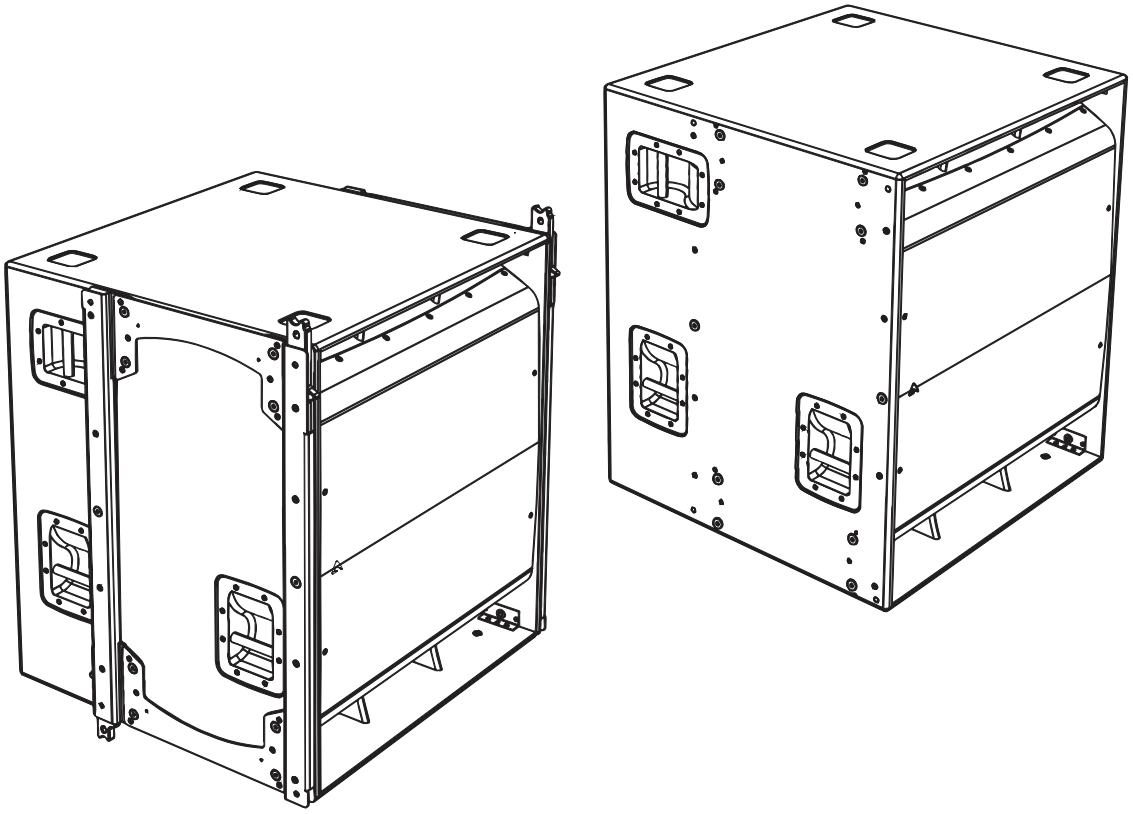
SW2421CFA - SW2421CA

Active Subwoofer



USER MANUAL

revision 2026-10-31

AXIOM

IMPORTANT SAFETY INSTRUCTIONS

Watch for these symbols:

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.

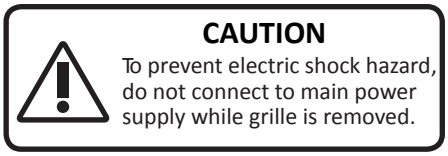
The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.



11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the 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.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, 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.
15. Warning: to reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
16. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
17. To completely disconnect this apparatus from the ac mains, disconnect the power supply cord plug from the ac receptacle.
18. The mains plug of the power supply cord shall remain readily operable.
19. This apparatus contains potentially lethal voltages. To prevent electric shock or hazard, do not remove the chassis, input module or ac input covers. No user serviceable parts inside. Refer servicing to qualified service personnel.
20. The loudspeakers covered by this manual are not intended for high moisture outdoor environments. Moisture can damage the speaker cone and surround and cause corrosion of electrical contacts and metal parts. Avoid exposing the speakers to direct moisture.
21. Keep loudspeakers out of extended or intense direct sunlight. The driver suspension will prematurely dry out and finished surfaces may be degraded by long-term exposure to intense ultra-violet (UV) light.
22. The loudspeakers can generate considerable energy. When placed on a slippery surface such as polished wood or linoleum, the speaker may move due to its acoustical energy output.
23. Precautions should be taken to assure that the speaker does not fall off a stage or table on which it is placed.
24. The loudspeakers are 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.







This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

DECLARATION OF CONFORMITY

The product is in compliance with:
EMC Directive 2014/30/EU, LVD Directive 2014/35/EU, RoHS Directive 2011/65/EU and 2015/863/ EU, WEEE Directive 2012/19/EU.

EN 55032 (CISPR 32) STATEMENT

Warning: This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference. Under the EM disturbance, the ratio of signal-noise will be changed above 10 dB.

The product is in compliance with:
S.I. 2016/1091 Electromagnetic Compatibility Regulations 2016, S.I. 2016/1101 Electrical Equipment (Safety) Regulations 2016, S.I. 2012/3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012.

LIMITED WARRANTY

Proel warrants all materials, workmanship and proper operation of this product for a period of two years from the original date of purchase. If any defects are found in the materials or workmanship or if the product fails to function properly during the applicable warranty period, the owner should inform about these defects the dealer or the distributor, providing receipt or invoice of date of purchase and defect detailed description. This warranty does not extend to damage resulting from improper installation, misuse, neglect or abuse. Proel S.p.A. will verify damage on returned units, and when the unit has been properly used and warranty is still valid, then the unit will be replaced or repaired. Proel S.p.A. is not responsible for any “direct damage” or “indirect damage” caused by product defectiveness.

- This unit package has been submitted to ISTA 1A integrity tests. We suggest you control the unit conditions immediately after unpacking it.
- If any damage is found, immediately advise the dealer. Keep all unit packaging parts to allow inspection.
- Proel is not responsible for any damage that occurs during shipment.
- Products are sold “delivered ex warehouse” and shipment is at charge and risk of the buyer.
- Possible damages to unit should be immediately notified to forwarder. Each complaint for package tampered with should be done within eight days from product receipt.

CONDITIONS OF USE

Proel do not accept any liability for damage caused to third parties due to improper installation, use of non-original spare parts, lack of maintenance, tampering or improper use of this product, including disregard of acceptable and applicable safety standards. Proel strongly recommends that this loudspeaker cabinet be suspended taking into consideration all current National, Federal, State and Local regulations. The product must be installed be qualified personal. Please contact the manufacturer for further information.

INDEX

INTRODUCTION	4	KPTAX2022 FLYING BAR AND ACCESSORIES	9
TECHNICAL SPECIFICATIONS	4	KPTAX2022 FLYING BAR REVERSAL	10
MECHANICAL DRAWING (SW2421CA)	5	KPTAX2022 FLYING BAR ASSEMBLY	11
OPTIONAL ACCESSORIES (SW2421CA)	5	SW2421CFA SKATE REMOVAL	13
SPARE PARTS (SW24215CA)	5	KPTAX2022 - SW2421CFA ARRAY ASSEMBLY	14
MECHANICAL DRAWING (SW2421CFA)	6	KPTAX2022 - SW2421CF - AX2022 ASSEMBLY	16
OPTIONAL ACCESSORIES (SW2421CFA)	6	SW2421CF - AX2022 STACKED DEPLOYMENT	19
SPARE PARTS (SW24215CFA)	6	FLOOR DEPLOYMENT POSITIONING	22
ELECTRONIC AND CONNECTIVITY FEATURES	7	PROCESSING PRESETS	23
PREDICTION SOFTWARE: EASE FOCUS 3	8	SYSTEM DESIGN, CONTROL AND MONITORING	24
AIMING AND SUSPENDING INSTRUCTIONS	9		

INTRODUCTION

The SW2421CA and SW2421CFA are compact, high power-density subwoofer models designed for applications requiring maximum SPL, extended low-frequency response, and controlled directivity, making it suitable for demanding live sound environments. Its internal pressure-gradient design enables cardioid, hypercardioid, and end-fire operation from a single cabinet, eliminating the need for complex array setups or cabinet reconfiguration.

The system combines a front-loaded 24-inch high-excursion driver and a rear-mounted 21-inch driver. The 24-inch transducer provides primary low-frequency output, while the 21-inch unit acts as an active rear element. Precise DSP control

Constructed from reinforced 18 mm phenolic birch plywood, the enclosure can develop very high SPL with low distortion while maintaining fast transient response and clarity. The system operates from 31 Hz to 90 Hz, delivering extended bass response with controlled dispersion. Cardioid mode minimizes rear energy, while end-fire mode maximizes forward output.

Its two integrated 4000 W Class-D amplifier modules with SMPS and PFC provide 8000 W total system power. Independent fifth-generation SHARC+ floating-point DSP channels operating at 32-bit resolution with 24-bit converters deliver 121 dB dynamic range per channel and precise control of the pressure-gradient behavior. The module features network connectivity based gigabit Ethernet ports supporting AES67 and AVB-Milan audio transport at 96/48 kHz, together with AES70 standardized control and device management. The AXIOM AUDIA software platform enables unified remote control, monitoring and configuration alongside other AXIOM active loudspeakers and Q-NEX+ amplified systems within the same workspace.

SW2421CA is designed for ground deployments, while the SW2421CFA is the flyable version with integrated rigging hardware that is mechanically compatible with AX2022A/P line array enclosures.

TECHNICAL SPECIFICATIONS

SYSTEM

System Acoustic Principle	Native Active Cardioid Subwoofer
Frequency Response (-3 dB)	31 Hz – 90 Hz (Processed)
Horizontal Coverage (-6 dB)	Cardioid - Endfire (preset dependent)
Vertical Coverage (-6 dB)	Cardioid - Endfire (preset dependent)
Maximum Peak SPL	146 dB SPL (AES 75 Standard) @1 m

TRANSDUCERS

Front	24"(610 mm) Diaphragm - 6" (152 mm) Voice coil, Neodymium Subwoofer, 4 Ω
Rear	21"(260 mm) Diaphragm - 4,5" (115 mm) Tetracoil, Neodymium Subwoofer, 4 Ω

DIMENSIONS

Height	1006 mm (39.61")
Depth	800 mm (31.5")
Width (SW2421CA)	830 mm (32.67")
Width (SW2421CFA)	880.2 mm (34.65")
Weight (SW2421CA)	139 kg (309.44 lbs)
Weight (SW2421CFA)	165 kg (363.7 lbs)

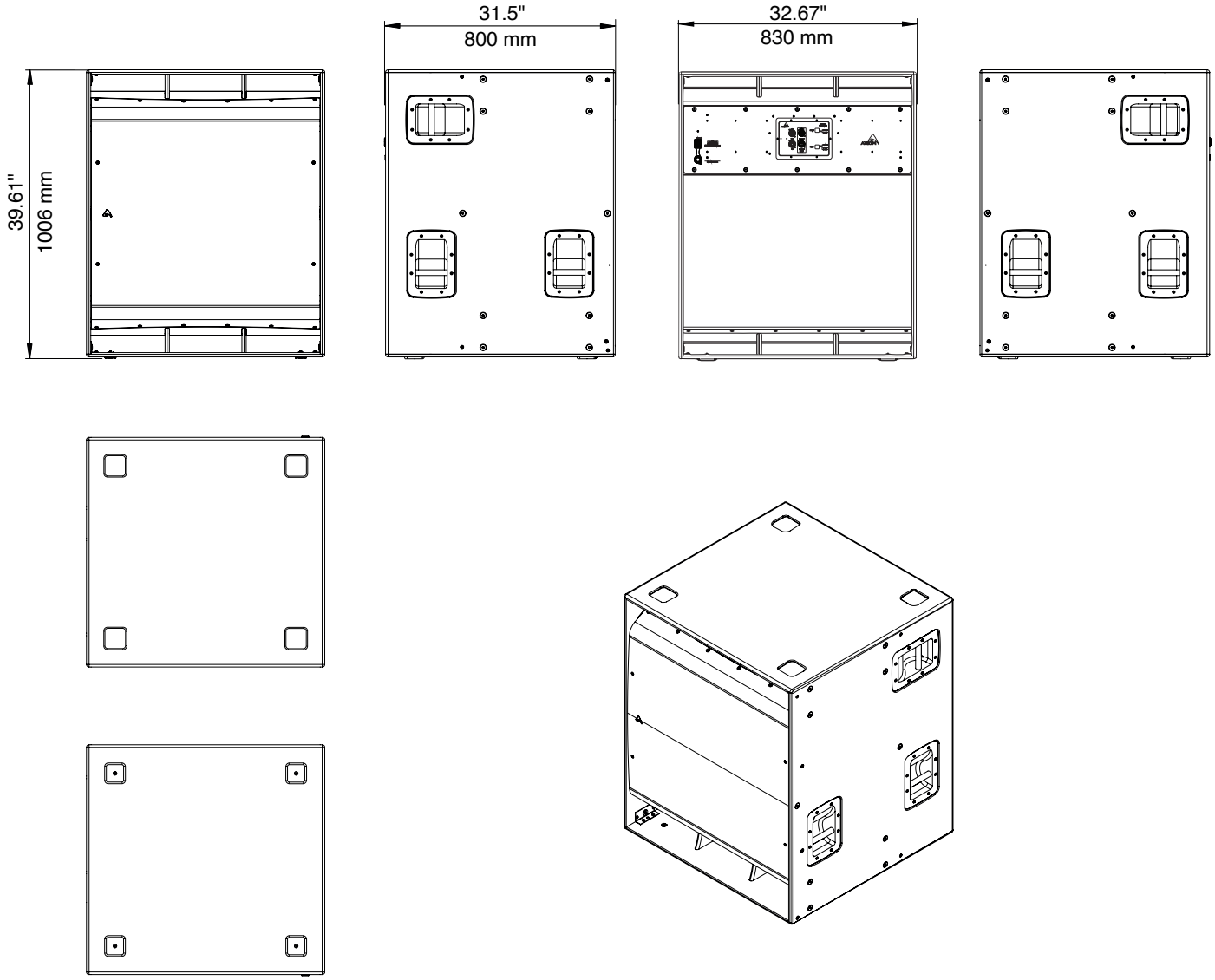
ELECTRICAL

Input Impedance	30 kΩ balanced, 15 kΩ unbalanced
Input Sensitivity	+4 dBu / 1.25 V
Audio Networking	AVB - Milan; AES67
Signal Processing	Fifth-generation SHARC+ 32-bit floating-point DSP
Direct access Controls	3 Presets (End Fire / Hyper / Cardioid)
Remote Control	AUDIA software with AES70 device control standard
Amplifier Type	Class D with SMPS and PFC
Output Power	4000 W + 4000 W
Mains Voltage Range (VAC)	100 - 240 V~ ±10% 50/60 Hz
IN / OUT Connectors	Neutrik XLR-M / XLR-F
IN / OUT Network Connectors	ETHERCON® (NE8FAV)
Mains Connector	PowerCon TRUE1 (NAC3PX In/Out)
Cooling	Variable speed DC fan

