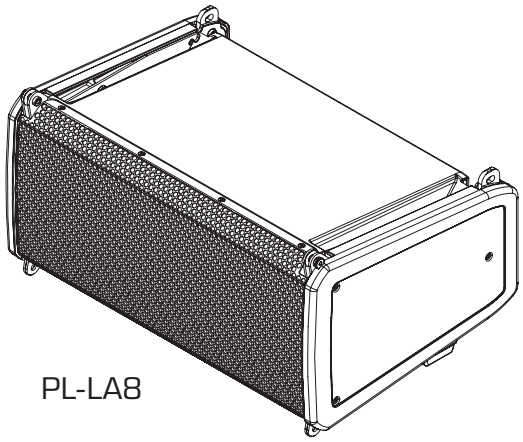
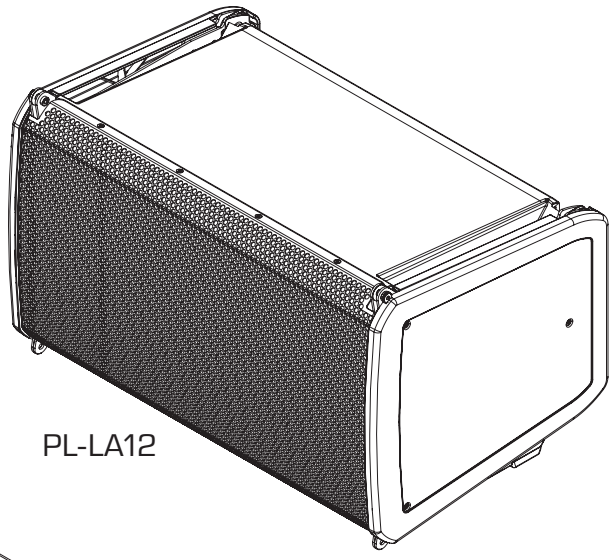
PL-LA Series User Manual

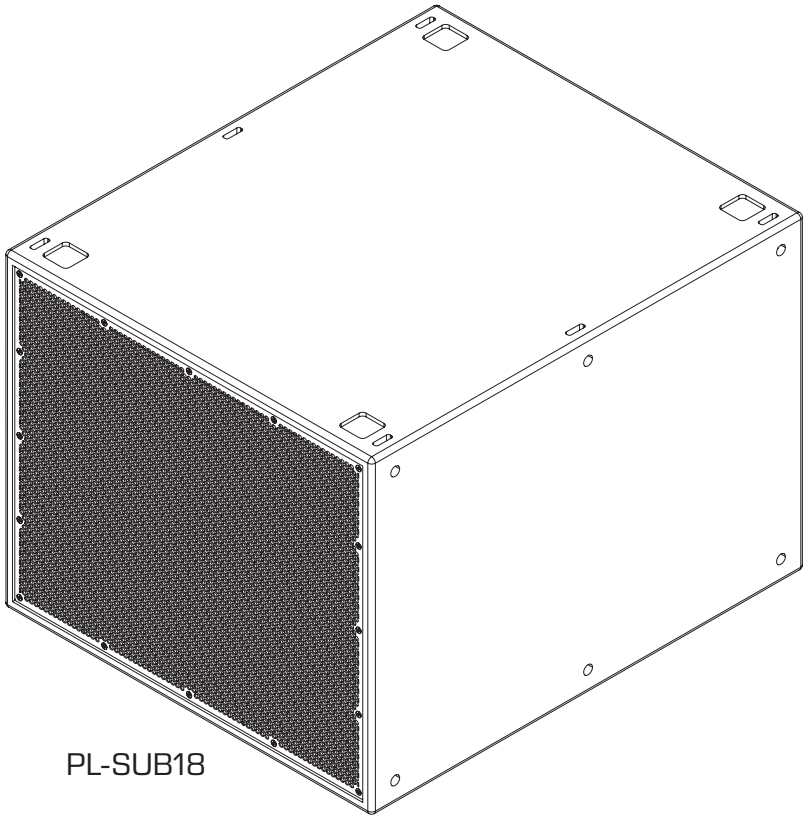
Two-Way Passive Installation Line Arrays and Subwoofer



PL-LA8



PL-LA12



PL-SUB18

TD-001680-01-B

Contents

EXPLANATION OF SYMBOLS

The term "**WARNING!**" indicates instructions regarding personal safety. If the instructions are not followed, the result may be bodily injury or death.

The term "**CAUTION!**" indicates instructions regarding possible damage to physical equipment. If these instructions are not followed, it may result in damage to the equipment that may not be covered under the warranty.

The term "**IMPORTANT!**" indicates instructions or information that are vital to the successful completion of the procedure.

The term "**NOTE**" is used to indicate additional useful information.

The lightning flash with arrowhead symbol in a triangle alerts the user to the presence of uninsulated dangerous voltage within the product's enclosure that may constitute a risk of electric shock to humans.

The exclamation point within a triangle alerts the user to the presence of important safety, operating, and maintenance instructions in this manual.

IMPORTANT SAFETY INSTRUCTIONS

WARNING!: While it is possible for one person to lift a loudspeaker, it is important to use proper lifting techniques. Suggested reading: OSHA Technical Manual (OTM) > Back Disorders and Injuries: https://www.osha.gov/otm/

1. Read, follow, and keep these instructions.
2. Heed all warnings.
3. Clean only with a dry cloth.
4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
5. Only use attachments/accessories specified by the manufacturer.
6. Refer all servicing to qualified service personnel.
7. Adhere to all applicable, local codes.
8. Consult a licensed, professional engineer when any doubt or questions arise regarding a physical equipment installation.
9. Suspension of this product should be done by qualified persons following safe rigging practices. Other limitations may apply.
10. Use only the recommended system components and suspension hardware intended for use with this product as directed by this manual.
11. Do not use Q-SYS suspension hardware for purposes outside the scope of this manual.

WARNING!: Read and follow the installation instructions carefully. If these products are not suspended properly, they could fall, causing personal injury or death and damage to the equipment. Refer to the user manual for rules on suspension.

RoHS Statements

The Q-SYS PL Series loudspeakers are in compliance with European RoHS Directive.

The Q-SYS PL Series loudspeakers are in compliance with "China RoHS" directives. The following table is provided for product use in China and its territories.

	Q-SYS PL Series					
部件名称 (Part Name)	有害物质 (Hazardous Substances)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(vi))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电路板组件 (PCB Assemblies)	X	O	O	O	O	O
机壳装配件 (Chassis Assemblies)	X	O	O	O	O	O

本表格依据 SJ/T 11364 的规定编制。

O: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

（目前由于技术或经济的原因暂时无法实现替代或减量化。）

This table is prepared following the requirement of SJ/T 11364.
O: Indicates that the concentration of the substance in all homogeneous materials of the part is below the relevant threshold specified in GB/T 26572.
X: Indicates that the concentration of the substance in at least one of all homogeneous materials of the part is above the relevant threshold specified in GB/T 26572.
(Replacement and reduction of content cannot be achieved currently because of the technical or economic reason.)

Rigging Safety Regulations and Protection Ratings:

Product Configurations covered by this manual are designed and tested for compliance to the following regulations and standards:

- 2001/95/EC General Product Safety Directive
- EN 62368-1
- IEC 60529 IP54
- 305/2011/EU Construction Products Regulation
- EN 1991-1-1, EN 1993-1-1, EN 1993-1-8, EN 1999-1-1
- ANSI E1.8-2018

See "Rigging Safety Precaution" on page 12.

Warranty

For a copy of the Q-SYS Limited Warranty, visit the Q-SYS website at www.qsys.com.

NOTE: Read and follow these instructions carefully. If the loudspeakers are not suspended properly, they could fall, causing personal injury and damage to the equipment. Please refer to the Flown Deployment chapter of the User Manual for rules on suspension.

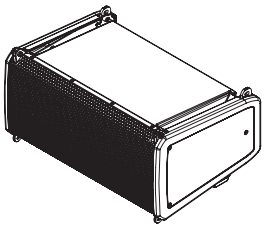
Introduction

The Q-SYS PL-LA family consists of two-way, passive installation line arrays known for delivering premium sound across a wide range of settings - from entertainment venues to corporate auditoriums. Designed for small to medium-sized spaces, the PL-LA models (8-inch and 12-inch) offer high-performance front-of-house solutions. They feature the QSC Length-Equalized Acoustic Flare™ (QSC LEAF™) Waveguide, optimizing internal sound paths for top-notch acoustic performance. The PL Series performance loudspeakers combine a legacy of high-performance audio with the versatility of Q-SYS, providing an integrated audio, video, and control experience for front-of-house applications.

Key Features and Technologies

- PL-LA12: 12-inch LF transducer & HF compression driver in a bass-reflex enclosure
- PL-LA8: 8-inch LF transducer & HF compression driver in a bass-reflex enclosure
- Weatherized (IP54) ABS enclosure for indoor and protected outdoor environments
- PL-SUB18: 18-inch, 4-inch voice coil, subwoofer in bass reflex enclosure
- Superior acoustic performance via QSC LEAF™ Waveguide
- Pair with Q-SYS CX-Q network amplifiers for advanced system optimization through custom voicing and filter sets

What's in the Box

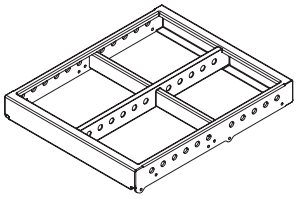


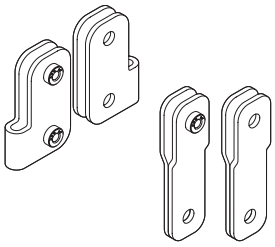
(1) PL-LA8/PL-LA12 ARRAY LOUDSPEAKER UNIT

(1) CO-000981-01 CONNECTOR 4 POLES

(1) SG-000728-01 INPUT COVER FOR IP65

(6) SC-000814-01 SCREWS FOR INPUT COVER





PL-LA8-AF:

(4) SC-000777-01 RIGGING SHOULDER BOLTS

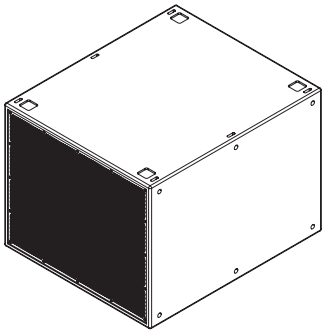
(2) CH-008429-01 REAR LINK

PL-LA12-AF:

