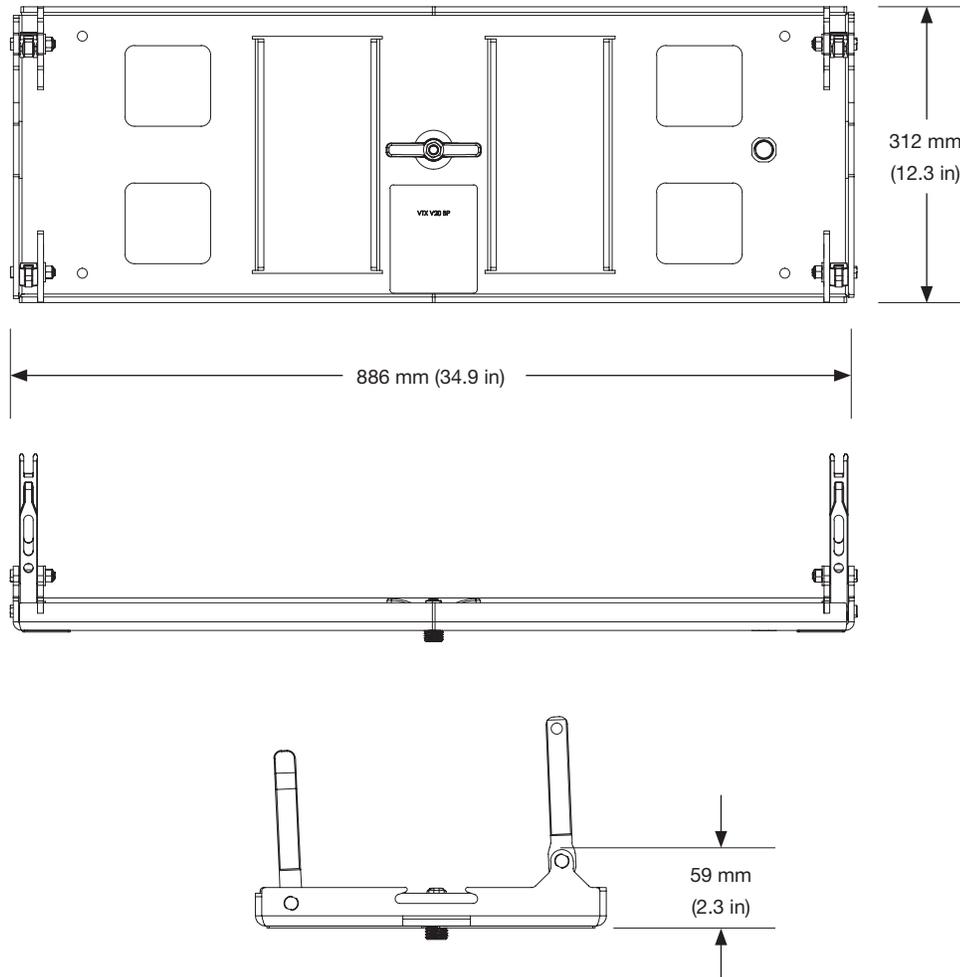
6 - ATTACHING THE BASE PLATE ONTO A STRUCTURE

The base plate can be permanently attached to a structure like a stage or platform using its four through-holes. This is especially useful for permanent installations or other fixed applications where a ground-stacked V20 system is needed, but not often moved. In such situations, the base plate is permanently attached to the structure and subwoofers are not used beneath the array. For detailed drawings of the V20 Base Plate and the position and size of its holes, refer to the VTX V20 Customer Drawings.



7 - SPECIFICATIONS

7.1 VTX V20 BP



Construction: High-grade steel with anti-corrosion coating

Finish: Black Powder Coat

Mechanical Limits¹

Maximum: 6 x VTX V20

Safe Limit: 1 x VTX V20

Dimensions (H x W x D)²: 59 mm x 886 mm x 312 mm
(2.3 in x 34.9 in x 12.3 in)

Net Weight³: 13.9 kg (30.7 lbs)

Footnotes:

1: Safe and maximum limits for ground-stacked arrays always assume that the stacking surface (floor and/or stage) is flat. Do not deploy ground-stacked arrays on non-flat surfaces. Always use JBL LAC-3 prediction software to check mechanical safety when using the VTX V20 BP Base Plate.

2: Refer to 2D and 3D Customer Drawings for more detailed dimensions.

3: Weight includes VTX V20 BP only.

JBL continually engages in research related to product improvement. Some materials, production methods and design refinements are introduced into existing products without notice as a routine expression of that philosophy. For this reason, any current JBL product may differ in some respect from its published description, but will always equal or exceed the original design specifications unless otherwise stated.

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