ENCLOSURE & CONSTRUCTION

Enclosure material	18 mm, reinforced Phenolic Birch
Paint	High resistance, water based

MECHANICAL DRAWING (SW2421CA)



OPTIONAL ACCESSORIES (SW2421CA)

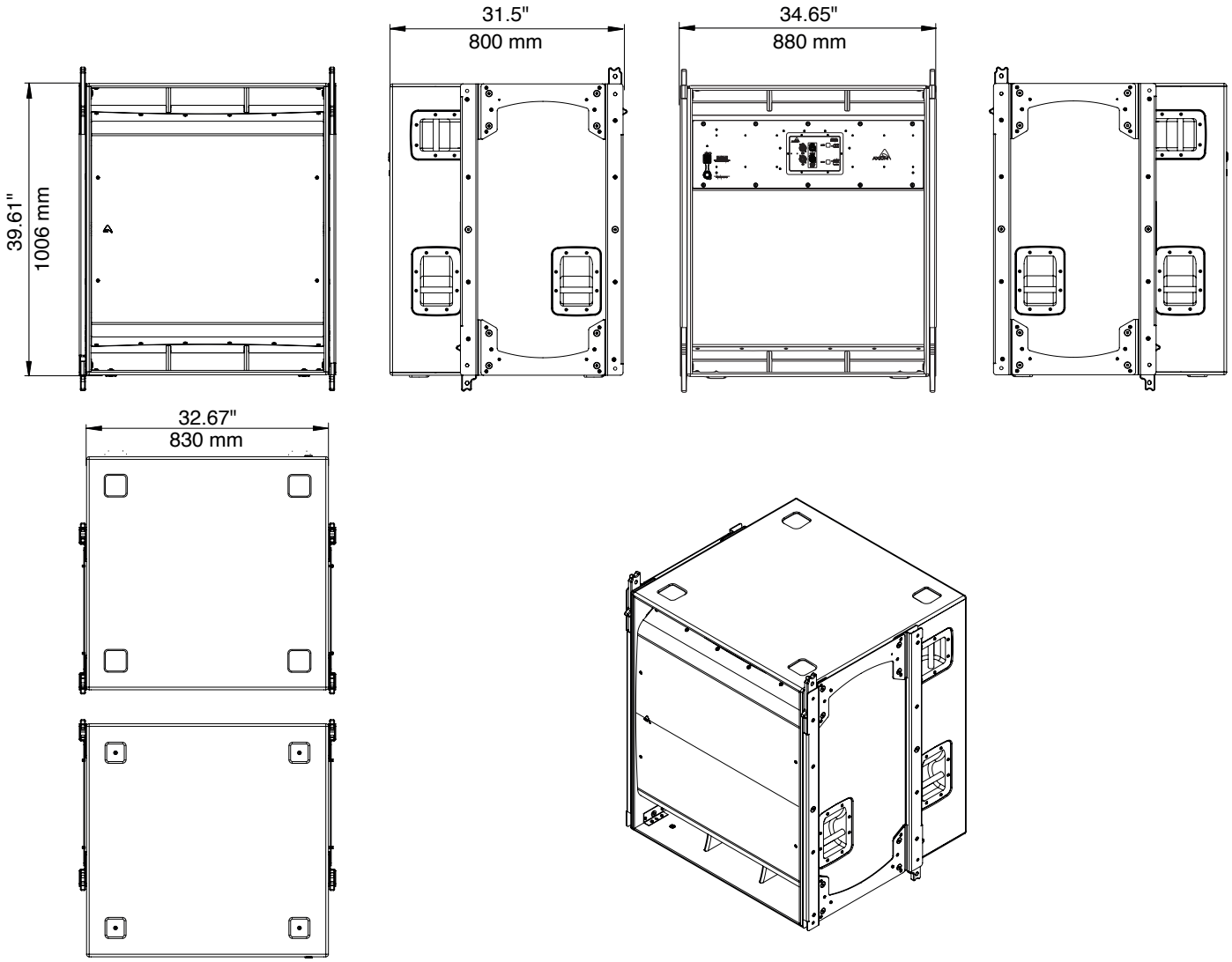
AXSKATESW2421	Bottom skate SW2421C
COVERSW2421	Protective cover
KPTAX2022	Flying bar AX2022 / SW2421CF
SW2421FKIT	SW2421C flying kit

*see **http://www.axiomproaudio.com/** for detailed descriptions and other available accessories.*

SPARE PARTS (SW24215CA)

98AXM2460W4	24" woofer - 6" voice coil - 4 ohm
98AXM2150W4	21" woofer - 4" Tetracoil® dual voice coil - 4 ohm
93PLS300027	Rubber feet (SW2421CP only)
91DALITEMOD4HV	Power amplifier module
91DSPKT16	DSP Board
NAC3MPXTRUE1	Mains connector with sealing cap

MECHANICAL DRAWING (SW2421CFA)



OPTIONAL ACCESSORIES (SW2421CFA)

AXSKATESW2421	Bottom skate SW2421C
COVERSW2421	Protective cover
KPTAX2022	Flying bar AX2022 / SW2421CF

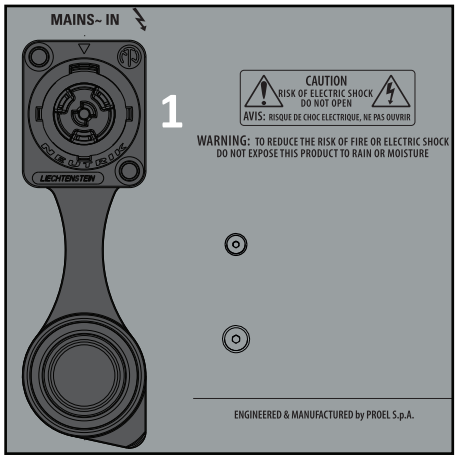
*see **http://www.axiomproaudio.com/** for detailed descriptions and other available accessories.*

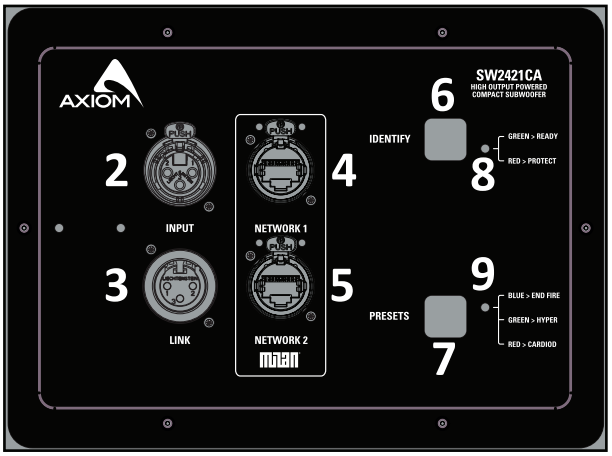
SPARE PARTS (SW24215CFA)

98AXM2460W4	24" woofer - 6" voice coil - 4 ohm
98AXM2150W4	21" woofer - 4" Tetracoil® dual voice coil - 4 ohm
95MET300251	Locking Pin
91DALITEMOD4HV	Power amplifier module
91DSPKT16	DSP Board
NAC3MPXTRUE1	Mains connector with sealing cap

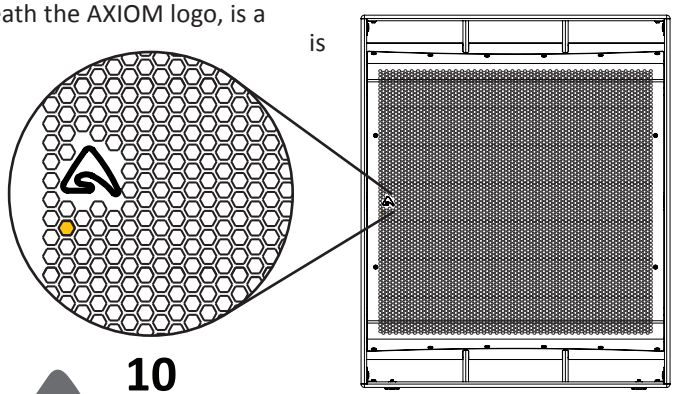
ELECTRONIC AND CONNECTIVITY FEATURES

The rear panel of the SW2421CA and SW2421CFA features mains power, analog audio signal and network connections, as well as two capacitive contact buttons and associated LED indicators.





1. **MAINS~IN**: PowerCon TRUE1 connector per AC Mains power 100 - 240 VAC ±10% 50/60 Hz. The connector is equipped with a folding seal to prevent the entry of foreign solids or liquids while the power is disconnected. There is no output link, as each SW2421CA/CFA unit should be powered on an independent circuit.
2. **INPUT**: This female XLR connector serves as the input for an analog audio signal. Pin 1 Shield; Pin 2 +; Pin 3 - ; 30 kΩ balanced. Sensitivity: +4 dBu / 1.25 V. The analog input can be used as the primary or backup audio signal input.
3. **LINK**: This male XLR connector is a parallel output of the INPUT signal for connecting further units.
4. **NETWORK 1**: The two EtherCon RJ45 connectors provide 1000BASE-T Ethernet connectivity for both the control network data from the AUDIA software via AES70 and, simultaneously, 48/96 kHz digital audio via the Milan protocol. The two network connectors are configured as a switched connection to link further enclosures. Refer to the AUDIA software manual.
5. **NETWORK 2**: See NETWORK 1.
6. **IDENTIFY**: When the enclosure is connected via network to a PC running the AUDIA software, this capacitive contact button can be used to identify its virtual counterpart within the software. Simply touching this contact will highlight this unit within a system project. Refer to the AUDIA software manual.
7. **PRESETS**: When the enclosure is not connected via network to a PC running the AUDIA software, this capacitive contact button will toggle between the three DSP presets – Cardioid, Hypercardioid and End Fire (see "PROCESSING PRESETS" on page 23). **When, instead, the enclosure is under network control, this button is disabled**.
   a. Touch and hold to enter the preset selection mode.
   b. Each successive short touch cycles through the three available presets, indicated by the color of the associated LED (**9**).
   c. When the desired preset is selected, touch and hold to confirm. The associated LED (**9**) will remain lit to indicate the selected preset.
   d. If the button remains untouched for 30 seconds during this process, the selection mode is cancelled and the processing preset will return to its previous state.
8. **LED indicator**: This multicolor LED serves as a rapid visual verification of the state of the amplification module. It will light green when the amplifier is operating under normal conditions. It will light red to signal any fault protection state. When the enclosure is under control of a connected AUDIA session via the network, this LED will light intermittently to provide rapid visual verification of active network control.
9. **LED indicator**: This multicolor LED indicates the current processing preset selected. Red indicates the Cardioid preset, Green indicates the Hypercardioid preset, and Blue indicates the End Fire preset. See **PRESETS** (**7**) above.
10. **LED indicator**: On the front grille of the enclosure, underneath the AXIOM logo, is a high intensity amber LED. When the "IDENTIFY" function is activated for the unit within the AUDIA software environment, this LED will light to provide rapid visual identification of the unit from a distance. Refer to the AUDIA software manual.

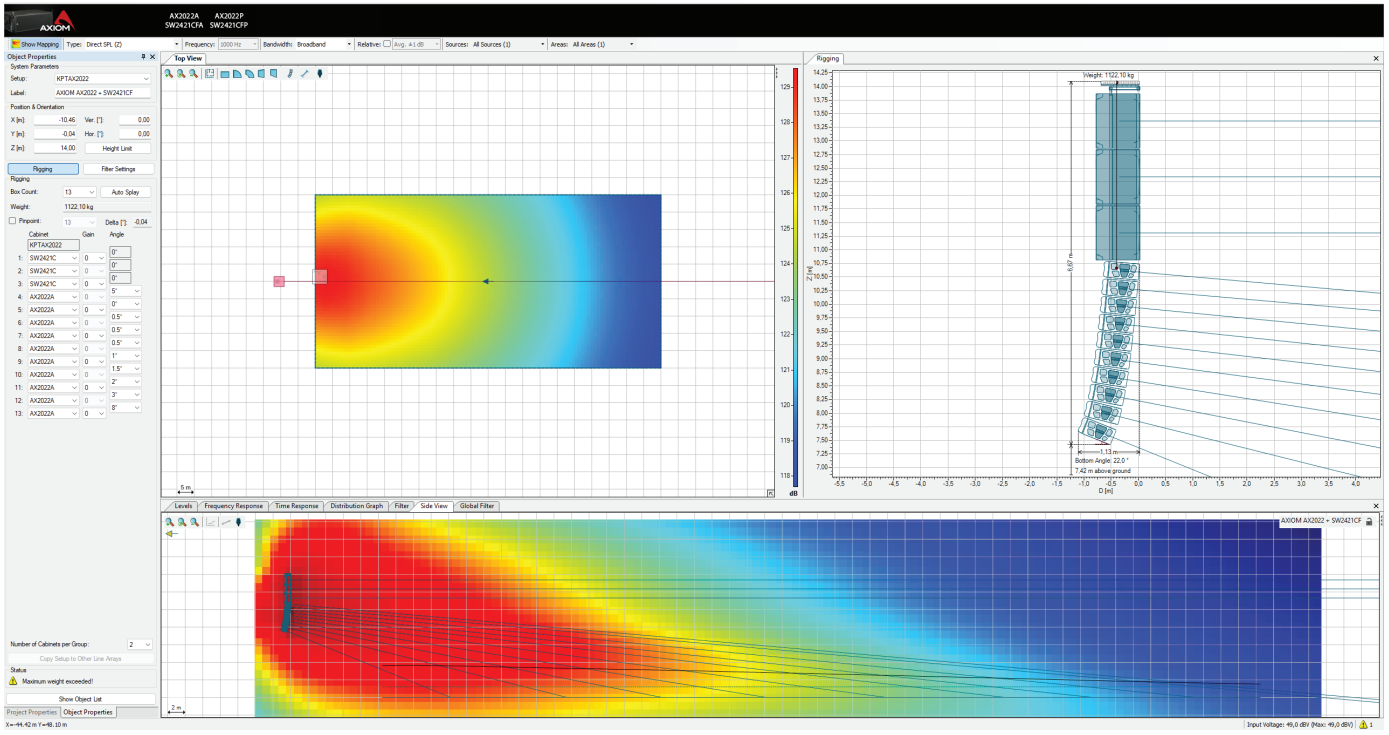


PREDICTION SOFTWARE: EASE FOCUS 3

For proper aiming of a complete system, we always recommend the use of the Aiming Software - EASE Focus 3:
The EASE Focus 3 Aiming Software is a 3D Acoustic Modelling Software that serves for the configuration and modelling of Line Arrays and conventional speakers close to reality. It only considers the direct field, created by the complex addition of the sound contributions of the individual loudspeakers or array components.
The design of EASE Focus is targeted at the end user. It allows the easy and quick prediction of the array performance in a given venue. The scientific base of EASE Focus stems from EASE, the professional electro- and room acoustic simulation software developed by AFMG Technologies GmbH. It is based on the EASE GLL loudspeaker data file required for its use. The GLL file contains the data that defines the Line Array with regard to its possible configurations as well as to its geometrical and acoustical properties.