(8) SC-000777-01 RIGGING SHOULDER BOLTS

(2) CH-008429-01 REAR LINK

(4) CH-008430-01 Y-LINK

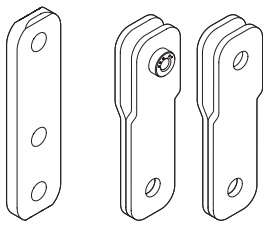


(1) PL-SUB18 SUBWOOFER UNIT

(1) CO-000981-01 CONNECTOR 4 POLES

(1) SG-000728-01 INPUT COVER FOR IP65

(6) SC-000814-01 SCREWS FOR INPUT COVER



(4) CH-008428-01 STRAIGHT LINK

(2) CH-008430-01 Y-LINK

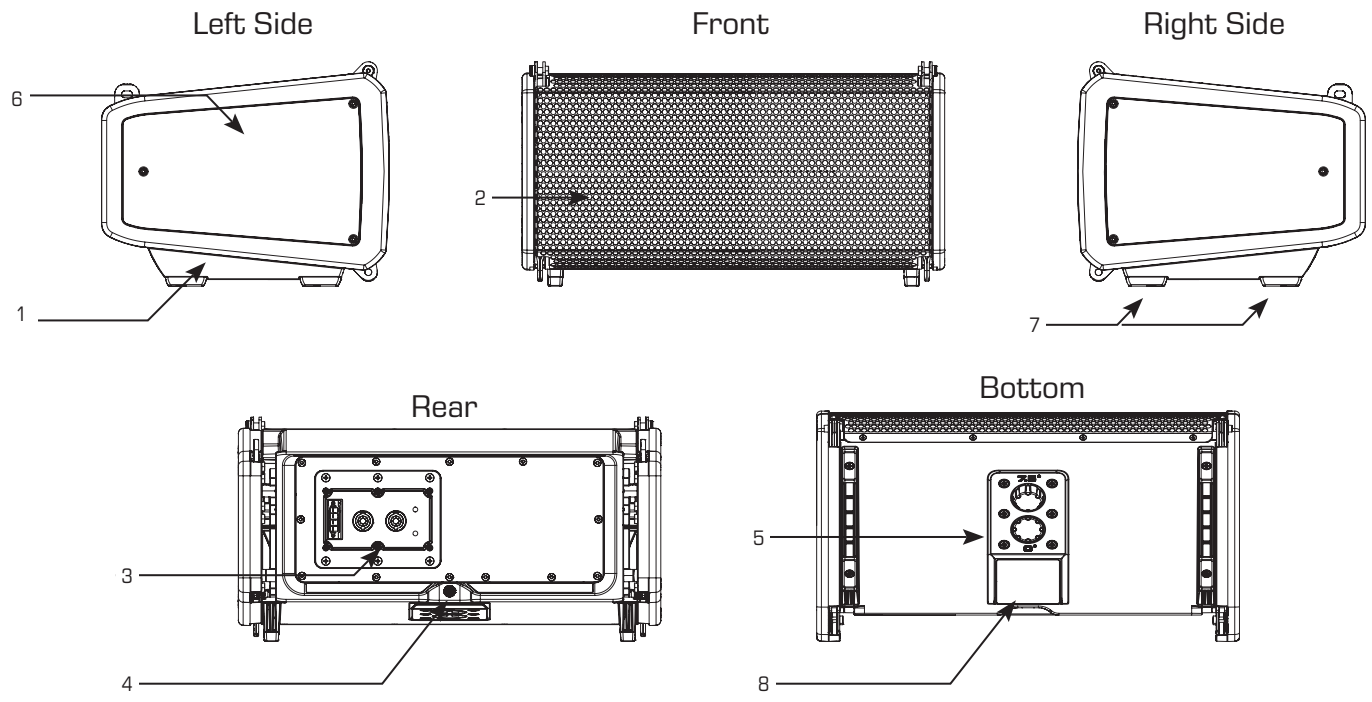
(1) TD-001688-00 SAFETY & REGULATORY STATEMENTS, PL-LA/PL-DC SERIES

(1) WARRANTY STATEMENT, ENGLISH VERSION

SC-000777-01

RIGGING SHOULDER BOLTS (M6-6.5mm screw with M8 shoulder L=10mm class 12.9.)

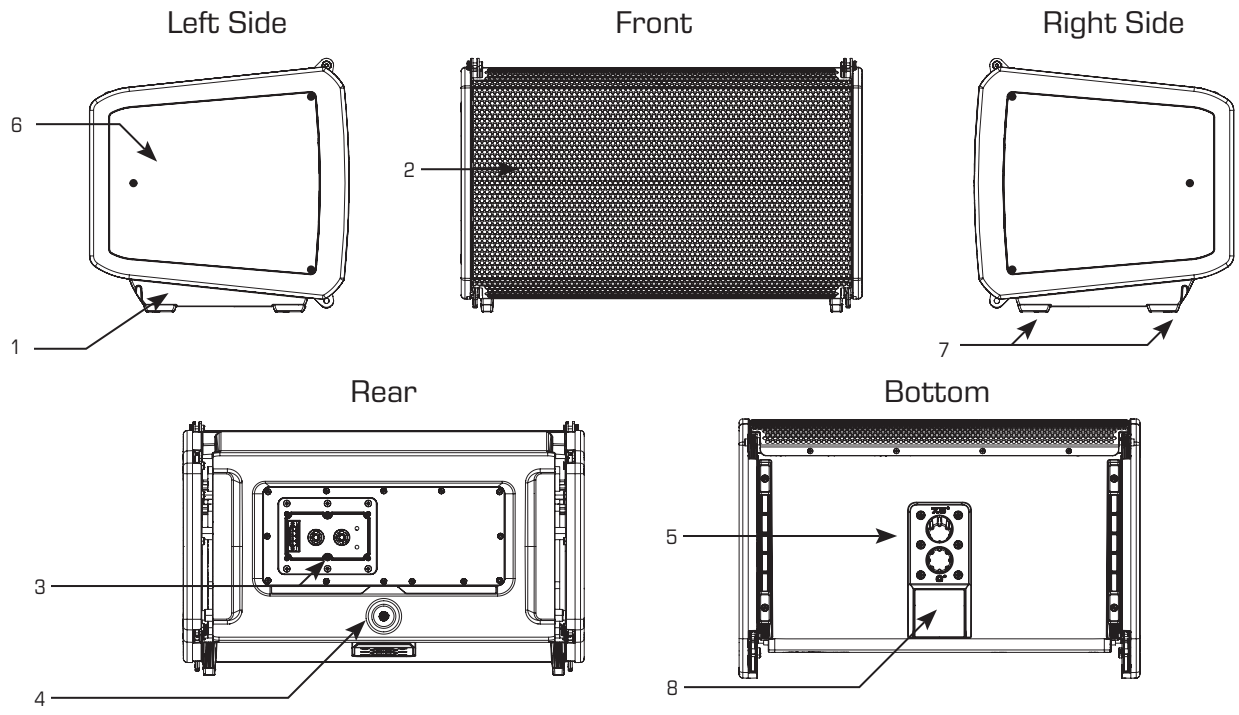
PL-LA8 Features



— Figure 1 —

1. ABS enclosure
2. Weatherized steel grille
3. Rear panel input cup
4. M10 pull back point
5. Dual-angle, 35 mm pole socket (0° or -7.5°)
6. Removable side panel
7. Slip-resistant feet
8. Working Load Limit (WLL) indication

PL-LA12 Features



— Figure 2 —

1. ABS enclosure
2. Weatherized steel grille
3. Rear panel input cup
4. M10 pull back point
5. Dual-angle, 35 mm pole socket (0° or -7.5°)
6. Removable side panel
7. Slip-resistant feet
8. Working Load Limit (WLL) indication

Rigging System Features

PL-LA8

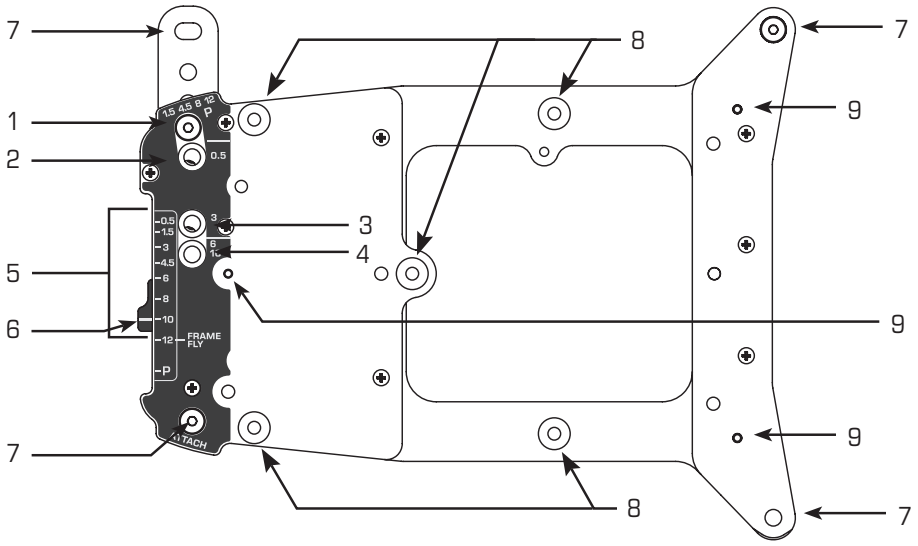


Figure 3

1. Fastener Location for 1.5° 4.5° 8° 12° angles, Array Frame connection (FLY) and parking
2. Fastener Location for 0.5° angle
3. Fastener Location for 3° angle
4. Fastener Location for 6° 10° angles
5. Angle Selection
6. Slider for angle selection
7. Four attachment points
8. Side panel guide grommet holes
9. Side panel screws

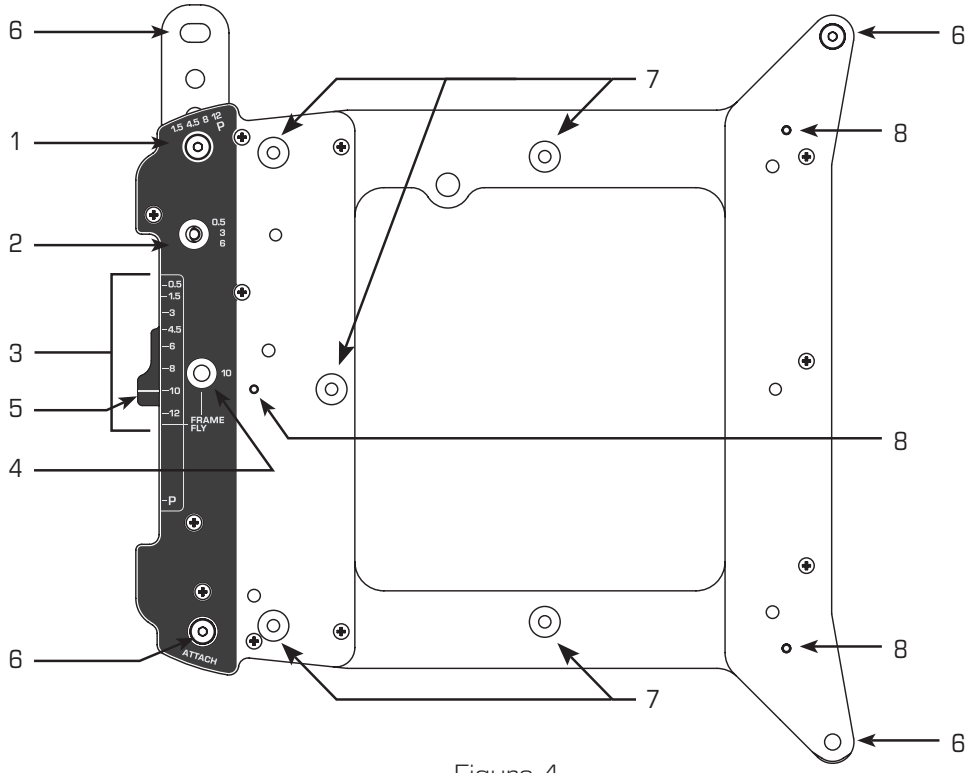
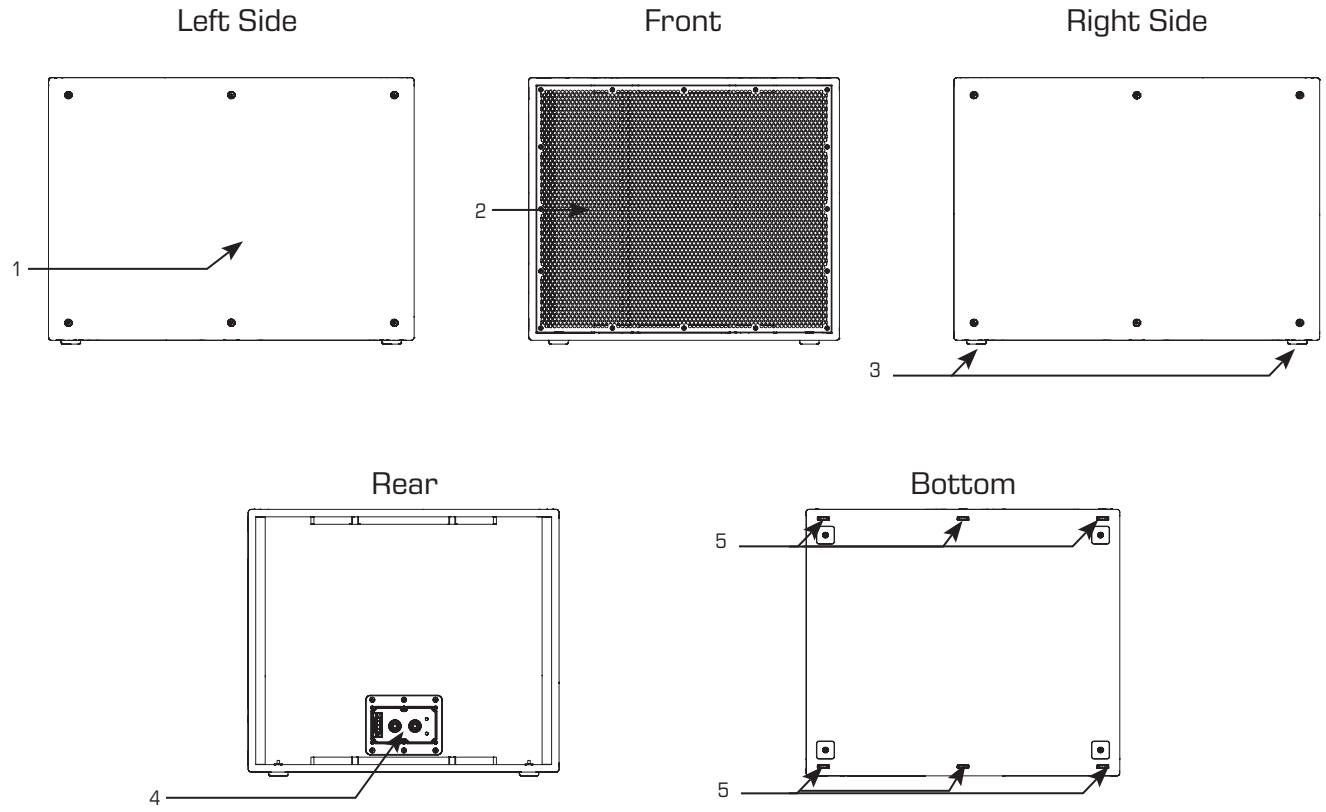


Figure 4

1. Fastener Location for 1.5° 4.5° 8° 12° angles and parking
2. Fastener Location for 0.5° 3° 6° angles
3. Angle selection
4. Locking 10° angle and Array Frame connection (FLY)
5. Slider for angle selection
6. Four attachment points
7. Side panel guide grommet holes
8. Side panel screws

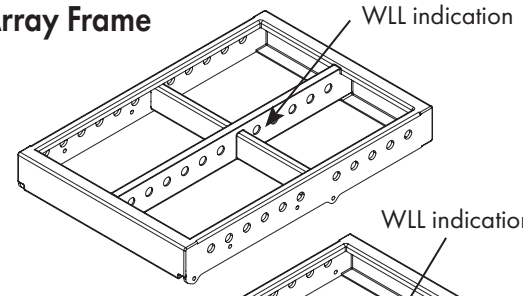
PL-SUB18 Features



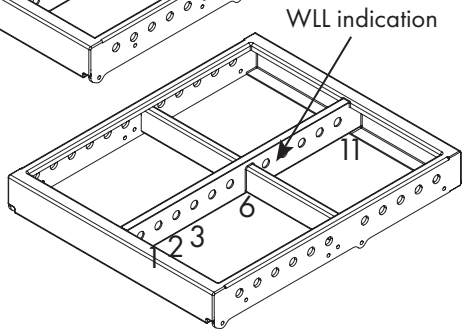
— Figure 5 —

1. Exterior plywood enclosure
2. Weatherized steel grille
3. Slip-resistant feet
4. Rear panel input cup and Working Load Limit (WLL) indication
5. Integrated Rigging System

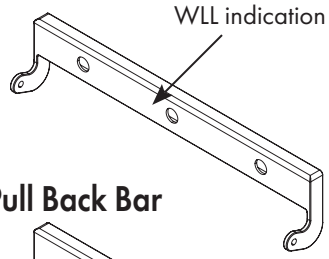
PL-LA8-AF Array Frame



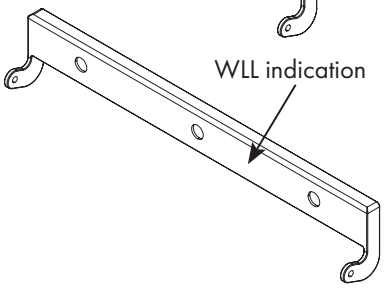
PL-LA12-AF Array Frame



PL-LA8-PB Pull Back Bar



PL-LA12-PB Pull Back Bar



*Number callouts are pick-point locations.

Rigging Safety Precaution

General Rules for Suspension

- Consult a professional mechanical or structural engineer, licensed in the jurisdiction of the sound system installation, to review, verify, and approve all attachments to the building or structure.
- Employ the services of a certified, professional rigger for hoisting, positioning, and attaching the equipment to the supporting structure.
- Correct use of all suspension hardware and components is imperative in sound system suspension and deployment.
- Always calculate suspended loads before lifting to ensure suspension components and hardware are used within their respective load limits.
- Consult local codes and regulations to fully understand the requirements for suspended loads in the venue in which equipment will be suspended.
- Use only dedicated PL-LA Series rigging hardware as described in this manual for suspending a loudspeaker array. Further details can be found below.
- Be absolutely certain of the integrity of any structural member intended to support suspended loads. Hidden structural members can have hidden structural weakness.
- Never assume anything! Owner or third-party supplied suspension attachment points may not be adequate for suspending the loads.
- Before lifting, always inspect all components (enclosures, suspension brackets, pins, frames, bolts, nuts, slings, shackles, etc.) for cracks, wear, deformation, and corrosion. Also inspect for missing, loose, or damaged parts that could reduce the strength of the assembly. Discard any worn, defective, or suspect parts and replace them with new, appropriately load-rated parts.

Shock Loading

When a load is moved or stopped, its static weight is magnified. Sudden movements can magnify the static weight several times. This is called "shock loading."

The effects of shock loading can be instantaneous, or can remain undetected. Proper preparation for shock loading requires careful planning and knowledge of equipment, suspension, and lifting practices. Shock loading is most often the result of lifting and installation, but natural forces (winds, earthquakes, etc.) can create shock loads several times the static load.

Shock loading poses a danger to equipment and workers. Because of this, structures and suspension equipment must be capable of supporting several times the weight of the suspended equipment.

Rigging Categories

Certification of the PL-LA Series rigging system has been analyzed by an independent structural engineering firm to certify some worst-case configurations. The Categories covered by the certification include the following Array deployments:

- Array Frame, Loudspeaker without Pullback Bar
- Array Frame, Loudspeaker with Pullback Bar
- Array Frame, Subwoofer, and Loudspeaker without Pullback Bar
- Array Frame and Subwoofers only
- Loudspeaker array with two Pullback Bars

The following gives the conditions in which every configuration has been tested within those categories.

- **Tilt angle or Frame angle** refers to the angle of the array.
- **Splay Angle** refers to the angle between two adjacent loudspeakers.
- **Total Splay Angle** refers to the sum of all the angles between the loudspeakers.
- **FOS** refers to the Factor of Safety.

Array Restrictions

1. The splay angle for each loudspeaker must always be equal to or greater than the splay angle of the loudspeaker directly above.
2. The Total Splay angle in an array should never exceed 62.5° for PL-LA8 and 70° for PL-LA12.
3. WLLs are based on simply-suspended arrays using the available Array Frame pick points to angle or aim the array up or down. Notwithstanding the use of a Pullback Bar, any method or means used to angle the array up or down beyond these simply-suspended angles may reduce the FOS.
4. All Loudspeaker rigging Certified only for Q-SYS array frames and Pullback Bar. Assembling with another structure is out of scope.

FOS changes according to the Total Splay Angle and Frame Angle. The following tables have been computed with the mentioned parameters. If the tilt or Total Splay of your particular array is above those parameters, the Factor of Safety rating will be impacted.

> **WARNING!:** Do not substitute the Shoulder Bolts included with the Loudspeakers; replace them only with the Q-SYS part SC-000777-01 or equivalent (see page 6).

Maximum Suspended Load

The following table provides Working Load Limits (WLL) at varying Safety Factors (7:1 or 10:1) for the PL-LA8 and PL-LA12 line array loudspeakers, PL-SUB18 subwoofer and companion rigging accessories.

The data presented below is based upon the listed component weights. The tabulated Working Load Limits represent static loads only. Dynamic and shock-load conditions are determined by unknown, installation-specific factors. The choice of which Safety Factor to follow will depend upon the jurisdiction, venue of installation, and conditions of suspension. Refer to a Licensed Structural Engineer for clarification before proceeding with suspension.

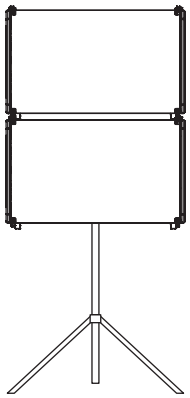
Working Load Limits (WLL)				
Model	**Individual Component Weight**	**7:1 Safety Factor**	**10:1 Safety Factor**	**Notes**
PL-LA8-AF	13.6 kg / 30 lbs			
+ PL-LA8 Array	12.4 kg / 27.3 lbs	**15 PL-LA8** 217.7 kg / 480 lbs	**12 PL-LA8** 169.2 kg / 373 lbs	Max Total Splay angle of 62.5°.
PL-LA8-PB Pullback Bar	1.6 kg / 3.4 lbs	173.7 kg / 383 lbs	121.6 kg / 268 lbs	15 PL-LA8. See page 26 for restrictions.
PL-LA8 M10 Pullback Point	Built into rear of product	92.1 kg / 203 lbs	64.4 kg / 142 lbs	
PL-LA12-AF	14.5 kg / 32 lbs			
+ PL-LA12 Array	19.5 kg / 43 lbs	**14 PL-LA12** 300.3 kg / 662 lbs	**10 PL-LA12** 214.1 kg / 472 lbs	Max Total Splay Angle of 70°
+ PL-SUB18 Column	46.3 kg / 102 lbs	**10 PL-SUB18** 477.2 kg / 1052 lbs	**8 PL-SUB18** 384.6 kg / 848 lbs	Max Tilt Angle +/- 5°
+ PL-SUB18 + PL-LA12		**3 PL-SUB18 + 11 PL-LA12** 377.8 kg / 833 lbs	**3 PL-SUB18 + 7 PL-LA12** 296.2 kg / 653 lbs	Max Tilt Angle +/- 5° Max 1 SUB rear facing
PL-LA12-PB Pullback Bar	2.1 kg / 4.6 lbs	161.9 kg / 357 lbs	113.4 kg / 250 lbs	12 PL-LA12. See page 26 for restrictions.
PL-LA12 M10 Pullback Point	Built into rear of product	80.3 kg / 177 lbs	56.2 kg / 124 lbs	
Double Pullback Bar Deployment		8 PL-LA8 or PL-LA12		See page 27.
LA-KIT-I (1)		4 PL-LA8 / 3 PL-LA12		

1. Included bridled angle to be 90° or less.

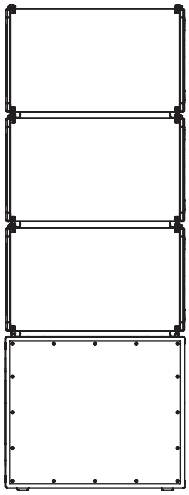
PL-LA8 and PL-LA12 Deployment Options

Scan here for additional rigging information.

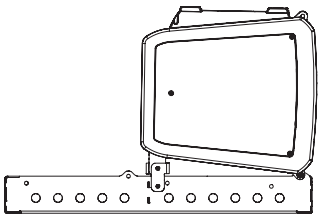
Ground Deployment (PL-LA12 options shown)



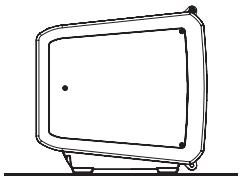
For **Pole Mounted on a Tripod Stand** see page 15.



For **Stacked on a PL-SUB18** see page 16.

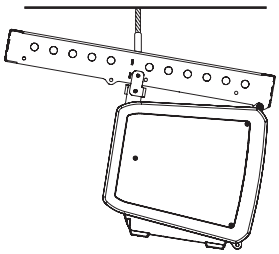


For **Stacked on an Array Frame** see page 19.

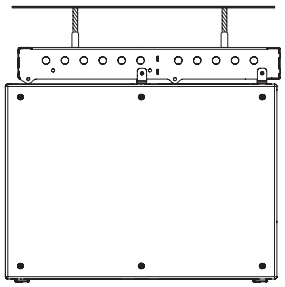


For **Front Fill (Stage-Lip)** see page 19.