Download the EASE Focus 3 application, as well as the .GLL loudspeaker data file specific to the product from the AXIOM website at https://www.axiomproaudio.com/, clicking on 'Downloads' section of the product page.

Use the menu option **Edit / Import System Definition File** to import the **GLL** file. The detailed instructions to use the program are located in the menu option **Help / User's Guide**.
Note: Some windows systems will require the .NET Framework 4 that can be download from website at https://focus.afmg.eu/.



WARNING! CAREFULLY READ THE FOLLOWING INSTRUCTIONS AND CONDITION OF USE:
- **This loudspeaker is designed exclusively for Professional audio applications. The product must be installed by qualified personal only.**
- **Proel strongly recommends that this loudspeaker cabinet be suspended taking into consideration all current National, Federal, State and Local regulations. Please contact the manufacturer for further information.**
- **Proel will accept no liability for damage caused to third parties due to improper installation, lack of maintenance, tampering or improper use of this product, including disregard of acceptable and applicable safety standards.**
- **During installation, priority attention should be given to the possible risk of falling or toppling speaker enclosures and the dangers thus posed to persons and equipment. Wear suitable protective gear. Observe all instructions provided with the rigging components and the loudspeaker cabinets. When chain hoists are in operation, ensure that there is nobody directly underneath or in the vicinity of the load. Do not under any circumstances climb on the array.**

AIMING AND SUSPENDING INSTRUCTIONS (SW2421CFA only)

Flying sub-woofers presents various advantages and some disadvantages. One disadvantage is that as the sub-woofers don't couple with the ground and, in indoor usage, can present different behaviours depending on the ceiling and walls. The advantages are that the space underneath the stage can be free from subs, the coupling between subs and satellites is superior and, using a column of sub boxes, the basses can be steered more deeply into the audience with a more uniform distribution of the low frequencies.

SW2421CFA subwoofers can be suspended in homogeneous arrays or at the top of vertical arrays of AX2022P/A loudspeakers using the KPTAX2022 flying bar. The enclosures are linked together into a column using a series of couplers integrated in the frame of each enclosure. Each system can be configured properly both acoustically and mechanically using the aiming software. Coupling SW2421CFA units to the flying bar or one another does not require any adjustment: the two forward coupling bars of the lower units align with and enter the lugs of the upper unit, while rear coupling bars of the upper unit align with and enter the lugs of the lower unit and each bar is coupled to each lug using a 10 mm ball-lock pin.

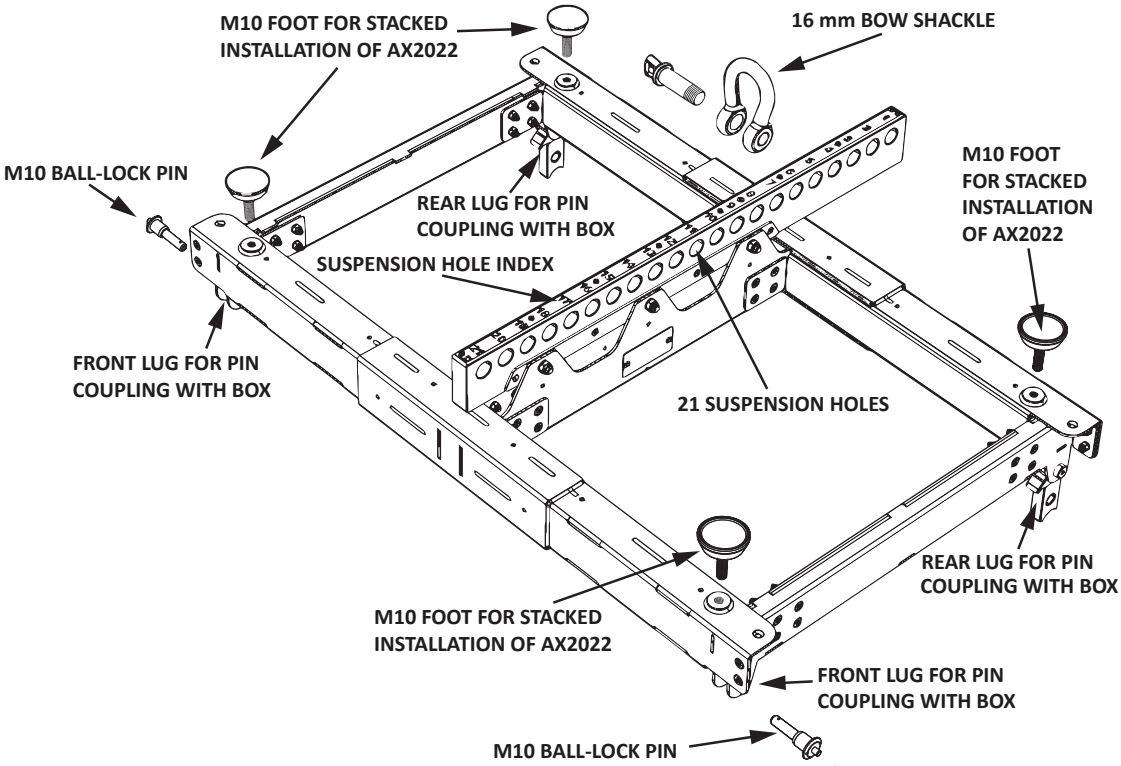
Single Point rigging:

KPTAX2022 flying bar has a maximum capacity of 1650 kg (3640 lbs) with a 0° head angle. It can support up to:

- **16 AX2022P/A with flying bar inclined from +20° to -7°**
- **12 AX2022P/A with flying bar inclined from +20° to -10°**
- **3 SW2421CFP/A + 10 AX2022P/A with flying bar at 0° – use only suspension holes from #9 to #13**
- **10 SW2421CFP/A with flying bar at 0° – use only suspension hole #11**

Note: The use of multiple rigging points requires specific study for different configurations. Contact the manufacturer.

KPTAX2022 FLYING BAR AND ACCESSORIES



Wind loads

When planning an open-air event it is essential to obtain current weather and wind information. When loudspeaker arrays are flown in an open-air environment, possible wind effects must be taken into account. Wind load produces additional dynamic forces acting on the rigging components and the suspension, which may lead to a dangerous situation. If according to the forecast wind forces higher than 5 bft (29-38 km/h) are possible, the following actions have to be taken:

- The actual on-site wind speed has to be monitored permanently. Be aware that wind speed typically increases with height above ground.
- Suspension and securing points of the array should be designed to support double the static load in order to withstand any additional dynamic forces.

WARNING!

Flying loudspeakers overhead at wind forces higher than 6 bft (39-49 km/h) is not recommended.

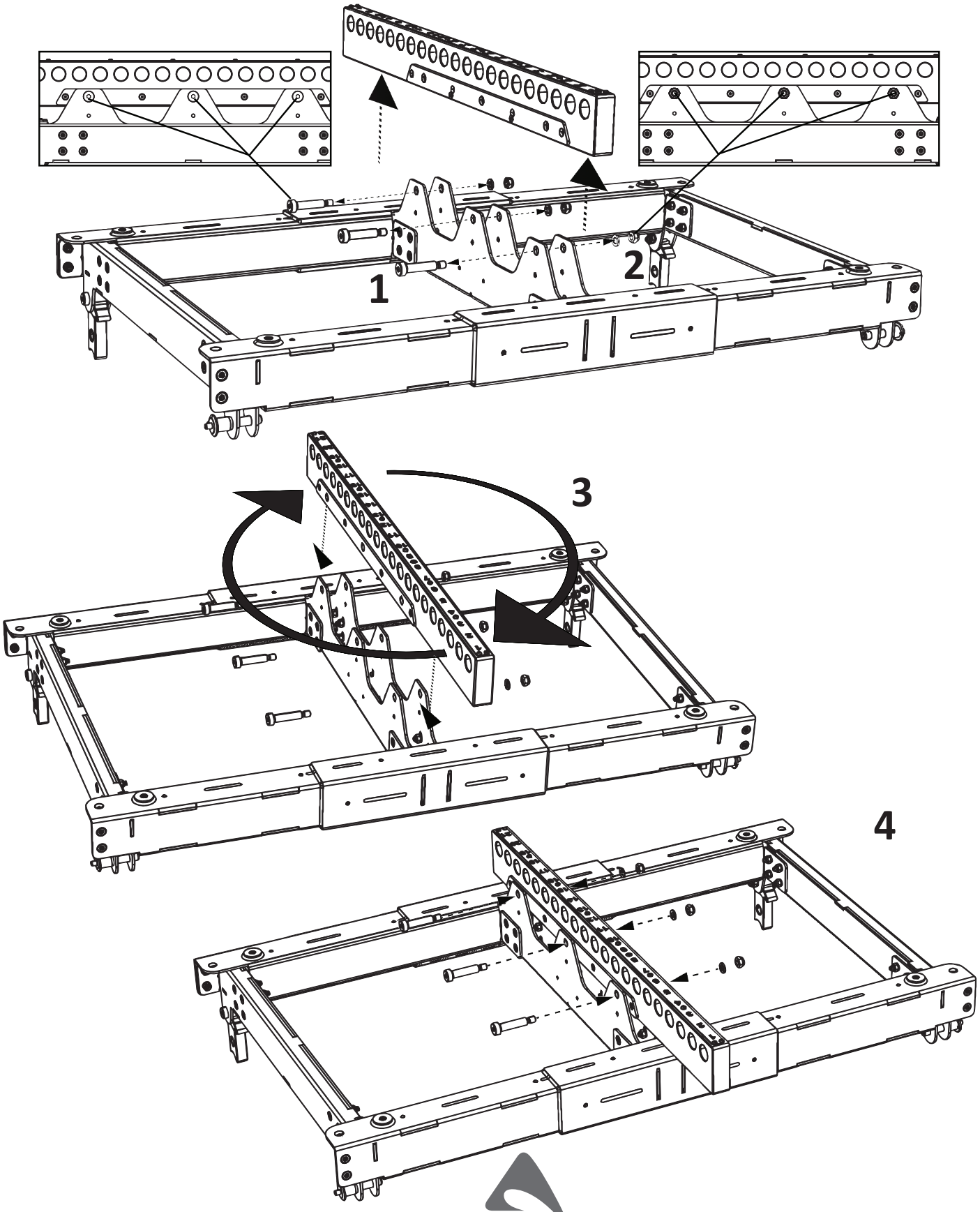
If the wind force exceeds 7 bft (50-61 km/h) there is a risk of mechanical damage to the components which may lead to a dangerous situation for persons in the vicinity of the flown array.

- Stop the event and make sure that no person remains in the vicinity of the array.

- Lower and secure the array.

KPTAX2022 FLYING BAR REVERSAL

The KPTAX2022 flying bar can be reversed to provide greater flexibility in terms of aiming arrays of AX2022 or combined arrays of SW2421CFA/P and AX2022P/A. If the installation configuration requires the reversed flying bar, this can be carried out by using a 5 mm hex wrench and a 13 mm spanner to remove the three sets of M8 bolts and hardware **(1&2)**. The bar assembly then be lifted out and rotated 180° **(3)**. Once the bar is re-inserted, the hardware must be replaced and thoroughly torqued **(4)**.