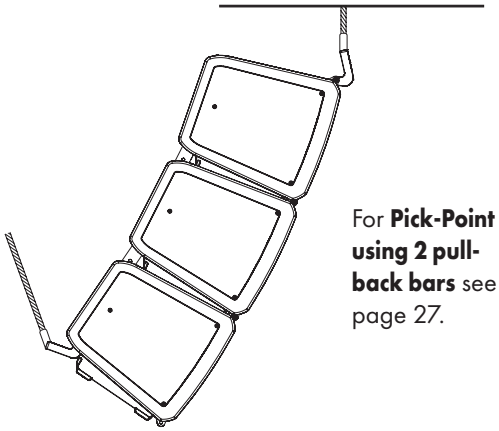
Flown Deployment (PL-LA12 options shown)



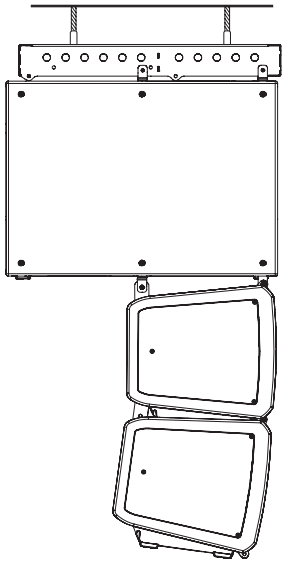
For **Attaching PL-LA to PL-LA** see page 22.



For **Flown Deployment with an Array Frame** see page 23.



For **Pick-Point using 2 pull-back bars** see page 27.



For **Attaching a PL-LA12 under a PL-SUB18** see page 24.

Ground Deployment

Pole Mounted on a Tripod Stand

Both PL-LA8/PL-LA12 line array loudspeakers feature dual 35 mm pole sockets to accommodate either 0° or -7.5° downward tilt of the enclosure to optimize audience coverage wherever deployed.

WARNING!: Due to the large selection of various types of tripod stands available in the market, Q-SYS cannot recommend a maximum deployment height. Assessment of the safety of each individual deployment is left to the user. However, any tripod stands used must be properly rated for the deployment.

WARNING!: When deploying loudspeakers on poles, additional attention should be given to account for environmental conditions such as level surfaces, level materials, vibrations, wind, etc, to deploy the loudspeakers in a stable and safe manner. Use additional measures to secure the loudspeaker pole (not included) when necessary.

PL-LA8 Loudspeaker

Up to three (3) PL-LA8 loudspeakers may be mounted on a 45 kg (100 lb.) rated tripod loudspeaker stand.

PL-LA12 Loudspeaker

Up to two (2) PL-LA12 loudspeakers may be mounted on a 45 kg (100 lb.) rated tripod loudspeaker stand.

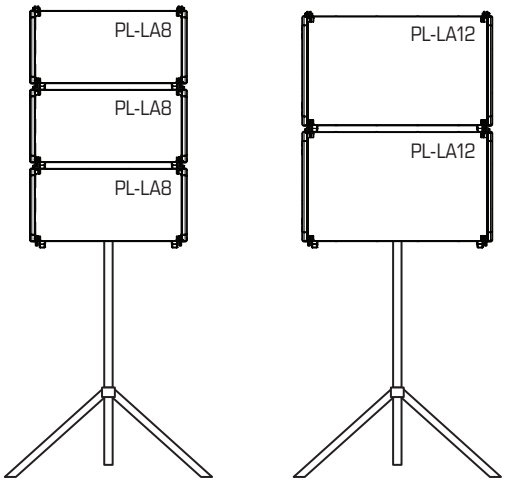


Figure 6

Pole Mounting a Loudspeaker on a Tripod Stand

To deploy a pole mount with a tilt of 0° or -7.5°, mount the loudspeaker on a 45 kg (100 lb.) rated tripod loudspeaker stand using the 35 mm pole socket labeled 0° or -7.5° on the bottom of the loudspeaker.

All angles between the boxes must be set before installing the loudspeaker on the tripod and cannot be changed while resting on the tripod.

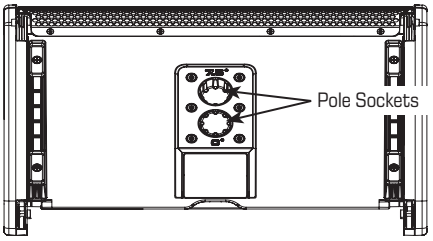


Figure 7

Stacking over a PL-SUB18

PL-LA12 passive line array loudspeakers offer the ability to safely stack an array over a PL-SUB18 subwoofer(s) unit or the cardioid deployment of two (or more) PL-SUB18 stacked, one facing forward the other facing backward with the correct Q-SYS setting.

WARNING!: When deploying loudspeakers on subwoofers, additional attention should be given to account for environmental conditions such as level surfaces, vibrations, wind, etc. to deploy the loudspeakers in a stable and safe manner. Use additional measures to secure the subwoofer (not included) when necessary.

PL-LA12 Loudspeaker

An array of up to three (3) PL-LA12 loudspeakers can be stacked over one (1) or two (2) PL-SUB18.

Stacking more than three (3) PL-LA12 loudspeakers is feasible but will require the PL-SUB18 to be secured on the ground to avoid instability.

The PL-LA12 will fasten to the subwoofer by placing the 2 links in the holes on each side of the subwoofer and securing with bolts (See "Stacking two PL-SUB18" on page 17).

NOTE: For this ground-stack deployment, the PL-LA12-AF (Array Frame) accessory is **NOT** needed.

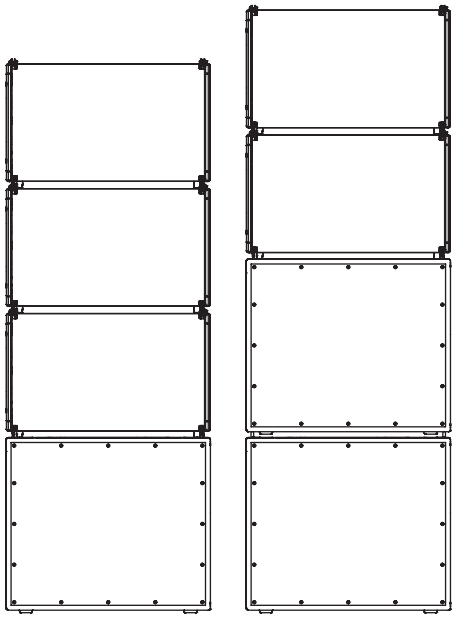
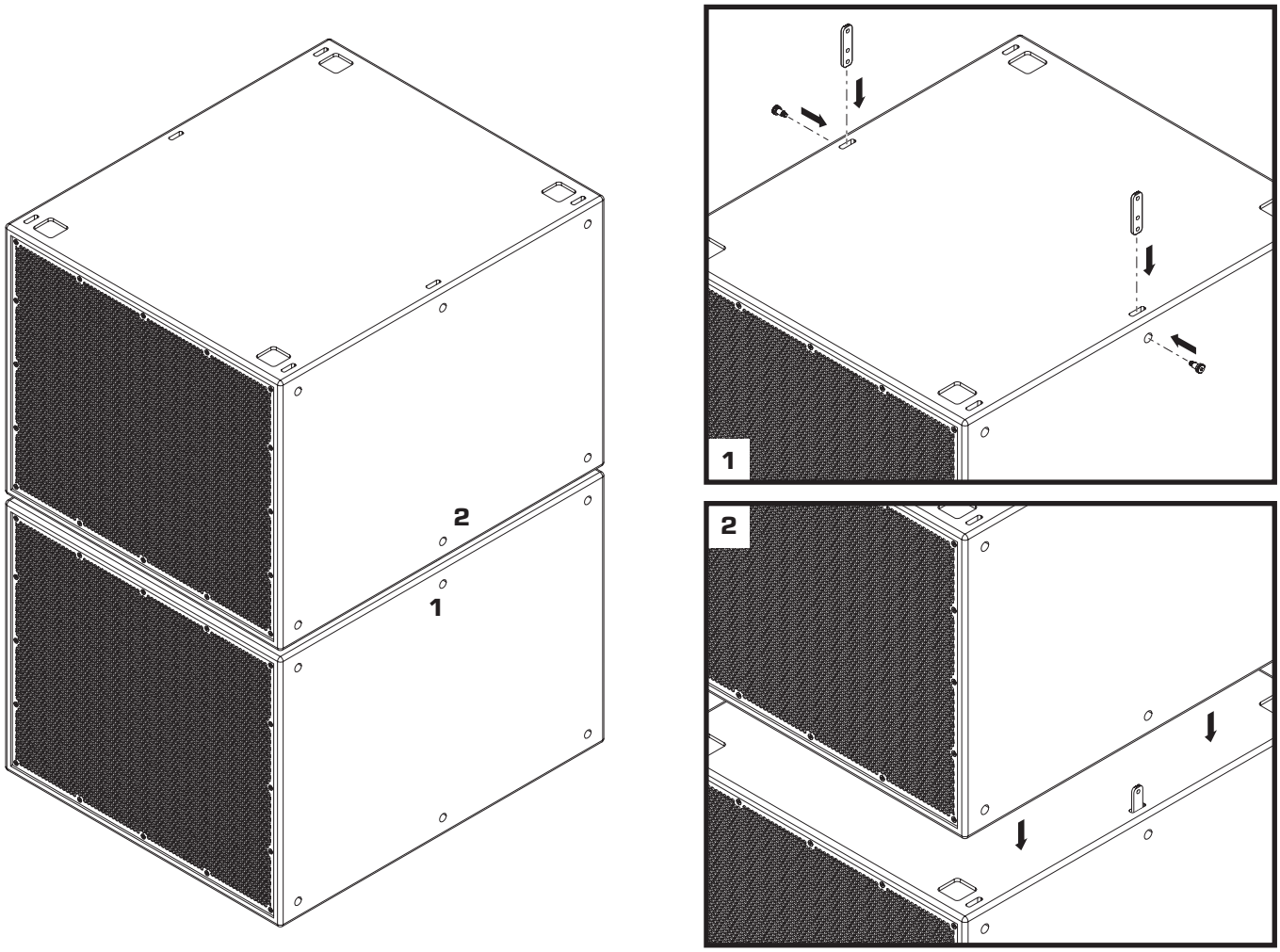


Figure 8

Stacking two PL-SUB18

1. Attach two Straight Links to the middle slots of the PL-SUB18 (do not torque yet).
2. Place the second PL-SUB18 on top of the first PL-SUB18.
3. Torque to 11.3 N·m (100 lbf·in) with the bolts provided.

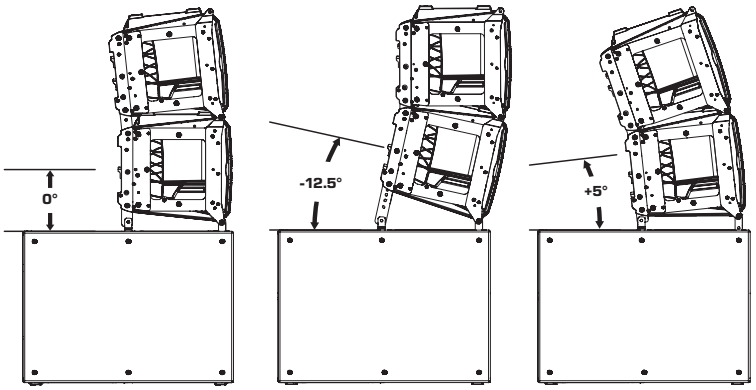


— Figure 9 —

Stacking a PL-LA12 to a PL-SUB18

It is possible to stack a PL-LA12 on a PL-SUB18 directly without the use of an Array Frame. Angles that are achievable on the first box will be between +5° up-tilt to -12.5° down-tilt according to the position of the Straight Link at the front and the slider at the back.

NOTE: The GLL used for simulation in EASE or EASE Focus from AFMG will only allow the standard configuration, which is [0 / -12.5°].



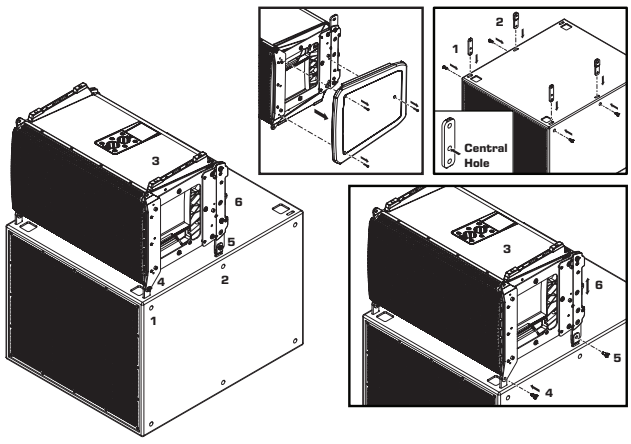
— Figure 10 —

NOTE: Remove the side panels from each side of the PL-LA loudspeaker.