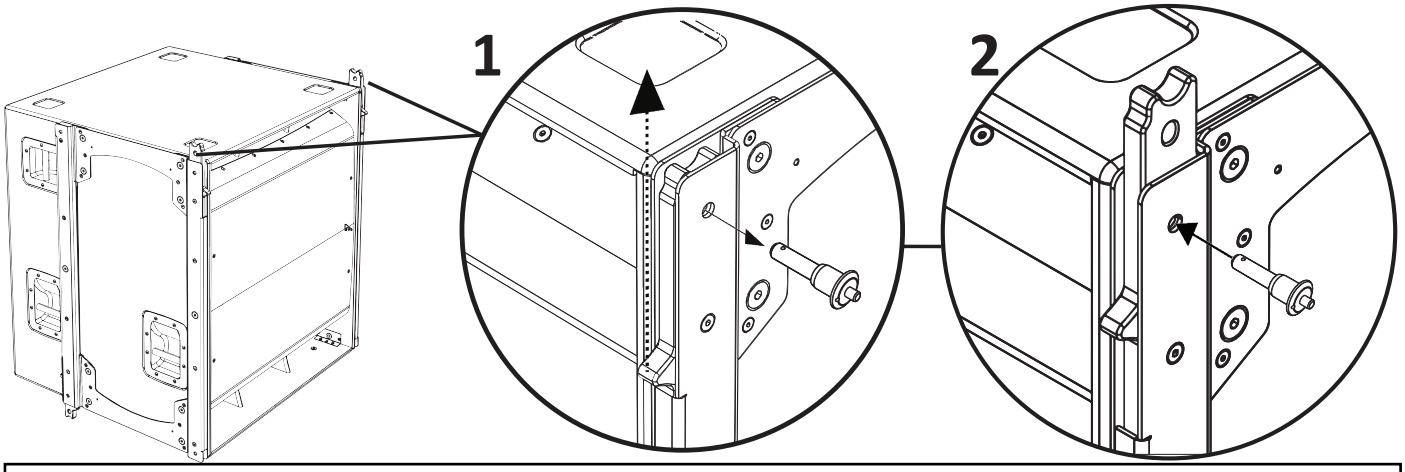


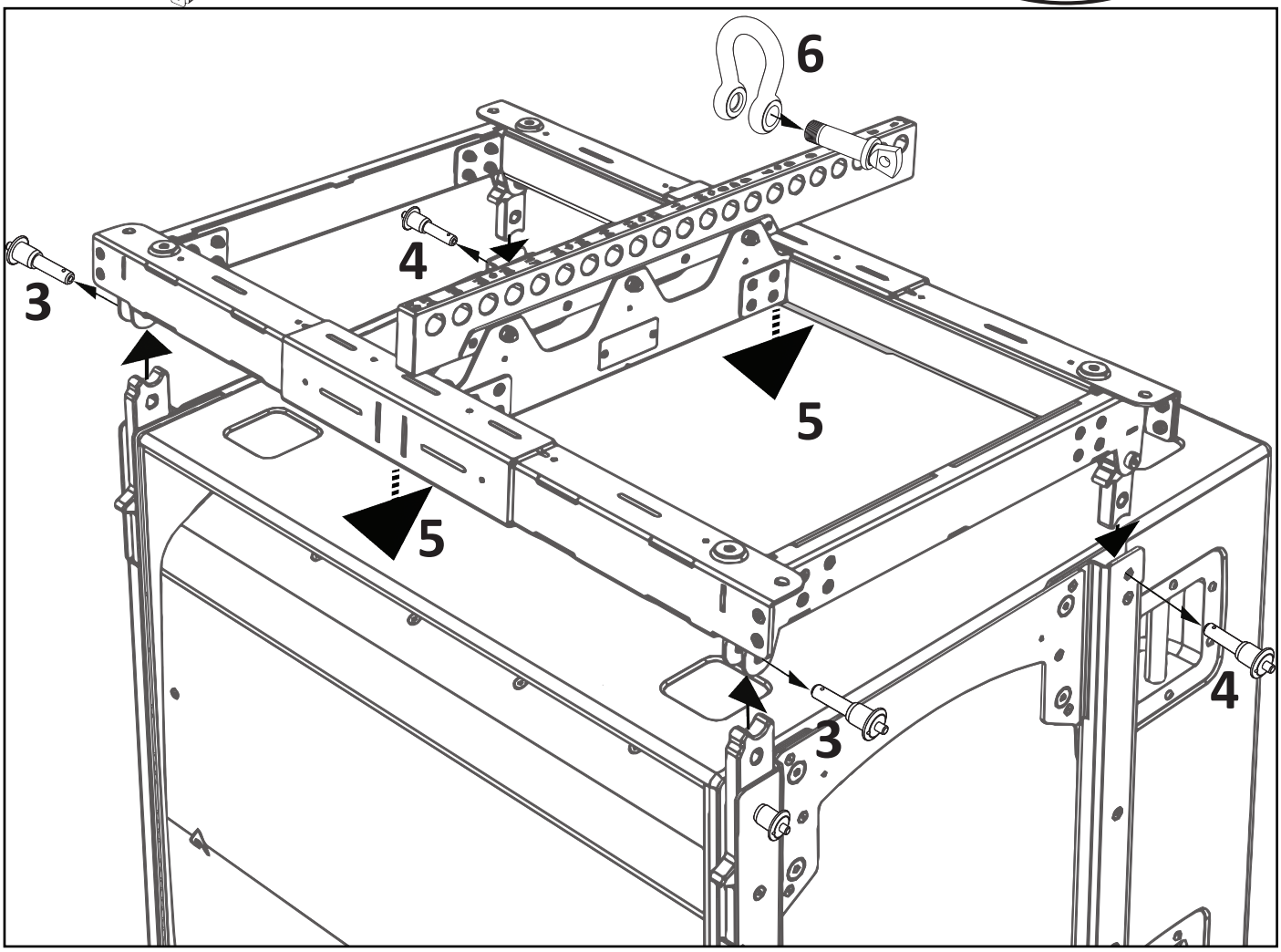
KPTAX2022 FLYING BAR ASSEMBLY SEQUENCE

Follow the sequence in the following figures for coupling the flying bar to the first enclosure. Ensure that all locking pins are inserted properly and locked.

Begin by deploying the forward extendable coupling lugs atop the SW2421CFA and locking them in place using the supplied locking pins **(1&2)**. Next, remove the locking pins from the forward lugs of the KPTAX2022 Flying Bar **(3)** and the locking pins from the rear lugs on the top of the SW2421CFA **(4)**. Lower the KPTAX2022 onto the subwoofer, aligning it so that the forward and rear lugs mate with those of the SW2421CFA **(5)**.

Finally, unscrew and remove the pin from the shackle **(6)**.

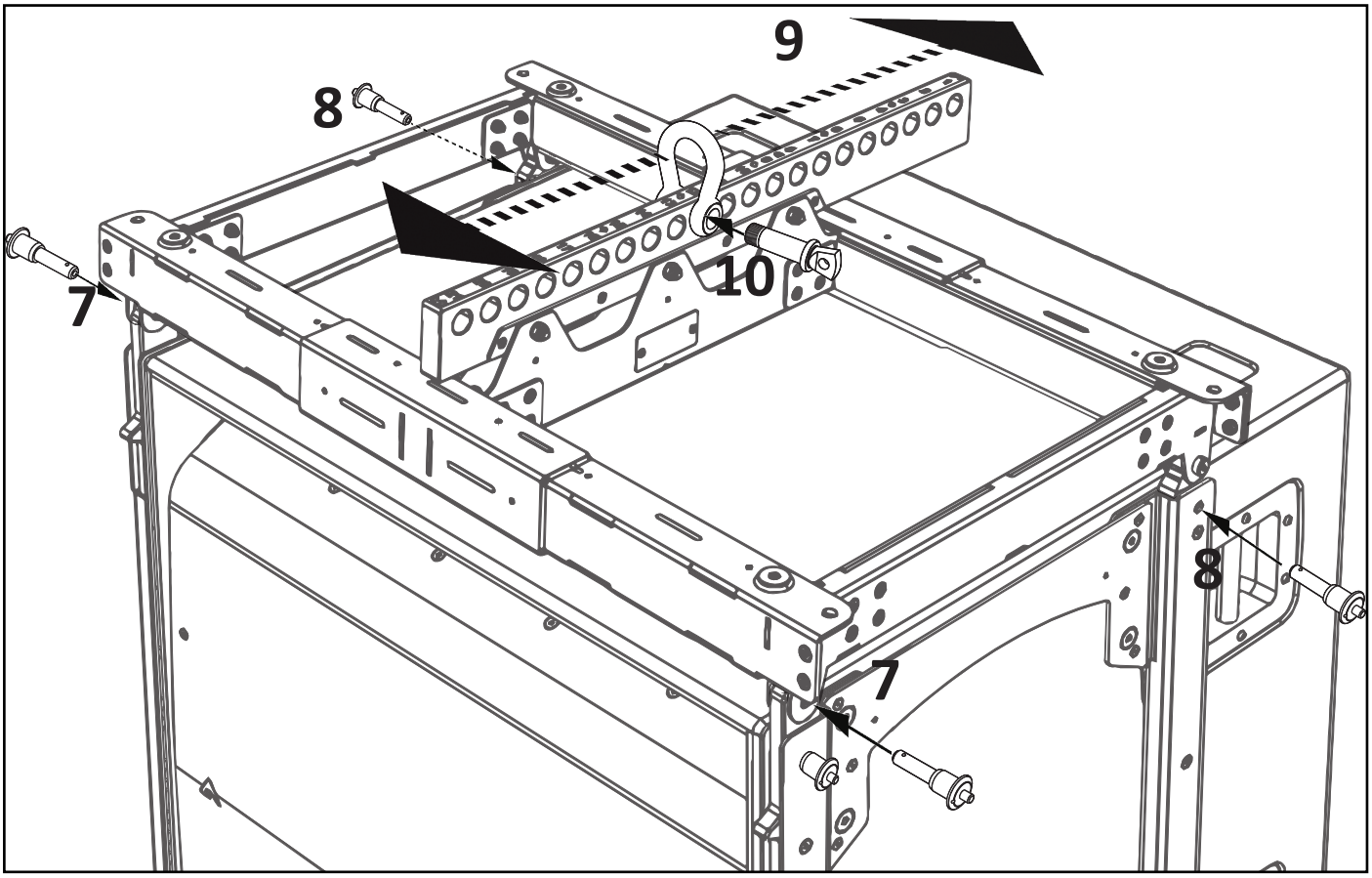


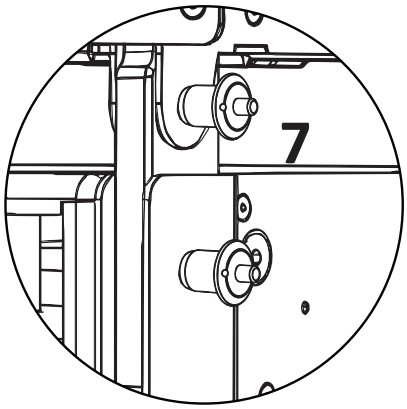


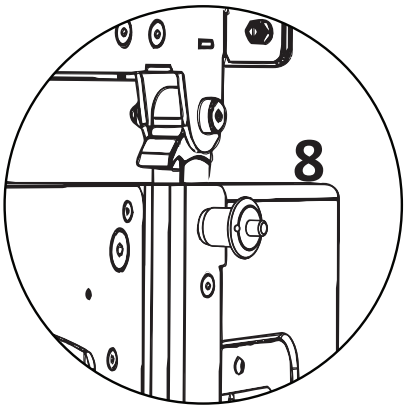
KPTAX2022 FLYING BAR ASSEMBLY SEQUENCE (continued)

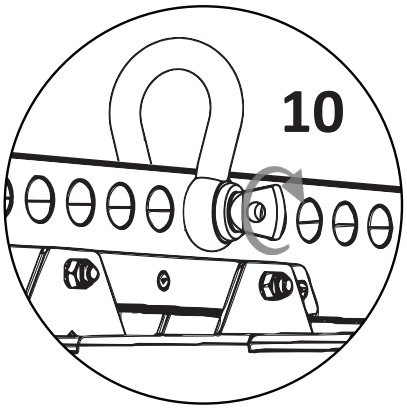
Next, reinsert the locking pins into the holes from which they were removed so that they pass through the mated lugs of the speaker enclosure and the flying bar at the front **(7)** and rear **(8)**. This secures the flying bar to the SW2421CFA.
Following the suspension hole index atop the flying bar, align the shackle with the suspension hole required **(9)**, as indicated by the software for the specific application. Insert and firmly tighten the shackle pin **(10)**, assuring that it is properly threaded and does not bind.

ATTENTION!
When installing any flown system, it is essential to adhere to all safety protocols and best rigging practices, including securely mousing shackles, using redundant safety anchor points, and implementing all other safety measures mandated by local or national regulations or codes.





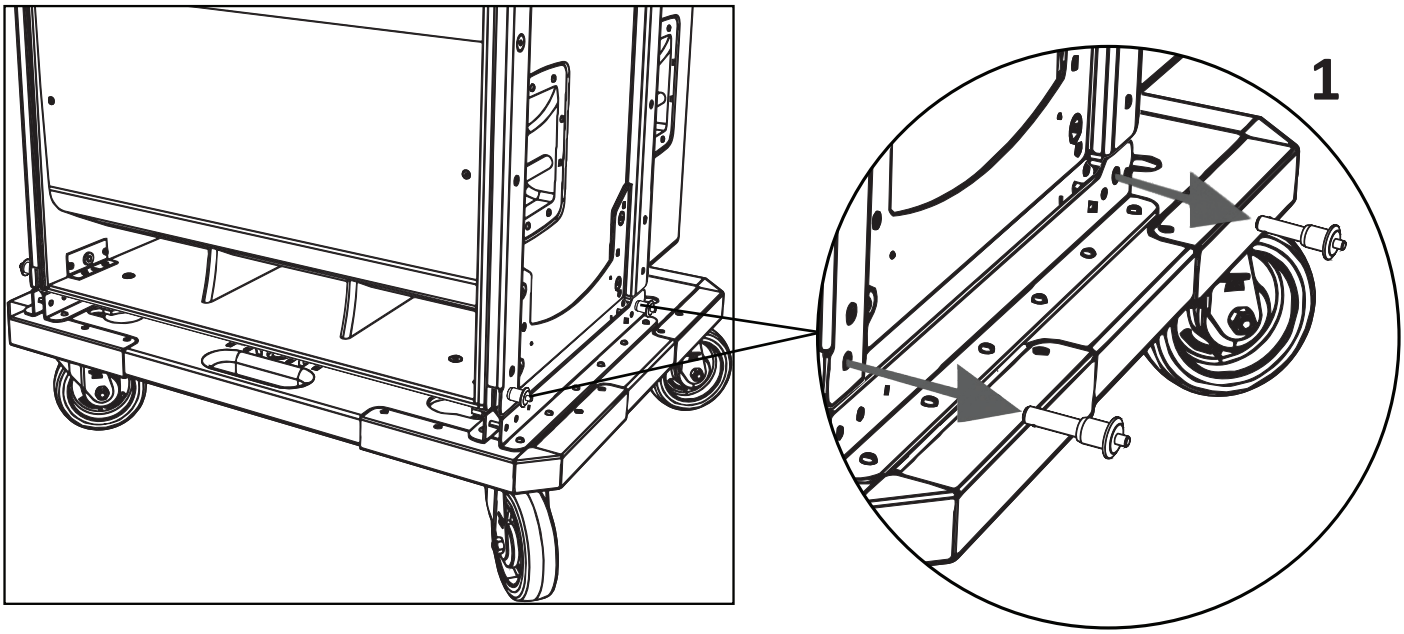


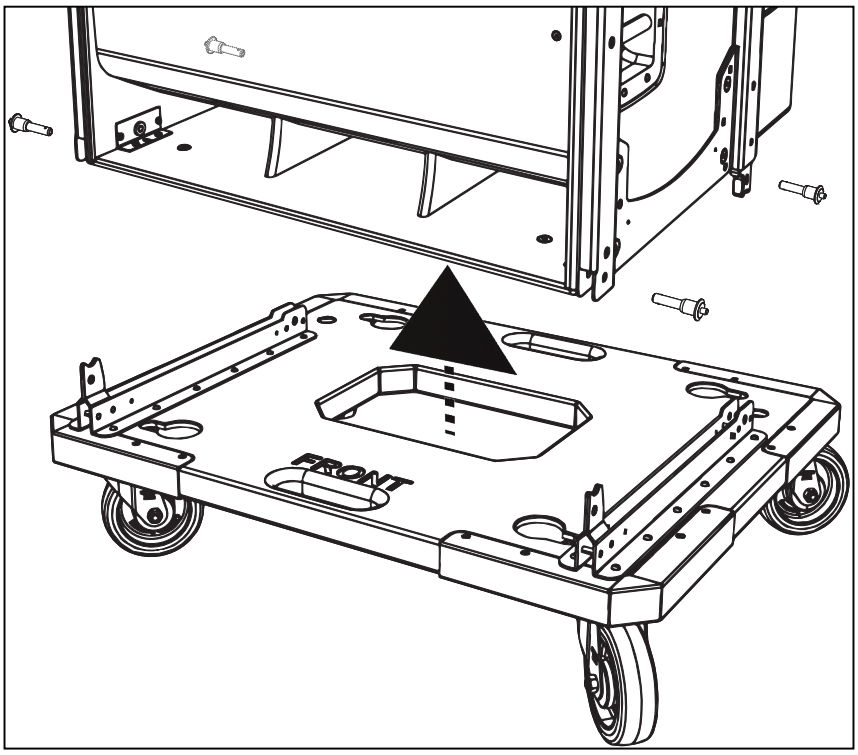


SW2421CFA SKATE REMOVAL

If the SW2421CFA being flown is equipped with the AXSKATESW2421 skate, this must be detached before hoisting. This can be done simply by removing the four locking pins – two on each side – from the bottom lugs of the subwoofer **(1)**. The skate will remain on the floor as the cabinet is lifted **(2)**.