1. Attach two Straight Links to the front slots of the PL-SUB18 loudspeaker. Use the central hole of the link as shown in Figure 11. With the link in this position, the FLY setting will result in a 0°angle. On the 0.5°, the down-tilt angle will be -12.5°.

   NOTE: Using the two extreme holes of the link will result in a shift of 5° up : up-tilt of +5° on the FLY position, 0° when in the 8° position and down-tilt of -7.5° on the 0.5°position.

2. Attach two Y-Links to the middle slots of the PL-SUB18 subwoofer. The nuts should be located inside the PL-LA12 loudspeaker.
3. Place PL-LA12 loudspeaker upside down on top of the PL-SUB18 subwoofer.
4. Bolt the front attachment point of the PL-LA12 loudspeaker (do not torque yet) to the PL-SUB18 subwoofer.
5. Bolt the back attachment point of the PL-LA12 loudspeaker (do not torque yet) to the PL-SUB18 subwoofer.
6. Adjust the angle using the slide bar (remove the blocking screw, adjust the slider, put back the blocking screw on the nut labeled with the desired angle value).
7. Torque to 11.3 N·m (100 lbf·in) with the bolts provided.
8. Attach the side panel.



— Figure 11 —

Stacking a PL-LA on a Array Frame

The ground stacking of the PL-LA is similar to the flying of the PL-LA under a frame, but upside down.

Due to its limited footprint, the stacked array could be unstable depending on the number of PL-LA loudspeakers that are being deployed and the total splay of the assembly. Ensure the stability and fasten the frame to the ground if there is any doubt of safety. If the frame is not attached to the ground, a maximum of 4 PL-LA8 and 3 PL-LA12 can be deployed.

1. Lay the Array Frame on the ground with the mounting point facing upward.
2. Build the array upside down following the instruction of "Flown Deployment" on page 20.

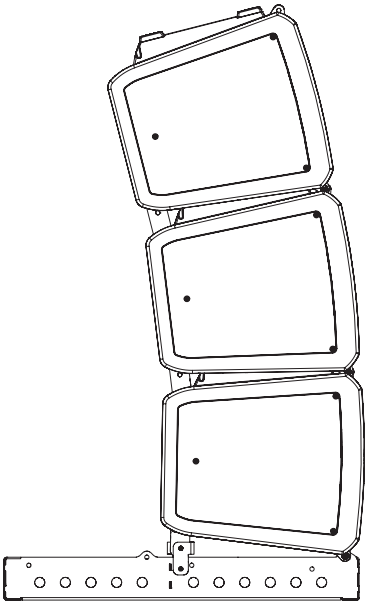


Figure 12

Front Fill (Stage-Lip)

When used as a stand-alone loudspeaker, the integrated lower feet of the PL-LA8/PL-LA12 line array loudspeakers ensure that the enclosure remains exactly perpendicular to the stage floor, making it ideal for front-fill or stage-lip deployments.

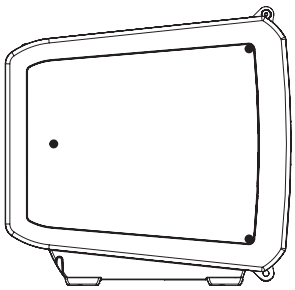


Figure 13

Single Loudspeaker Deployment

Use the LA-KIT-I to integrate up to three PL-LA12 or four PL-LA8 without using the array frame.

1. Assemble the array of loudspeakers on the ground using the included mating hardware, as described page 22
2. Attach two Shackle Adapters to the Front Strikes on the left and right side of the loudspeaker.
3. Install one Shackle Adapter facing forward and one Shackle Adapter facing backward.
4. Attach the Eyebolt: Screw the M10 Pullback Bar Eyebolt into the threaded insert located on the back of the lowest loudspeaker of the array. This is a third pick-point that further supports the system.

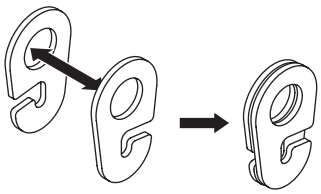
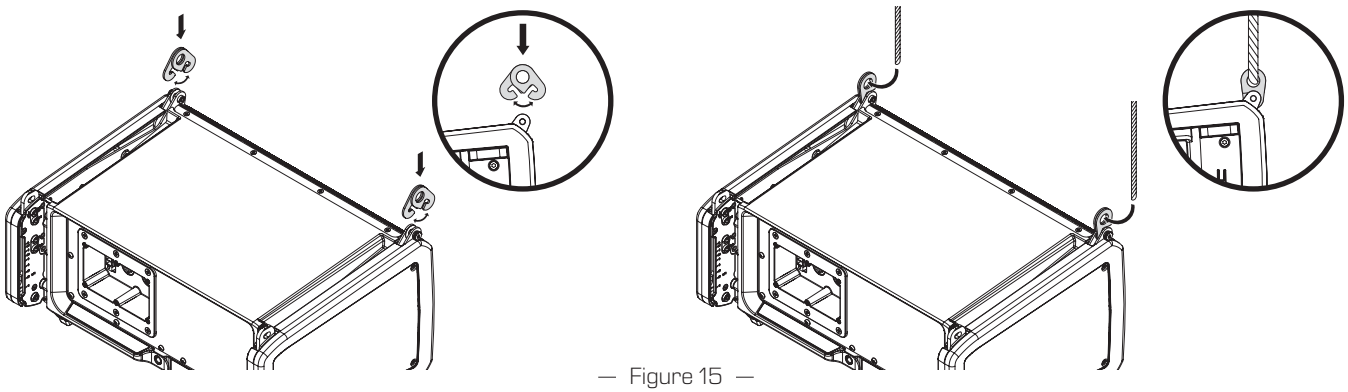


Figure 14



— Figure 15 —

Flown Deployment

CAUTION!: When transporting the loudspeakers, return the Angle Bar to the retracted position (P setting).

NOTE: Different kinds of PL-LA loudspeakers cannot be mixed together!

The PL-LA rigging system uses self-clinching captive locknuts that prevent loosening without having to use Loctite or other single-use nylon nuts. Locknuts are free running until clamp load is induced. A modified angle on the loaded flank provides the vibration-resistant locking feature. Locking feature reusability is not affected by the number of uses.

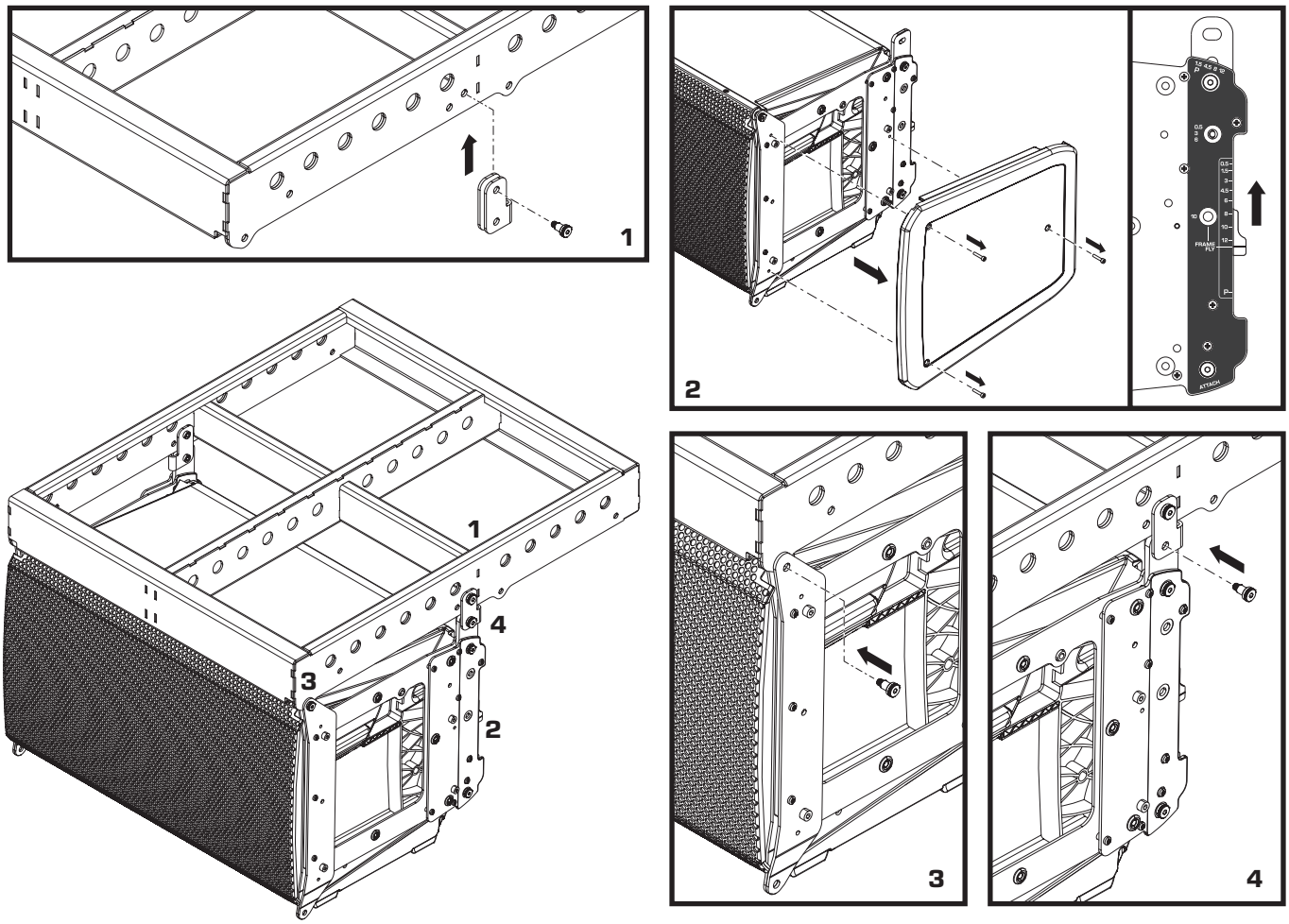
WARNING!: Always use the Q-SYS SC-000777-01 M6 shoulder screws provided with the rigging system.

Attaching PL-LA to the Array Frame PL-AF Down Tilt

1. Attach two Rear Links to the Array Frame.

   NOTE: The side of the Rear Link with the nut will always be placed to the inside of the array.

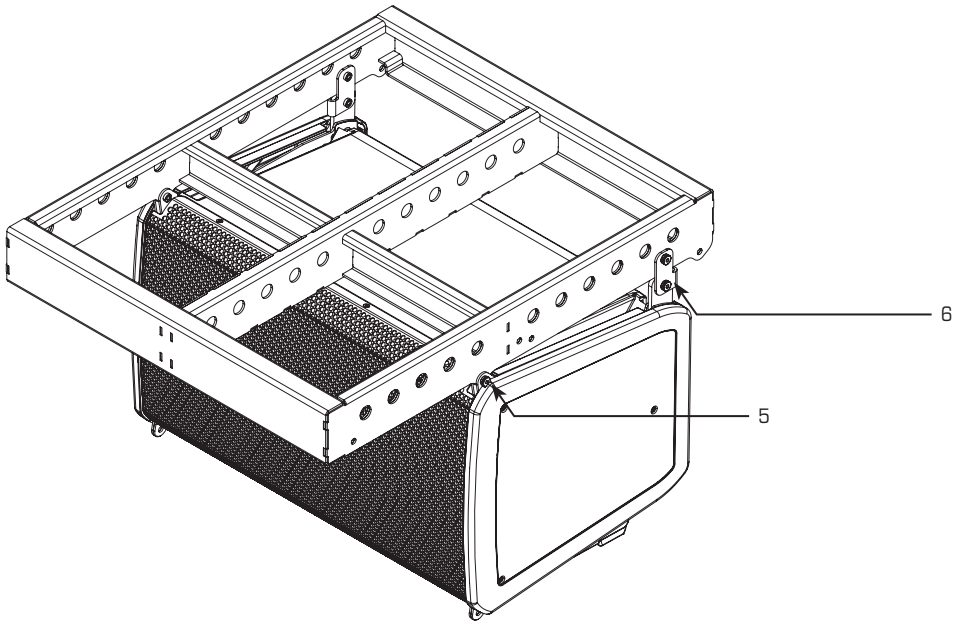
2. Remove the side panels from each side of the loudspeaker and put the angle slider in position FLY.
3. Attach the front of the loudspeaker to the Array Frame.
4. Attach the angle slider to Rear Link.
5. Torque everything to 11.3 N·m (100 lbf·in).



— Figure 16 —

Attaching PL-LA to Array Frame Up Tilt

If the gravity center of the array prevents you from performing up-tilt of the frame, you can reverse the Array Frame and attach the front of the Loudspeaker at the point labeled 5 in Figure 17 and the Rear link at the point labeled 6 in Figure 17. In this configuration, the frame will protrude at the front of the loudspeaker and provide a better up-tilt.



— Figure 17 —

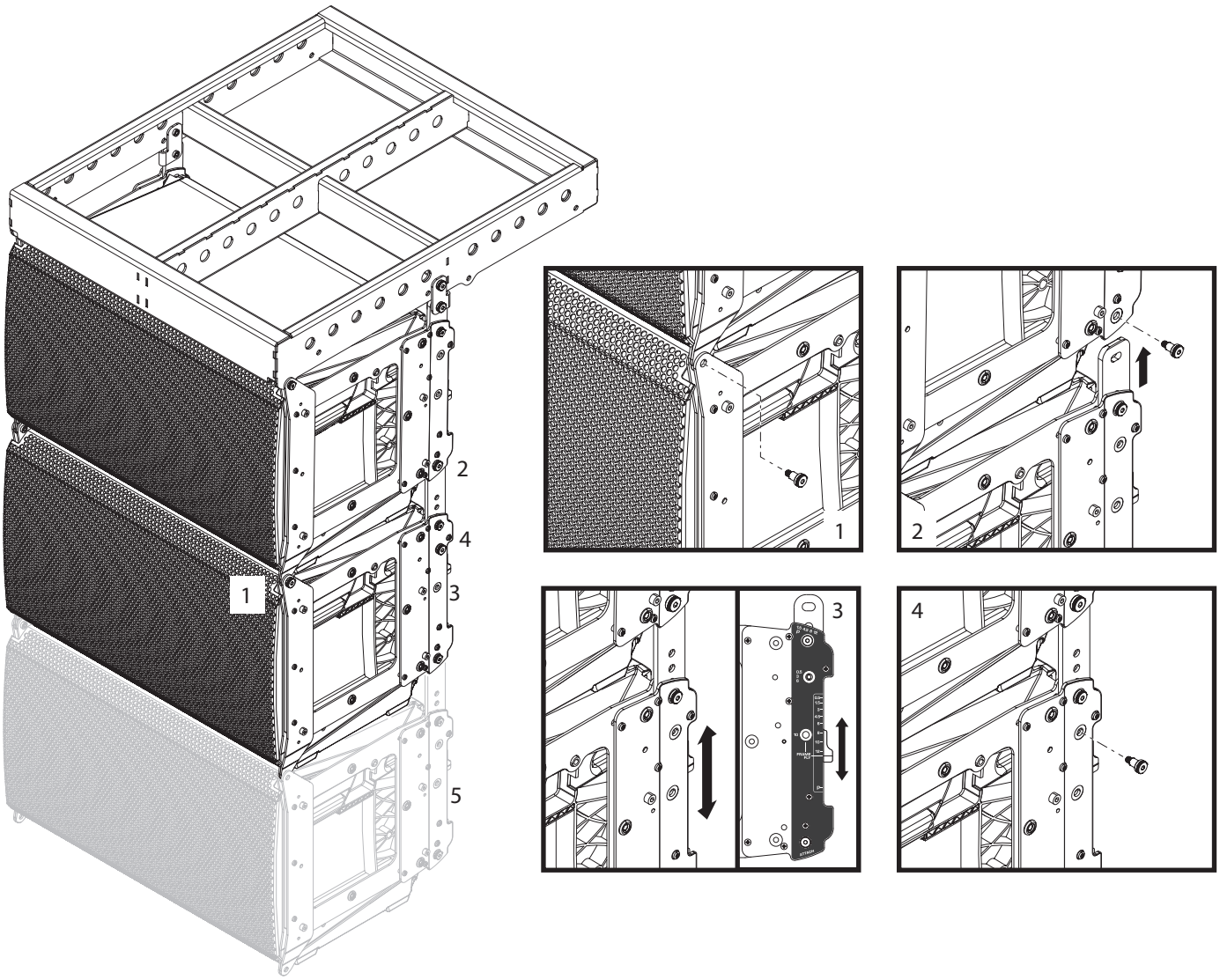
Attaching PL-LA to PL-LA

Do not fully torque the screws before the array is mounted and angled, as it will prevent the free rotation needed so gravity can set the angle as needed.

> **NOTE:** Remove the side panels from each side of all of the PL-LA loudspeakers before starting the assembly of the PL-LA loudspeakers.

1. Attach the front of the PL-LA to the next PL-LA loudspeaker.
2. Select the desired angle.
3. Attach slider at the back (ATTACH point).
4. Insert a screw into the corresponding locking hole.
5. Repeat with the next PL-LA loudspeaker.
6. Torque each screw at 11.3 N·m (100 lbf·in) when all the PL-LA loudspeakers are installed and properly angled.

> **NOTE:** For large arrays, it may be convenient to assemble 2-3 PL-LA loudspeakers on the ground before attaching them to the array.



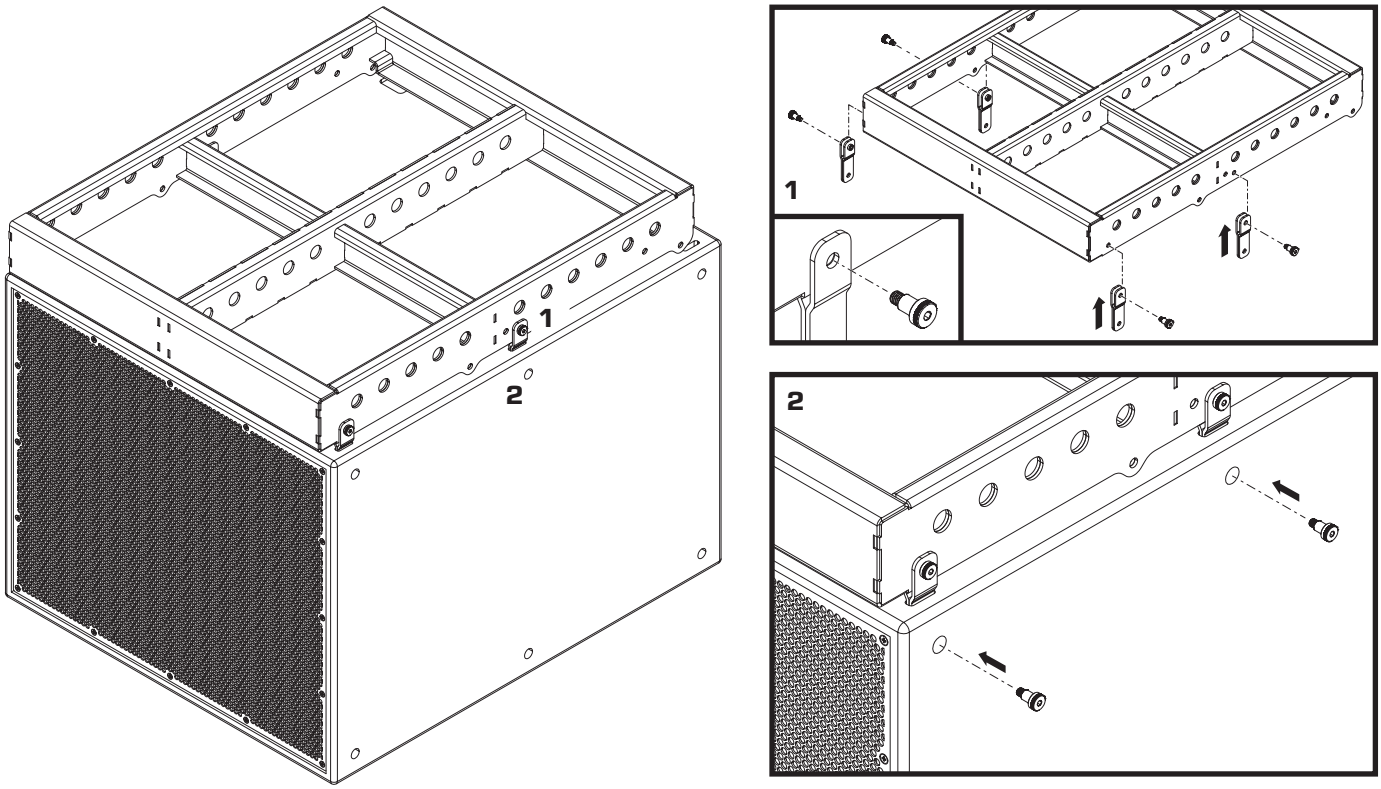
— Figure 18 —

Attaching a PL-SUB18 to the PL-LA12-AF Array Frame

1. Attach the inter-connect Y-Links on the array frame. Two links at the front and two links in the middle.

   NOTE: The nut side of the Y-Link will always be placed to the inside of the array.

2. Insert the links into the PL-SUB18.
3. Tighten the bolts to secure. Torque to 11.3 N·m (100 lbf·in).



— Figure 19 —

Attaching a PL-LA12 under a PL-SUB18

NOTE: Remove all side panels from the PL-LA loudspeakers before deploying the array. Side panels have only a cosmetic function and are not needed to ensure a safe deployment.

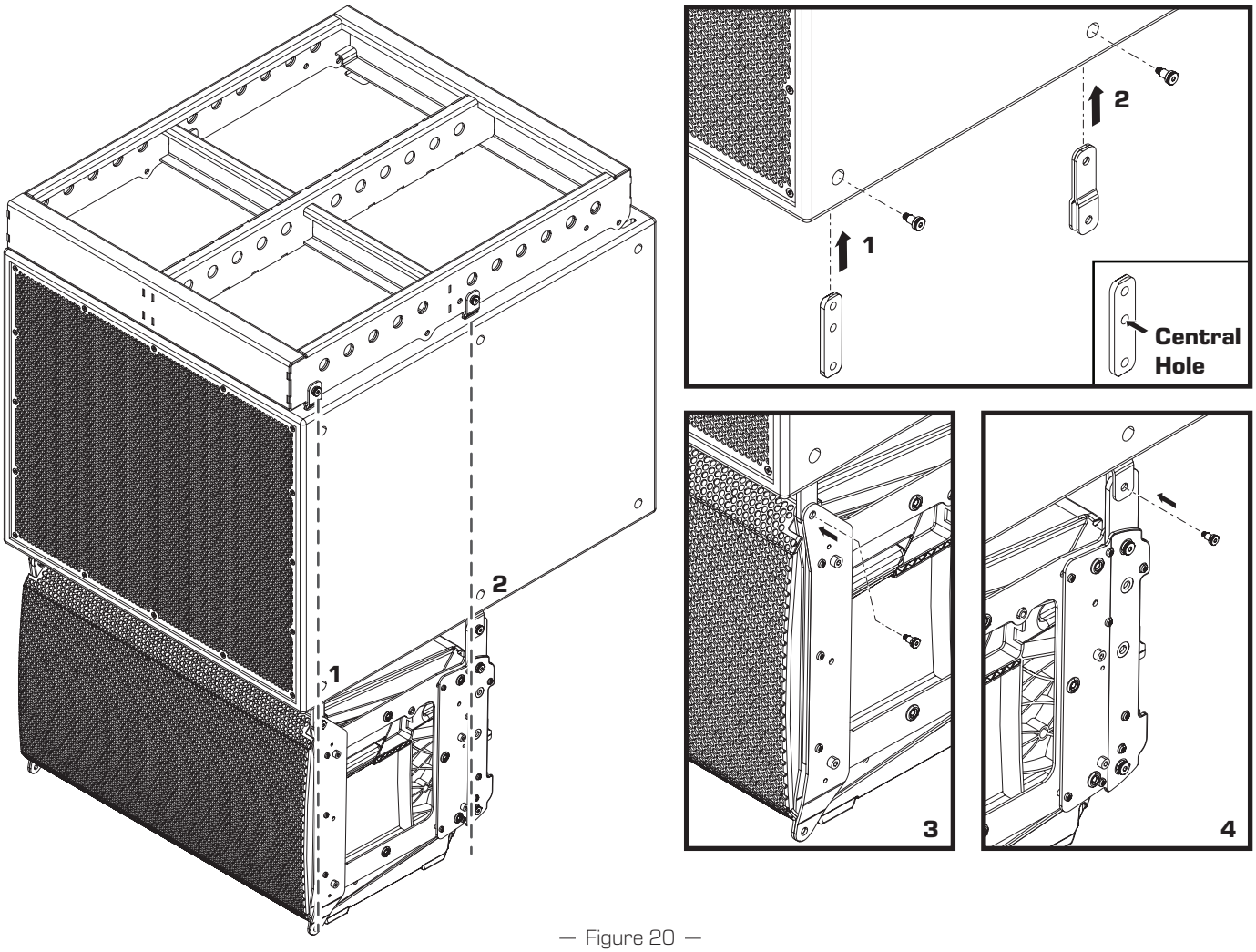
1. Attach two Straight Links on the front of the PL-SUB18. Use the **central hole** of the link as shown.
2. Attach two Y-Links on the middle of the PL-SUB18.