WARNING!
Do not attempt to fly the SW2421CFA with the skate attached. AXSKATESW2421 is not designed to be suspended by its lugs and could create a danger to persons and equipment below. Doing so would also effect the weight and the center of gravity of any flown speaker(s).

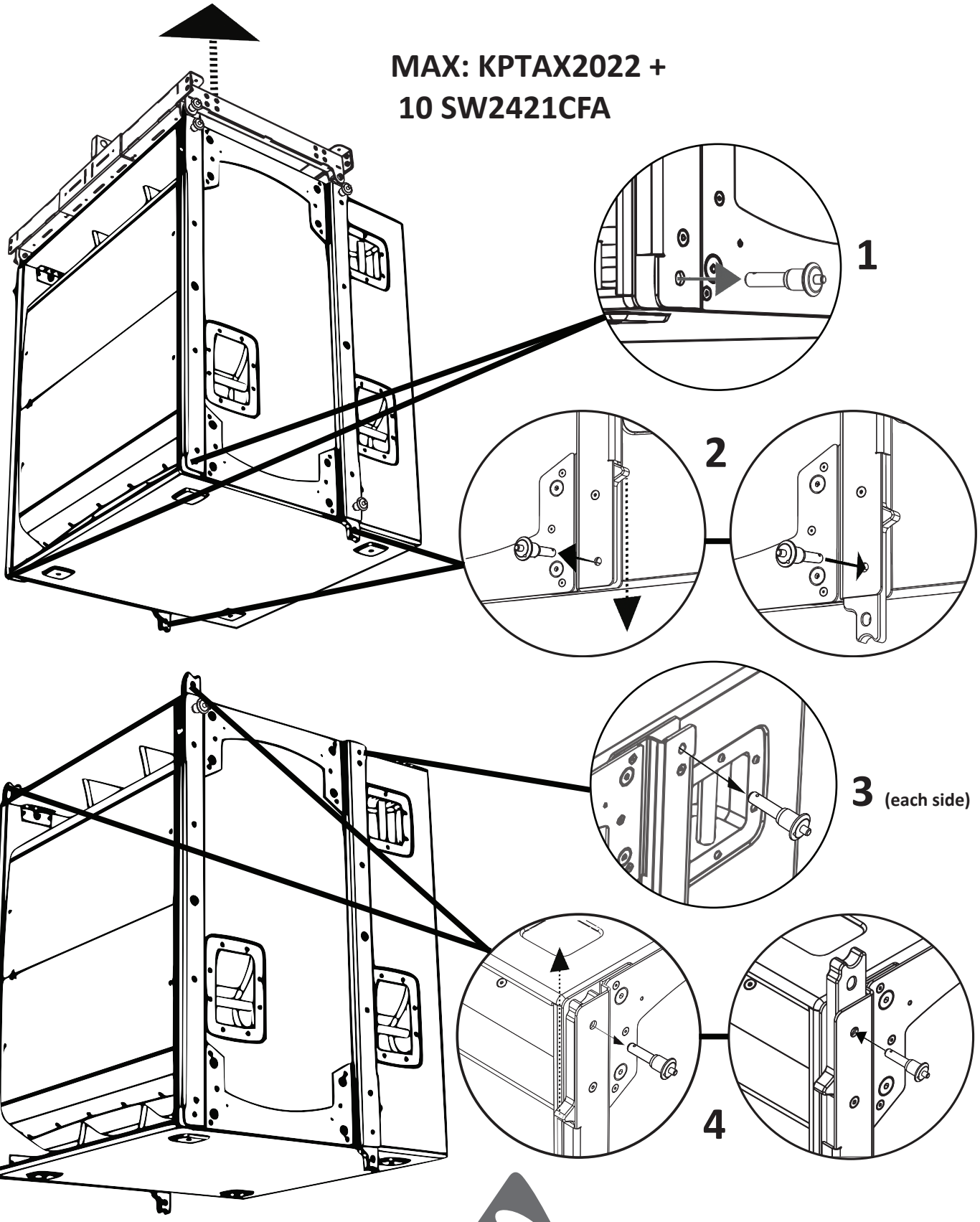




2

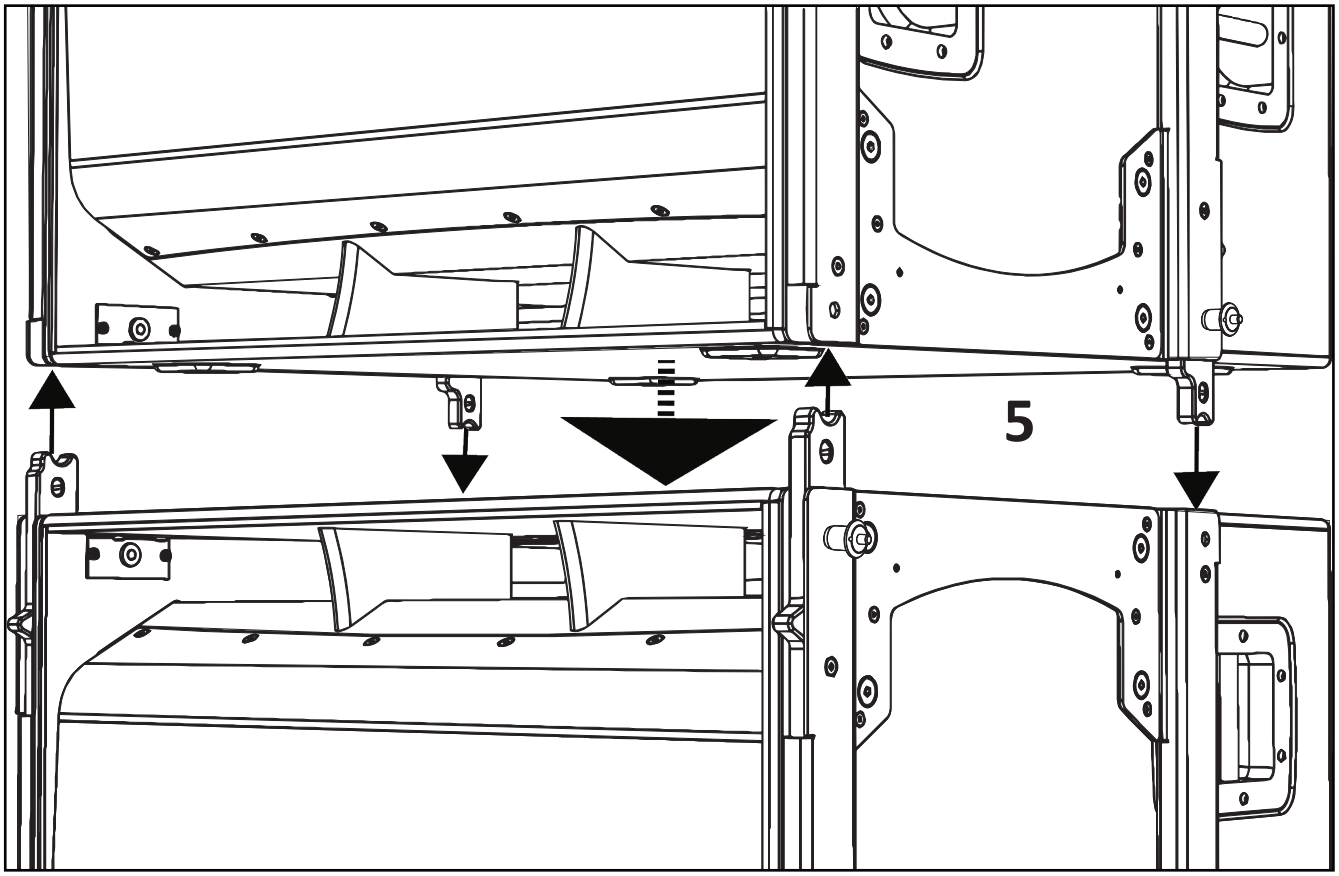
KPTAX2022 - SW2421CFA ARRAY ASSEMBLY SEQUENCE

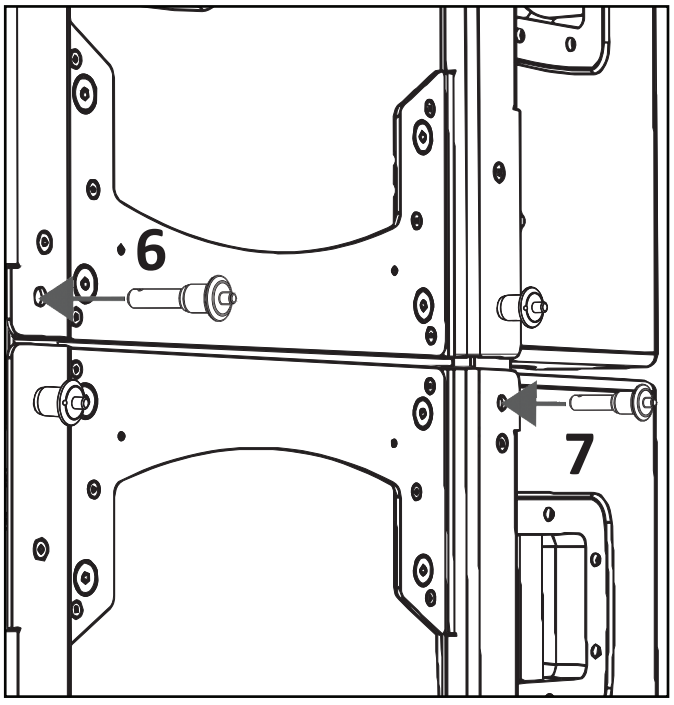
Coupling additional SW2421CFA units underneath the first of an array follows a similar procedure to attaching the flying bar. First, hoist the first unit to a height that allows the second unit to be positioned directly under it.
If they are still inserted, remove the locking pins from the forward bottom lugs of the upper SW2421CFA unit **(1)**.
Next, again if they are not already deployed, remove the pins to lower the rear extendable coupling lugs of the upper SW2421CFA, and lock them in the deployed position by replacing the pins **(2)**. Remove also the locking pins from the top rear lugs of the lower speaker **(3)**. Finally, remove the pins to raise the forward extendable coupling lugs atop the second SW2421CFA, locking also these in place by replacing the pins **(4)**.



KPTAX2022 - SW2421CFA ARRAY ASSEMBLY SEQUENCE (continued)

Lower the first SW2421CFA unit onto the second unit, aligning it so that the forward and rear lugs mate reciprocally with those of the second unit **(5)**.





When the four pairs of lugs are properly mated, with the extendable lugs engaged inside the open lugs, secure the two cabinets together by re-inserting the pins in both forward lugs at the bottom of the upper SW2421CFA **(6)** and in both upper rear lugs of the lower SW2421CFA **(7)**.

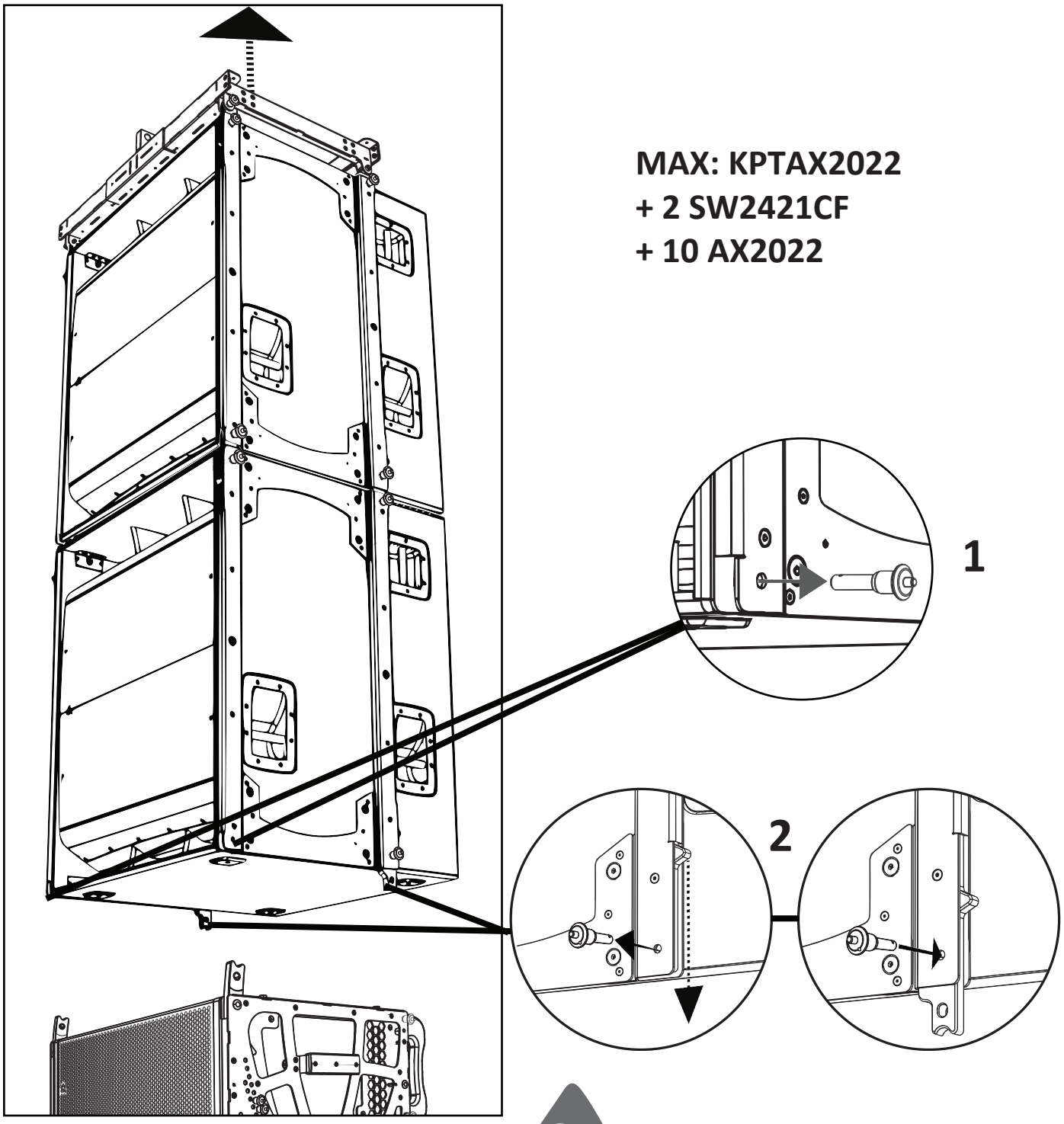
The two units are now secured together and can be hoisted together.

WARNING!
Take care that no hands, fingers, arms or other parts of the body ever enter the space between the two cabinets during this assembly process.