   NOTE: The nut side of the Y-Link will always be placed to the inside.
3. Attach the front of the loudspeaker to the Straight Link (labeled 1 in Figure 17).
4. Attach the back of the loudspeaker (slider bar in position FLY) to the Y-Link.

   NOTE: PL-LA8 cannot be attached under PL-SUB18.

   NOTE: To add additional PL-LA loudspeakers, see "Attaching PL-LA to Array Frame Up Tilt" on page 21.

   NOTE: Metallic continuity is ensured from the array frame to the PL-LA12 loudspeaker thanks to a strut located inside the PL-SUB18 Subwoofer. See dotted line on Figure 20.

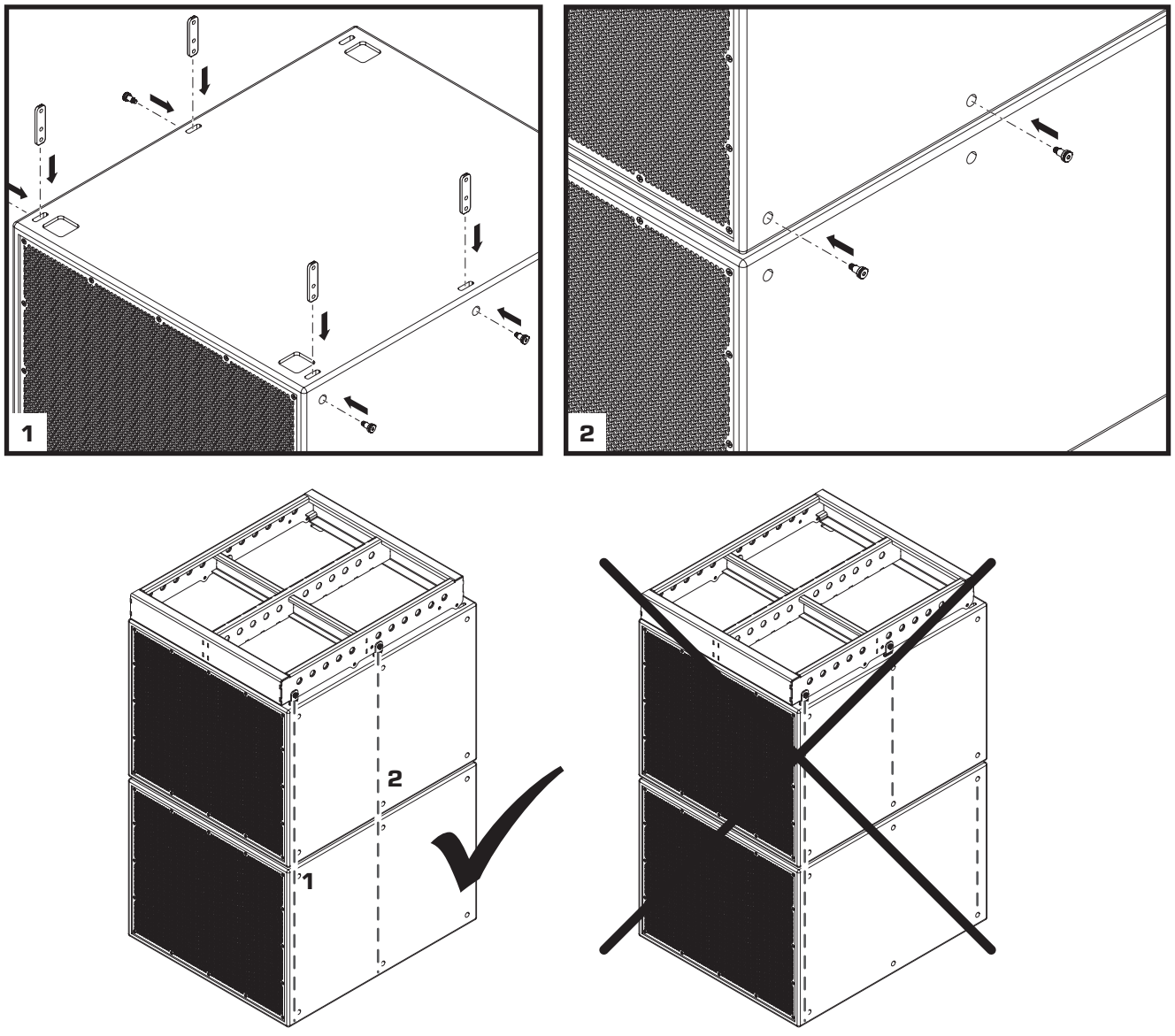


— Figure 20 —

Attaching a PL-SUB18 under a PL-SUB18

1. Insert the inter-connect Straight Links into the PL-SUB18, always two at the front and two in the middle. Ensure that the Straight Links are always aligned with frame attachment.
2. Attach the link from the top of the bottom PL-SUB18 into the base of the top PL-SUB18.
3. Torque the four bolts to 11.3 N·m (100 lbf·in) to ensure that the bottom PL-SUB18 is correctly fastened to the top PL-SUB18.

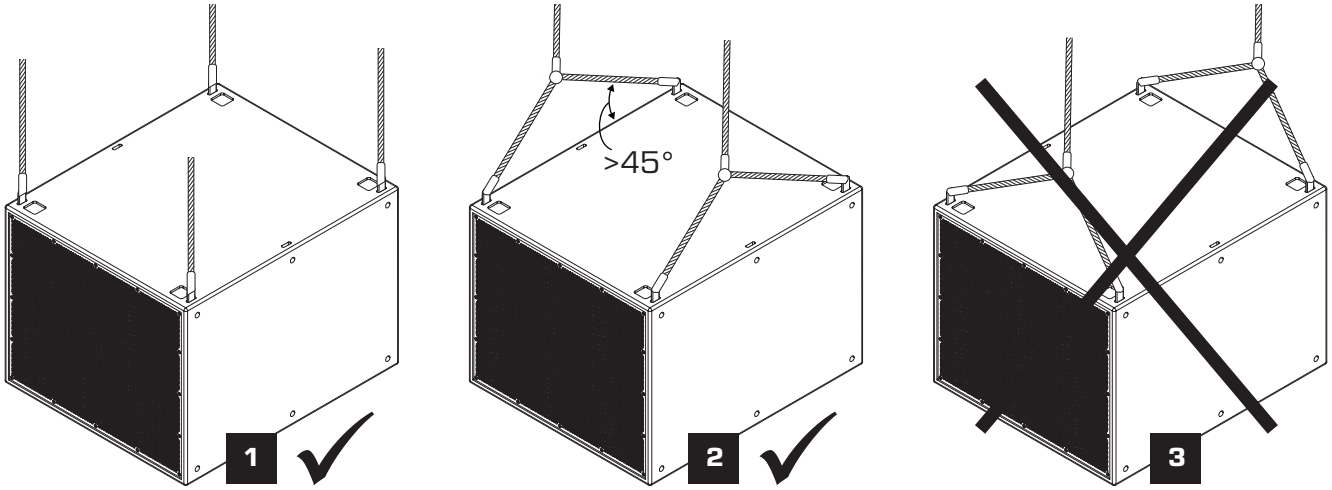
NOTE: Metallic continuity is ensured from the array frame to the PL-LA12 loudspeaker thanks to a strut located inside the PL-SUB18 Subwoofer. (see dotted line on Figure 21)



— Figure 21 —

Flying a single PL-SUB18 without Array Frame

1. Attach four 1/4 in. shackles with an 8 mm pin shaft to the Straight Links in a straight position.
2. Attach bridles to the sides of the subwoofer so that the top angle is greater than 45°.
3. Do not attach bridles to the ends of the subwoofer.



— Figure 22 —

Attaching Pullback Bar to PL-LA

The Pullback Bar will be located at the back of the loudspeaker. This method is utilized when the Pullback Bar is used to achieve array angles that would not be possible by gravity alone.

Pullback Bar Deployment

The Pullback Bar can be used in two use cases:

1. When gravity alone does not allow reaching the desired down tilt angle, the Pullback Bar can be used on the rear of the lowest loudspeaker of the array to provide another pick-point for further support to angle the system.
2. A small number of boxes can use the Pullback Bar PL-LA-PB in lieu of the Array Frame. See "Suspending PL-LA Loudspeakers using Two Pull-Back Bars" on page 27.

WARNING!: The load angle with the vertical at the attachment point should be between 0° and 45° as shown in Figure 23.

WARNING!: Only use pick-point number 1 to 6 on the Array Frame. See page 11.

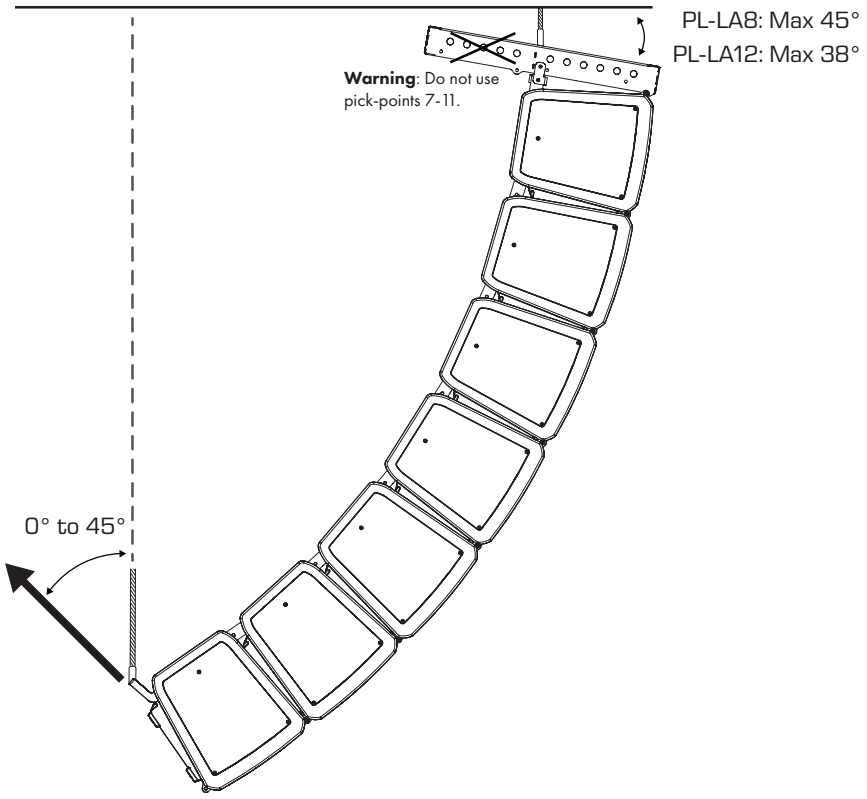
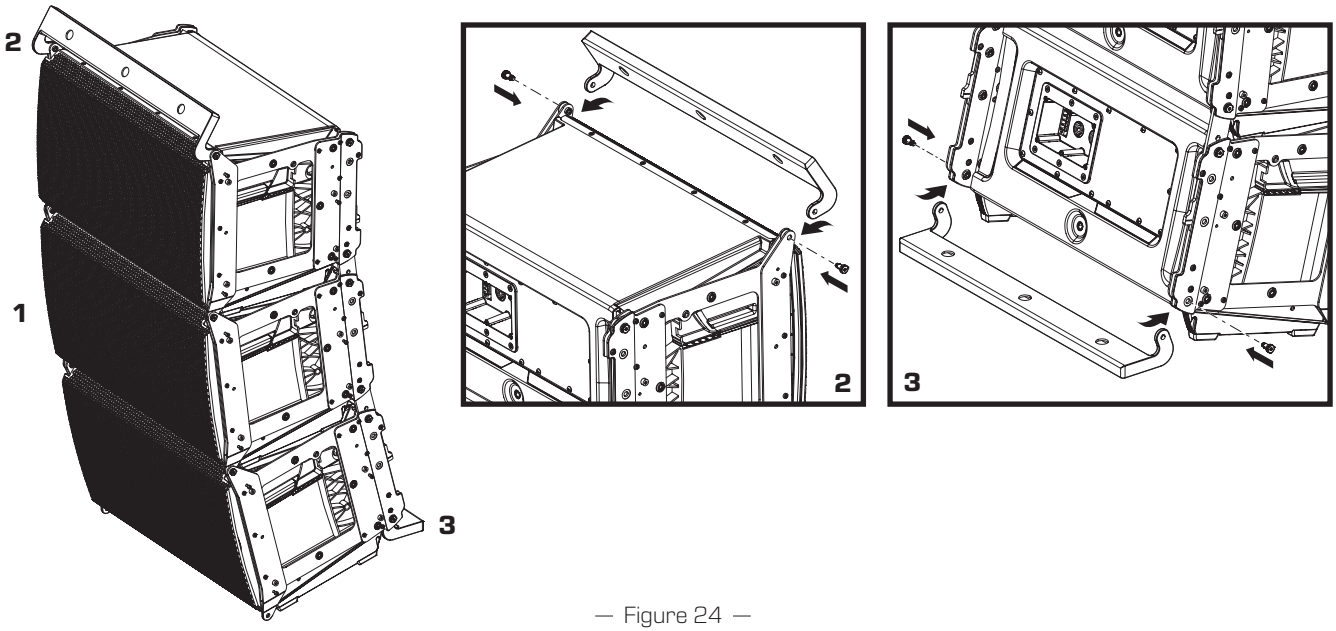