KPTAX2022 - SW2421CF - AX2022 ASSEMBLY SEQUENCE

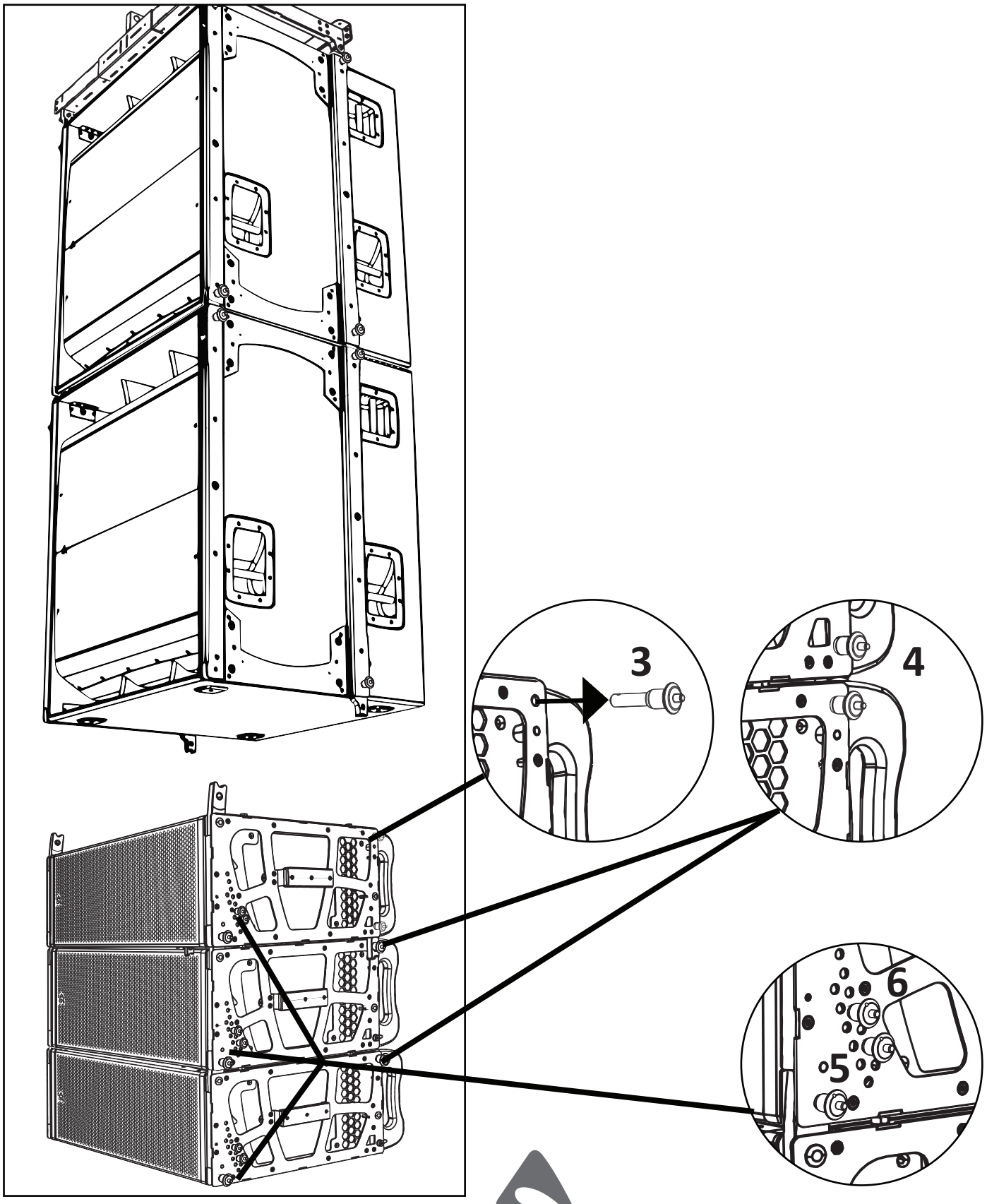
ATTENTION!
Suspending arrays of AX2022P/A units must be carried out according to specific procedures and in a specific sequence outlined in the dedicated product manual of those units. This section of this manual covers only the procedure for connecting the SW2421CFA/P units to the AX2022 units and assumes that the array of the latter units is correctly assembled and in the pre-hoisting configuration. Consult the appropriate AX2022 manual for this information.

Coupling AX2022 units in combined arrays with SW2421CFA/P units follows a similar procedure to assembling arrays of SW2421CFA/P.
First, hoist the SW2421CF unit(s) to a height that allows the upper section of a pre-assembled array of AX2022 units to be positioned directly under the hanging sub(s).
If they are still in place, remove the locking pins from the forward bottom lugs of the bottom SW2421CFP unit **(1)**.
Next, again if they not already deployed, remove the pins to lower the rear extendable coupling lugs of the bottom SW2421CFP, and lock them in the deployed position by replacing the pins **(2)**.



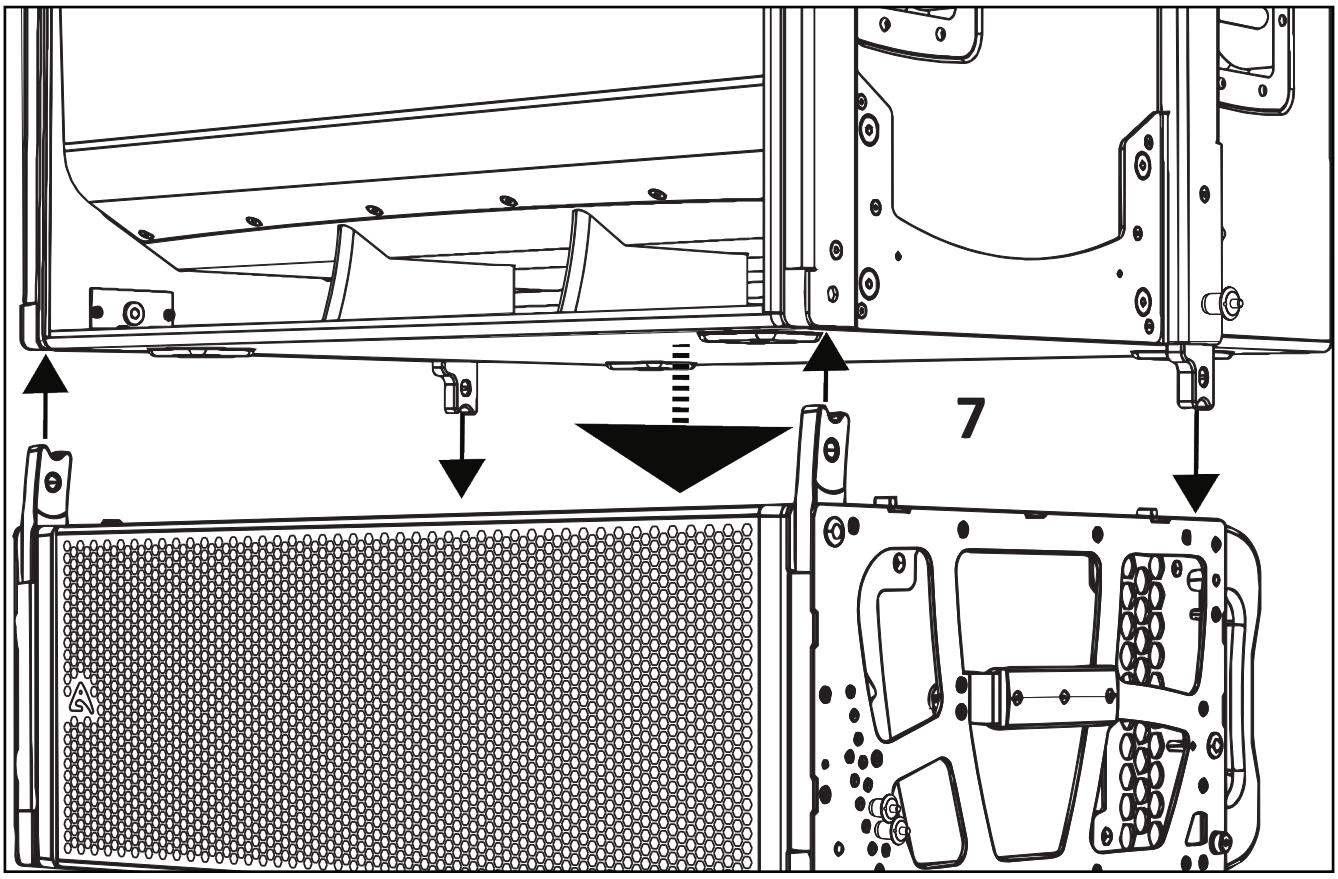
KPTAX2022 - SW2421CF - AX2022 ASSEMBLY SEQUENCE (continued)

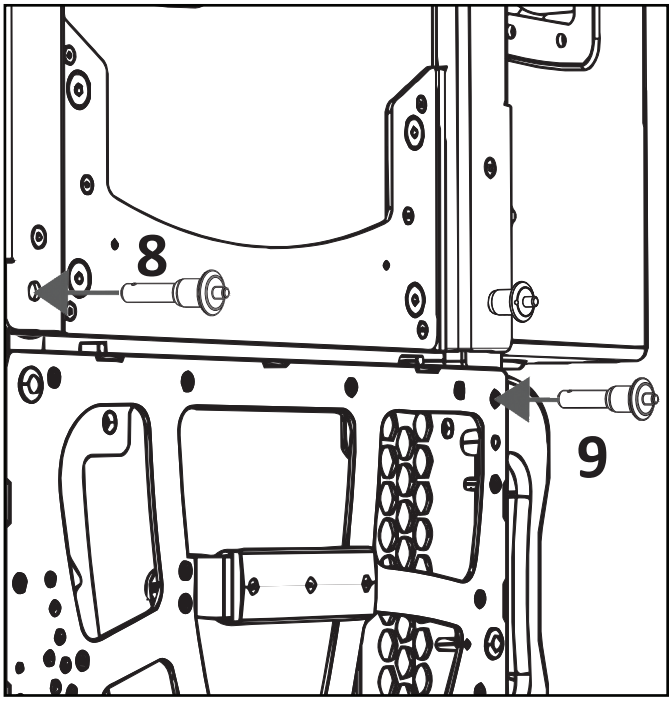
Once the bottom SW2421CF unit is prepared, remove the locking pin from the rear lugs of the top AX2022 unit **(3)** to allow the bottom extendable lugs of the SW2421CF unit to mate with them. Before lowering the subwoofer(s) to attach the AX2022 units, verify that the rear lugs of each of the lower AX2022 units is properly coupled to the successive unit **(4)**. Verify also that the forward sets of coupling lugs are properly mated and locked **(5)** and that the splay angle selection pins of each AX2022 unit are in the appropriate pin hole on each side **(6)**.



KPTAX2022 - SW2421CF - AX2022 ASSEMBLY SEQUENCE (continued)

Lower the SW2421CF unit(s) onto the AX2022 array, aligning it so that the forward and rear lugs of the subwoofer mate reciprocally with those of the top AX2022 unit **(7)**.





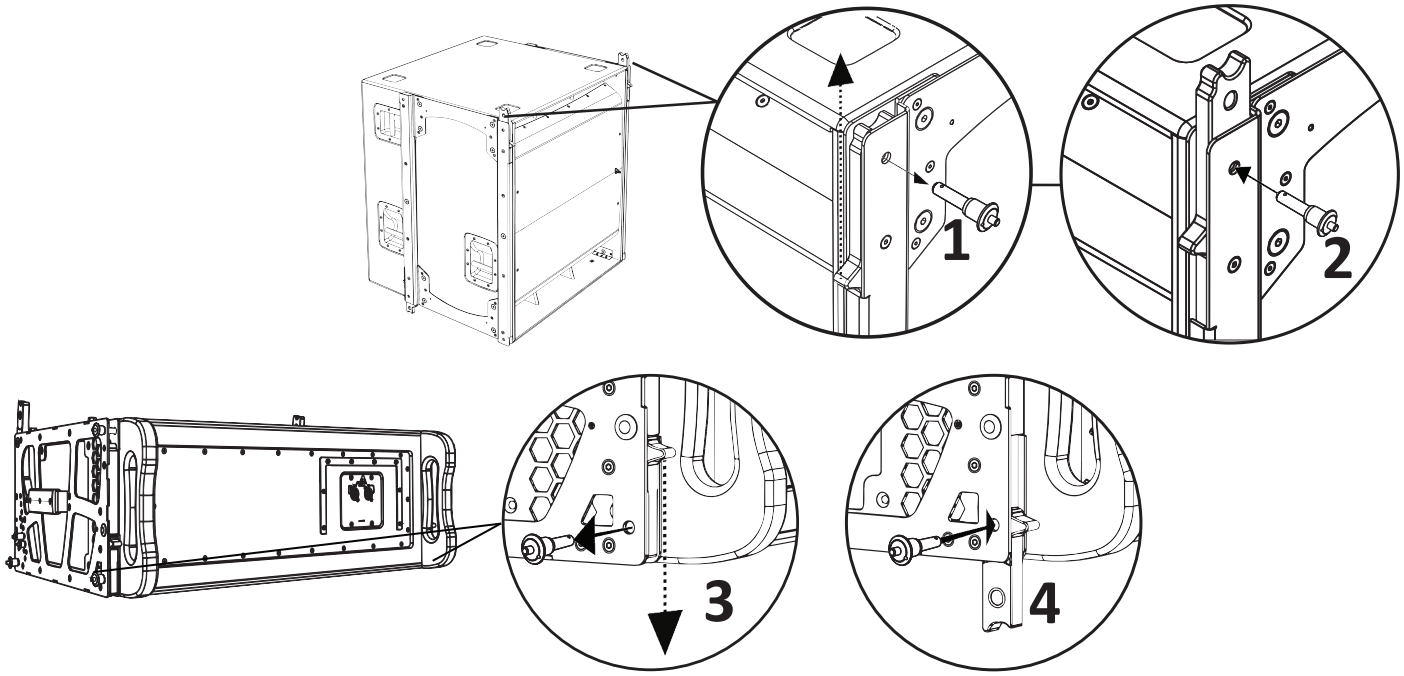
When the four pairs of lugs are properly mated, with the extendable lugs engaged inside the open lugs, secure the two cabinets together by re-inserting the pins in both forward lugs at each side of the bottom of the SW2421CF **(8)** and in both upper rear lugs of the top AX2022 **(9)**.
The two units are now secured together and ready for the process of hoisting and blocking the splay angles of the AX2022 units.

WARNING!
Take care that no hands, fingers, arms or other parts of the body ever enter the space between the two cabinets during this assembly process.

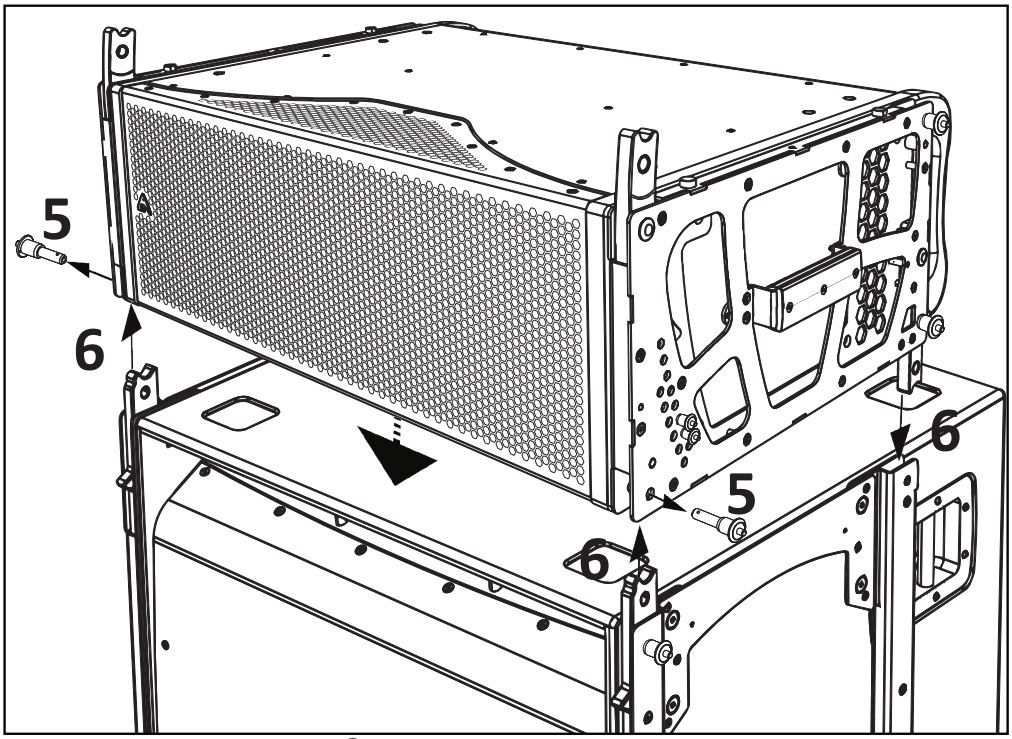
SW2421CF - AX2022 GROUND-STACKED DEPLOYMENT

Up to four AX2022 units can be stacked atop an SW2421CFA/P unit in sub/satellite configurations. If the SW2421CF unit being deployed is equipped with the AXSKATESW2421 skate, it must be detached from this and positioned directly on the ground or surface. To remove the skate, follow the instructions on **page 13**.
With the SW2421CF in position, begin by deploying the forward extendable coupling lugs atop the SW2421CF and locking them in place using the supplied locking pins **(1&2)**. If the rear extendable coupling lugs on each side of the bottom AX2022 are in the retracted position, remove the pins that retain these and extend the lugs completely **(3)**, locking them in the deployed position by replacing the pins **(4)**.

WARNING!
Do not attempt to mount AX2022 units atop the SW2421CFA/P while the latter still has the skate attached. AXSKATESW2421 is not designed to maintain stability with more than just the weight and height of a single SW2421CFA/P attached. Doing so would create a severe toppling risk and endanger persons and equipment.

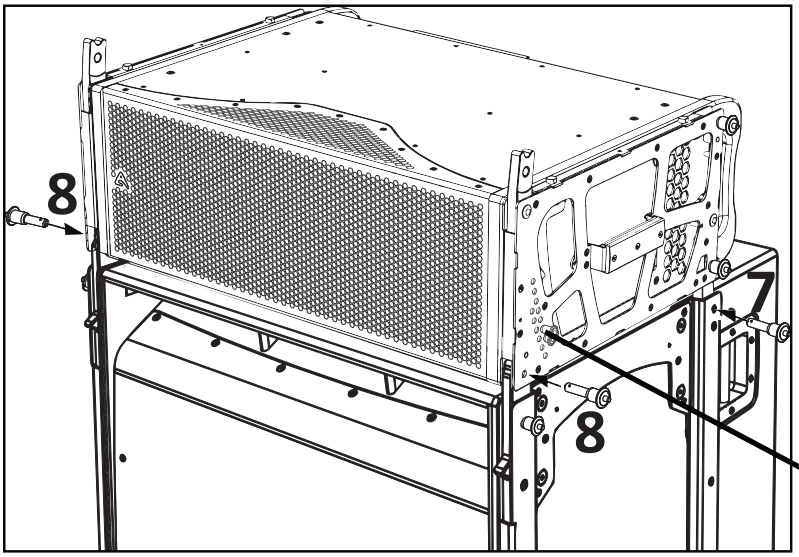


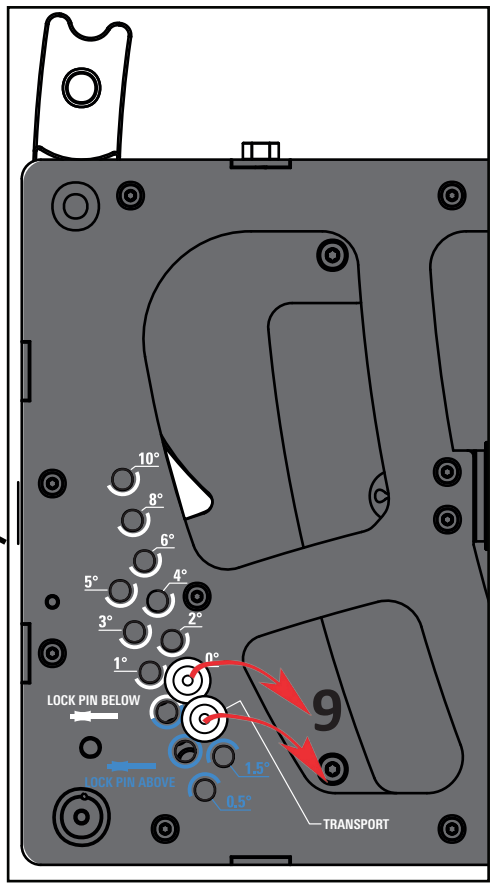
Remove also the locking pins from the bottom front lugs of the speaker **(5)**.
Lower the AX2022 onto the subwoofer, carefully aligning the four pairs of lugs so the front male lugs on the SW2421CF enter the female lugs on the bottom of the AX2022 and the rear male lugs on the AX2022 enter the female lugs on the sub **(6)**.

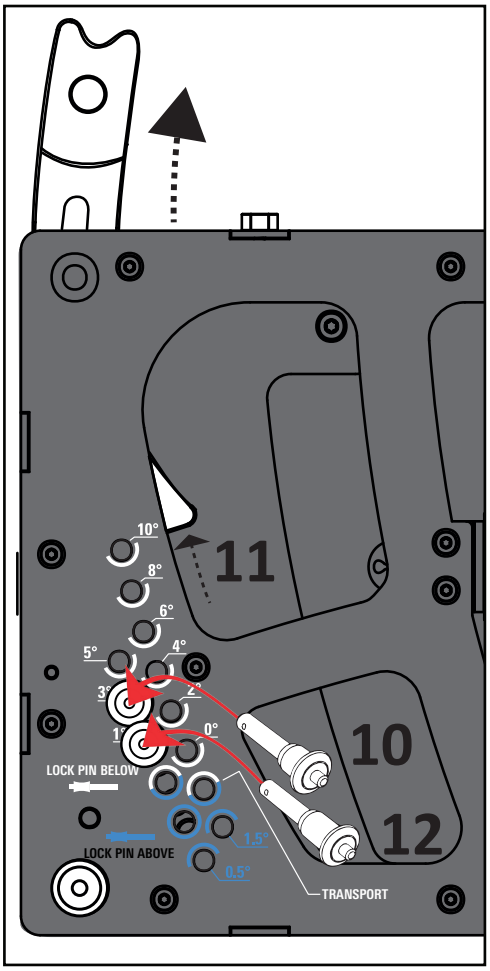


SW2421CF - AX2022 GROUND-STACKED DEPLOYMENT (continued)

When all four pairs of lugs are mated, re-insert the pins through each set of mated lugs at the rear **(7)** and front **(8)** of the enclosure, assuring that each pin is securely locked and cannot be removed without pressing the release. When all of the couplings are secure, further AX2022 units can be added.



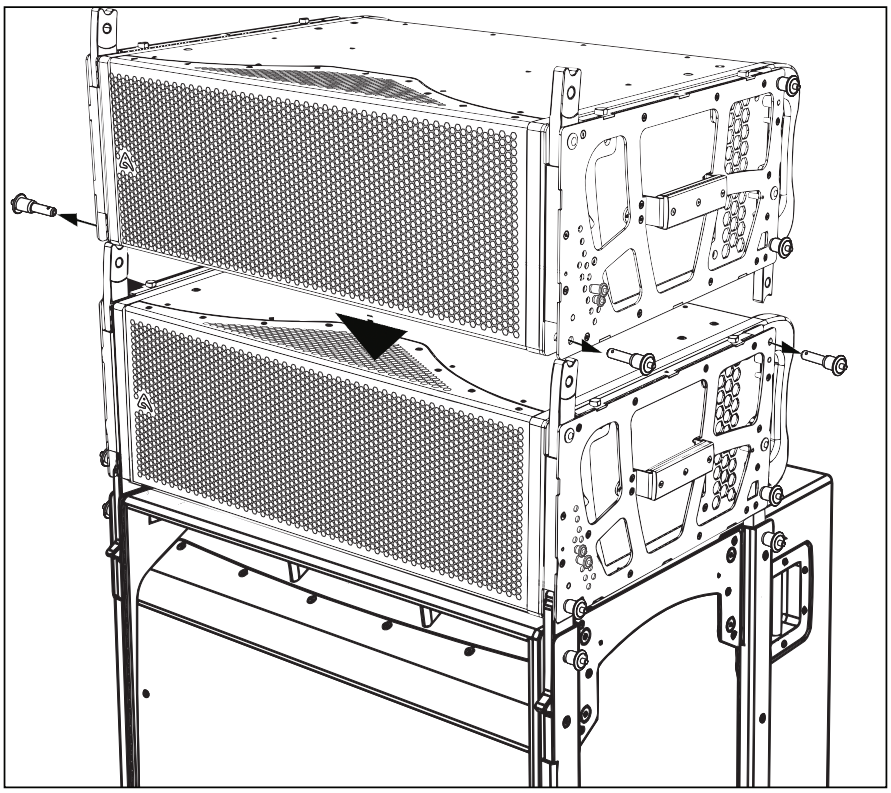


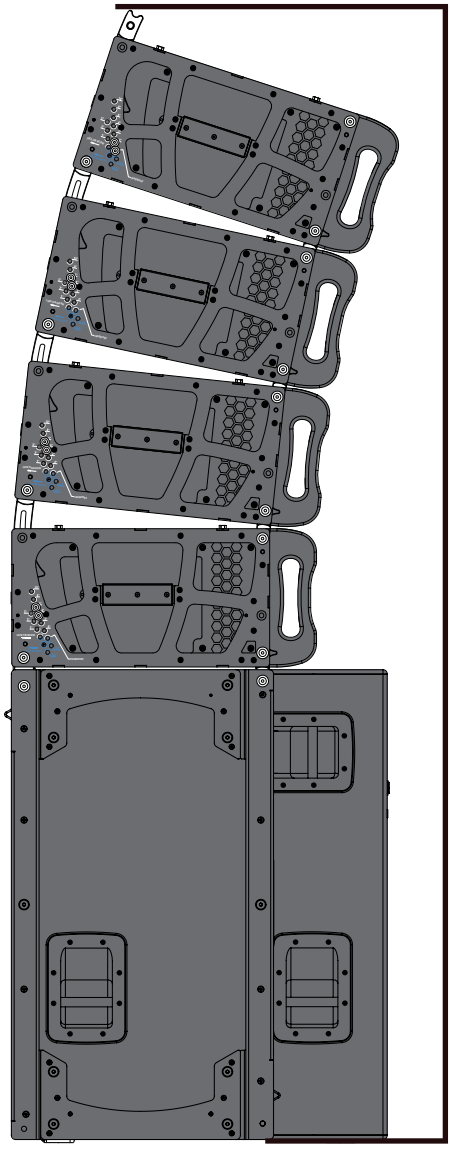


The splay angle between the first AX2022 enclosure and the SW2421CF is fixed at 0°. The splay angles of successive enclosures are selected in an ascending manner, starting by selecting and fixing that of the first enclosure. On each side of the enclosure, remove both of the 8 mm pins **(9)**. Next, insert the shorter Type A pin into the hole that selects the angle desired **(10)** – 3° in the figure – and use the handle of the lug on the side of the enclosure **(11)** to manually lift the lug until it stops at the correct angle and **(12)** insert the longer, Type B locking pin into the correct adjacent hole (refer to the table on page 16).
Verify that the lug is solidly locked into place and that each pin is locked and cannot be removed without pressing the release.
At this point, the next AX2022 can be added.

SW2421CF - AX2022 GROUND-STACKED DEPLOYMENT (continued)

Adding further AX2022 units to the stacked array follows an identical procedure to that of attaching the first to the SW2421CF, starting from the preparation of the enclosure (page 31).
Up to four AX2022 units can be safely deployed atop an SW2421CF, depending on the required total splay angle.





MAX:
1 SW2421CF
+ 1 AX2022
AT 0° SPLAY
+ 3 AX2022
AT 6° SPLAY
(18° TOTAL)

If the maximum number of four AX2022 units is deployed atop an SW2421CP, 6° is the maximum inclination for each of the three upper units.

FLOOR DEPLOYMENT POSITIONING

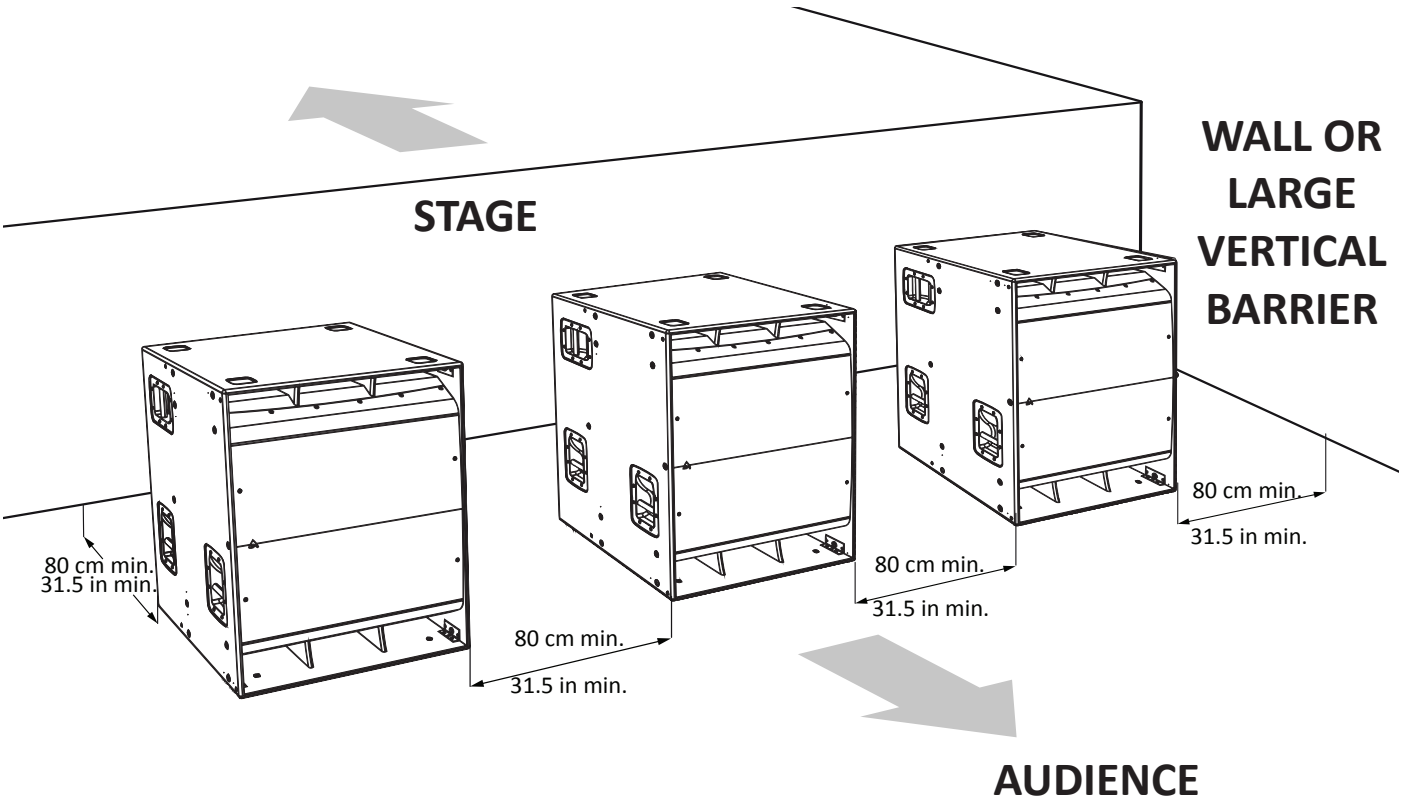
The internal pressure-gradient design of SW2421CA/CFA models allows cardioid, hypercardioid, and end-fire configurations directly via DSP presets using the two internal transducers. This eliminates the need for complex array setups or stacks with inverted cabinets. All three preset configurations of SW2421CA/FA provide some degree of reduced rear sound pressure to provide improved level control on stage.

However, some positioning guidelines must be followed in order to obtain optimal results from these subs.

First and foremost, unlike omnidirectional subs, the SW2421C models must always be positioned with the front of the cabinet oriented toward the area of the audience that it is intended to cover.

Second, when deployed side-by-side, each unit should be placed at a minimum lateral distance of 80 cm (31.5 in) from any other unit. Likewise, a minimum of 80 cm lateral distance must be maintained from any wall or large obstacle. Finally, in order for the unit to produce the required directional polar pattern, a minimum of 80 cm distance must also be allowed to the rear of the unit.

The EASE Focus software can be of great assistance in predicting and visualizing coverage, but this version of the software does not take into account reflections in the room or from obstacles.



PROCESSING PRESETS

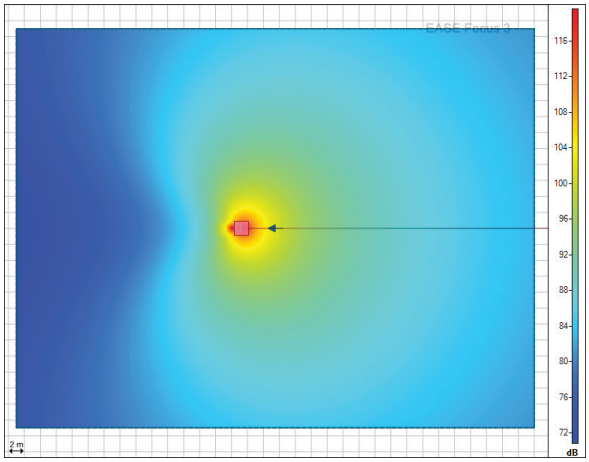
The integrated DSP/amplifier module in each SW2421CA/CFA unit is preprogrammed with three basic presets. The preset for each unit can be selected directly on the rear panel of the enclosure (see “PRESET” on page 7) or via the AUDIA control software while the units is connected through the network. Each of these three presets is designed to provide a general starting point for specific coverage applications.

Each of the presets is included in the .gll simulation file and can be used in coverage predictions within the EASE platform. The following are basic suggestions for the implementation of each preset. These are accompanied by calculated large-band polar patterns (A-weighted), here provided for the sole purpose of visual reference.

Cardioid Preset

The Cardioid processing preset (CARDIO) provides maximum rear rejection and stage control, ideal for applications requiring minimal low-frequency spill to the rear.

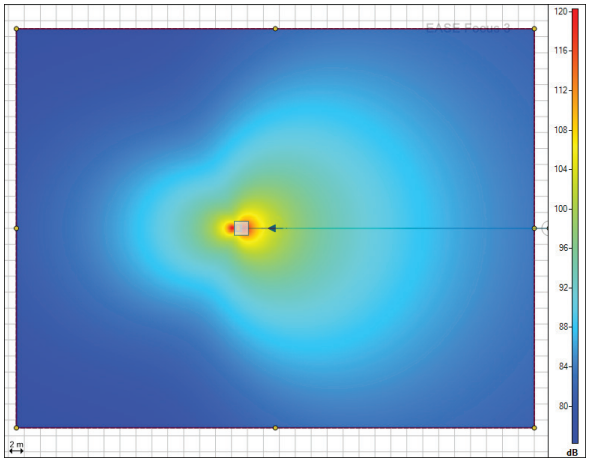
This configuration is suggested in particular for use in front of stages with live performers where maximum isolation is required between audience sound and stage monitoring sound.



Hypercardioid Preset

The HYPER (hypercardioid) preset provides narrower forward coverage with stronger directional focus and moderate rear energy.

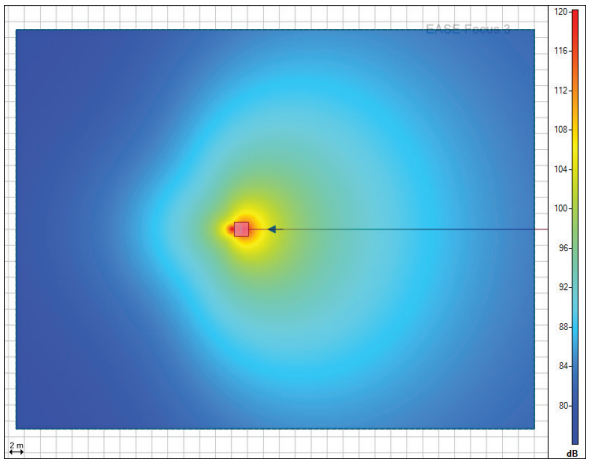
This configuration is suggested in particular for use when reflections from lateral obstructions could produce problematic reflections of bass frequencies. It should be used with caution in front of live stages, as some low-frequency energy emanates directly to the rear of the cabinet.



End-Fire Preset

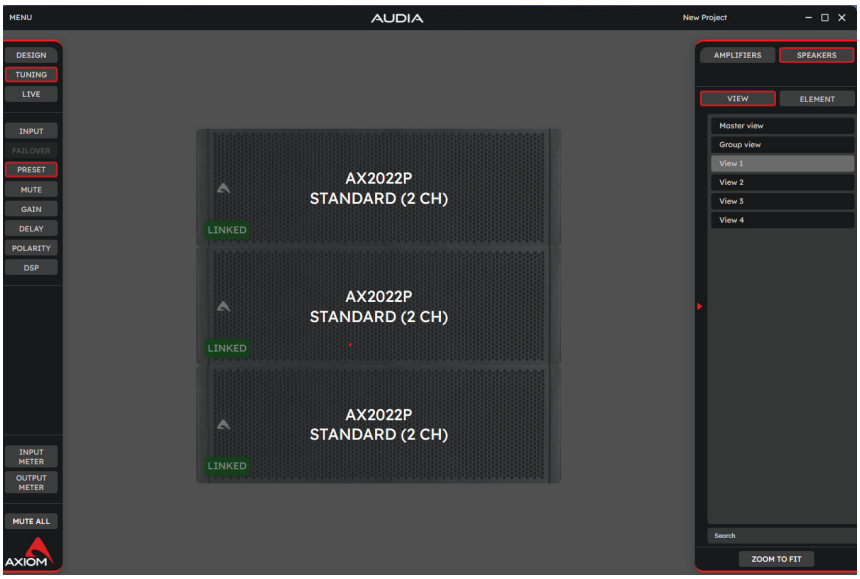
The EndFire configuration provides maximum forward summation and output, suited for applications requiring high-impact bass.

This configuration is useful for applications where high low-frequency energy is a priority, such as EDM performances.



SYSTEM DESIGN, CONTROL AND MONITORING

AUDIA



The AUDIA control software provides a PC-optimized graphical user interface that allows the user to position units and groups within the workspace in a layout that reflects their physical deployment. This visual correspondence between the software environment and real-world system topology improves clarity during setup, tuning and live operations.

The software is designed to provide comprehensive PC-based control and monitoring across a network of DSP-equipped amplifiers. Its workspace-driven architecture assists the user in the configuration of processing, group management, device monitoring, and real-time adjustment of system parameters. The interface supports both individual-unit control and group-level workflows, ensuring efficient management of complex audio systems.

With integrated real-time feedback, intuitive navigation and a scalable architecture, Audia serves as the primary control environment for the design, optimization, and operation of DSP-driven amplification networks.

Design Mode features include IP address and labeling management for active speaker enclosures, amplifier units and the passive enclosures and subwoofers driven by these. It includes control of preset configurations from manufacturer libraries, input management, and device grouping. The user can adjust input trim, levels, delays, and routing. Active devices and speakers can be organized into groups for simplified control. Projects can be saved and reloaded with full configurations. All of these functions can be carried out without virtually, before any actual DSP is connected to the network.

Tuning Mode allows rapid setup of the system on site. Elements that have been pre-arranged virtually can then linked to physical units. Amplifier synchronization modes include Online to Virtual and Virtual to Online for configuration transfer. During system tuning detailed adjustments of input, presets, gain, delay, polarity, and DSP settings are available, while EQ filters and visual monitoring are accessible.

Live Mode enables real-time control of gain, delay, and DSP parameters during operation, as well as precise system and fault monitoring.

IMPORTANT
For more information, consult the dedicated manual of the AUDIA software and AUDIA/Q-NEX+ ecosystem.

Single Network Configuration

Here is a simplified diagram of a complete system of AX2022A and SW2421CA/CFA, monitored from a PC running the AUDIA software over a single network. Digital audio signals from Front-of-House are transported together with the control network data using MILAN, via a fully AVB-compliant network. Analog audio can be traditionally routed to the enclosures for the purpose of redundancy.
The network can be expanded and extended over distance using, for example, optical fiber systems, as long as all network devices are AVB-compliant.

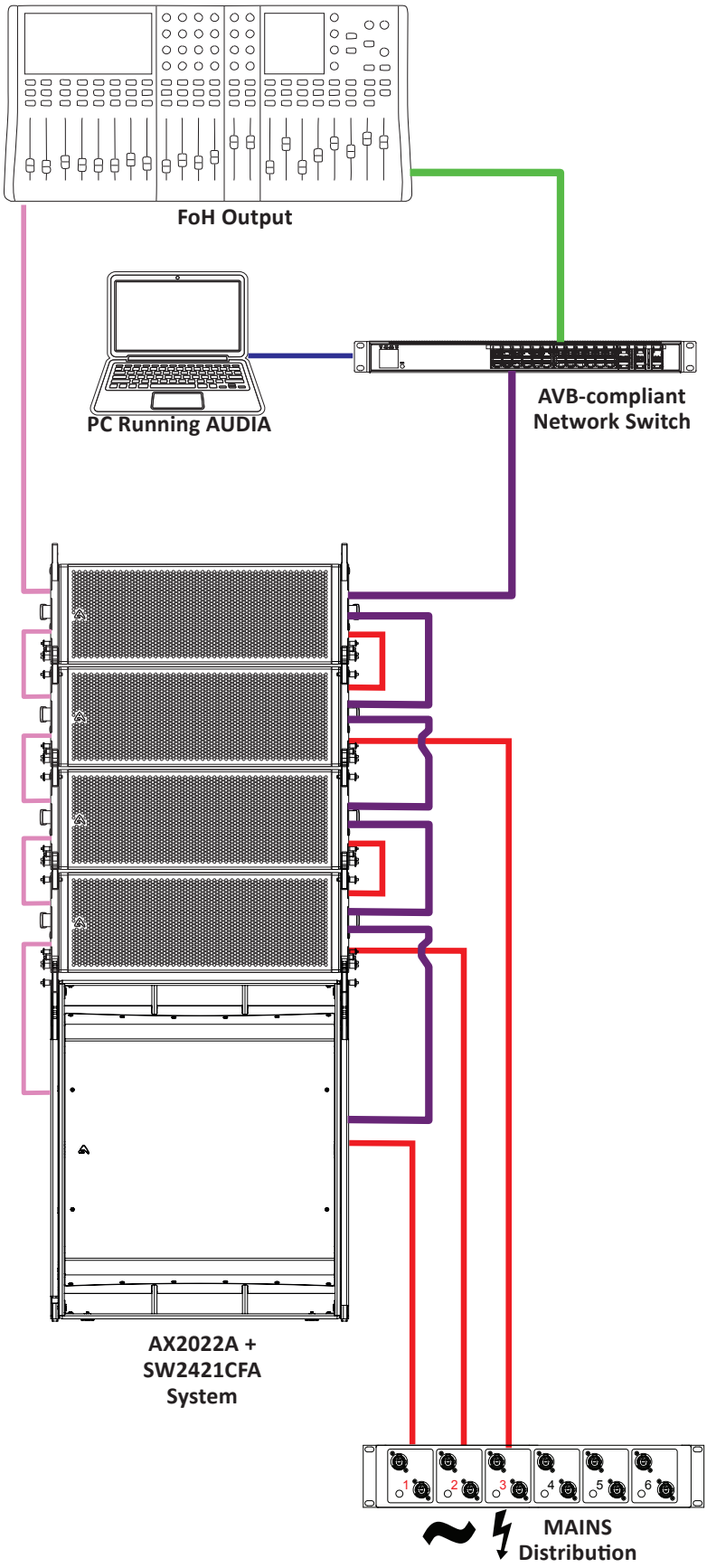
Control Network

Analog Source Audio (Backup)

Digital Source Audio (direct from console or via AVB bridge)

Digital Audio + Control Data via MILAN

AC Mains distribution (230 VAC 16 A EU/ 117 VAC 20 A US)



SW2421CA Connections