Figure 23

Suspending PL-LA Loudspeakers using Two Pull-Back Bars

1. Assemble the array of loudspeakers on the ground using the included mating hardware, as described on page 22.
2. Attach one pull back bar at the top front of the array.
3. Attach the second one to the back rear of the array.



— Figure 24 —

Optional Eyebolt

When a Pullback Point is needed, an M10 Eyebolt can be used on the rear of the lowest loudspeaker of small arrays to provide another pick-point for further support to angle the system.

WARNING!: Do not exceed the Working Load Limits of the M10 Pullback Bar Point as stated in "Maximum Suspended Load" on page 13.

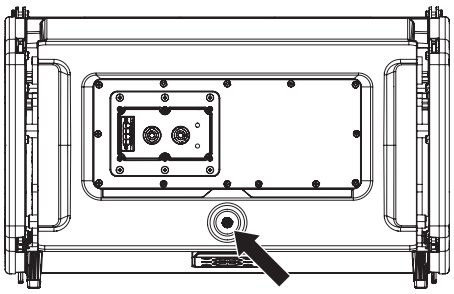
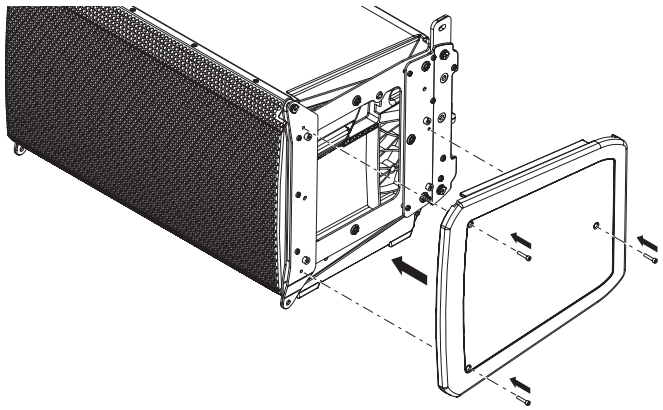


Figure 25

Side Panel

1. Once the rigging angles are definitive and secure, you will then need to install the side panel to hide the rigging hardware.
2. Insert the plate into the grommets on the top and the bottom and torque the 3 screws at 1.35 N·m (12 lbf·in).
3. Repeat on every loudspeaker.



— Figure 26 —

Splay Angle Adjustment

It is easier to set the angles when constructing the array. However, if some adjustments are needed, proceed as follows.

1. Loosen up all the screws to give the array freedom of movement.
2. Lift the rear of the array so the weight is not preventing you from changing the angle. For a small array, this can be done manually. For a heavier array, or when the array is deployed by a single person, you can use a ratchet strap between the array frame and the M10 Pullback Point of the last loudspeaker.
3. Change your angles to the new, desired angles (see "Attaching PL-LA to PL-LA" on page 22). Do not torque yet; they should be loose to allow for movement as you adjust the splay angle.
4. Release the array so that it hangs freely and remove the ratchet strap.
5. Torque everything at 11.3 N·m (100 lbf·in) until it is completely secure.
6. Put back the side panel (see above).

Pick-Point Deployment

Single Pick-Point Deployment

For single pick-point deployments, a 16 mm (5/8 in.) shackle (not included) can be attached to the center rail of the Array Frame at the center-of-gravity (CG) point for the desired angle.

NOTE: Use EASE Focus 3 (available online) to locate the CG point and desired angle for specific deployments.

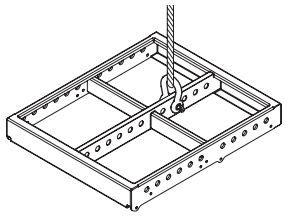


Figure 27

Dual Pick-Point Deployment

For a dual pick-point deployment with two pick-points, two 16 mm (5/8 in.) shackles (not included) can be attached to the center rail of the Array Frame.

NOTE: When using a Pullback Bar, limitations apply. See Figure 23 on page 26.

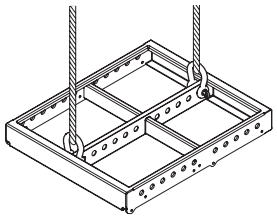


Figure 28

Bridle Deployment

For a bridle deployment with two pick-points, two 16 mm (5/8 in.) shackles (not included) can be attached to the two outer rails of the Array Frame at the CG point for the desired angle.

NOTE: Use EASE Focus 3 (available online) to locate the CG point and desired angle for specific deployments.

NOTE: When using a Pullback Bar, it is best to use the same pick point number on both sides. If the pick point numbers differ, the maximum allowable difference is 1.

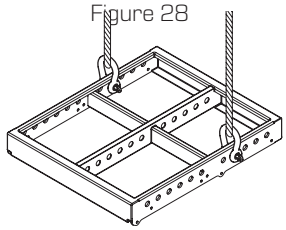
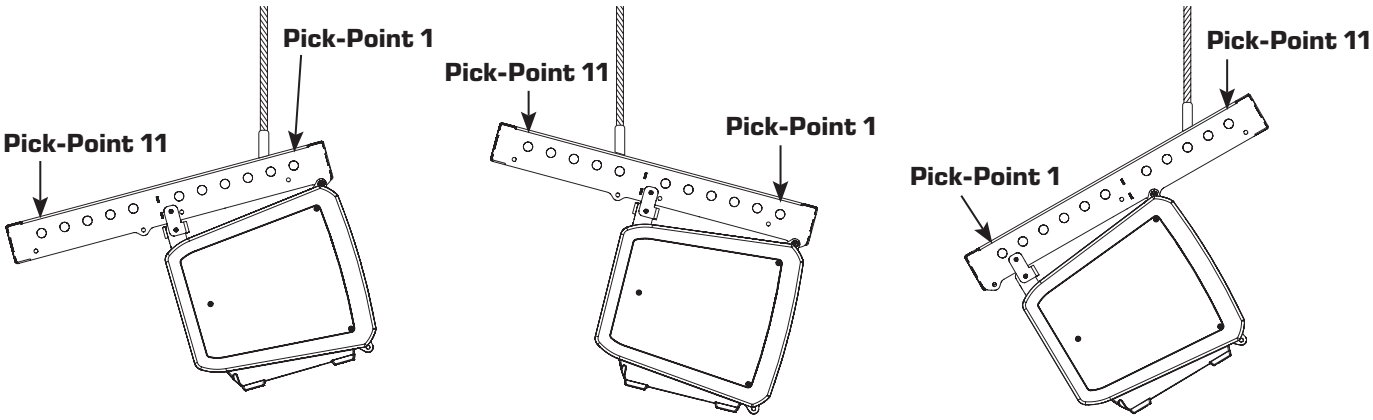


Figure 29

Adjusting the Tilt Angle of the Array on a Pick-Point Deployment

The tilt angle of the array can be adjusted for single pick-point and bridle deployments by moving the shackle(s) forward or backward on the Array Frame. A greater uptilt can be achieved by reversing the loudspeaker on the array frame or using the extension bar.



— Figure 30 —

WARNING!: Rigid mounting of the frame may affect the Factor of Safety. See "Array Restrictions" on page 13.

PL-SUB18 Cardioid Configuration

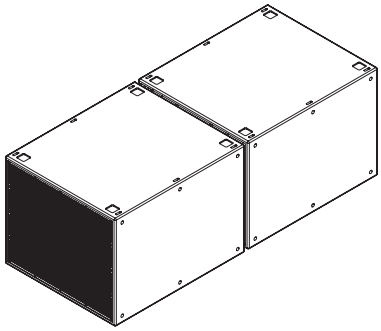
Two or more PL-SUB18 subwoofers can be arranged and configured to produce a cardioid radiation pattern. The processing necessary for cardioid operation is already programmed into each PL-SUB18 Q-SYS Designer Software Inventory block. For each subwoofer facing forward (toward the audience), select the OMNI property. For each subwoofer facing away from the audience, select the CARDIO property. Put the same audio signal into both subwoofers and set the same gain on each one. Refer to the Q-SYS online documentation.

There are three Cardioid configurations:

- Back-to-back
- Stacked (flown in the array or ground-stacked)
- Side by side

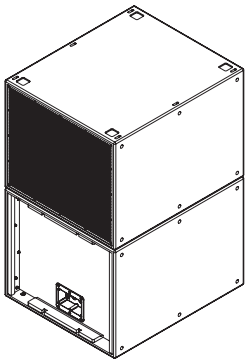
Back-to-Back

Placing the subwoofers back-to-back offers the best cardioid performance, with 15 dB of sound attenuation to the rear. Space between PL-SUB18 should be around 10cm.



Stacked

Place the rear-facing subwoofer on the bottom when ground-stacked, and on the top when flown. (See page 25 for assembling the SUB18 together).



Side by Side

Placing the PL-SUB18 subwoofers side-by-side may save space but creates a less precise cardioid pattern. Use the same Q-SYS settings as for Cardio-Stacked.

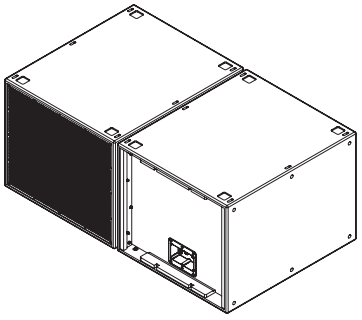


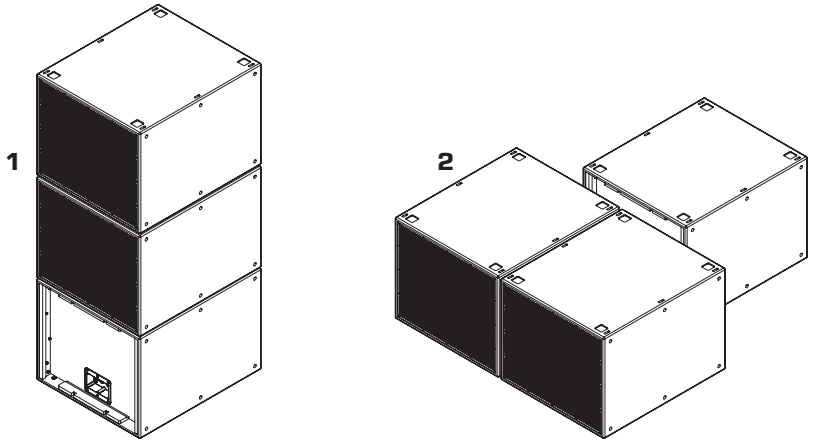
Figure 31

Three-Box Cardioid Systems

A three-box array, with two forward-facing subwoofers and one rear-facing subwoofer, gives additional acoustic output to the front.

Figure 32 (1) shows a stacked three-box array. Use the bottom subwoofer as the rear-facing one when ground stacking, and at the top when flown.

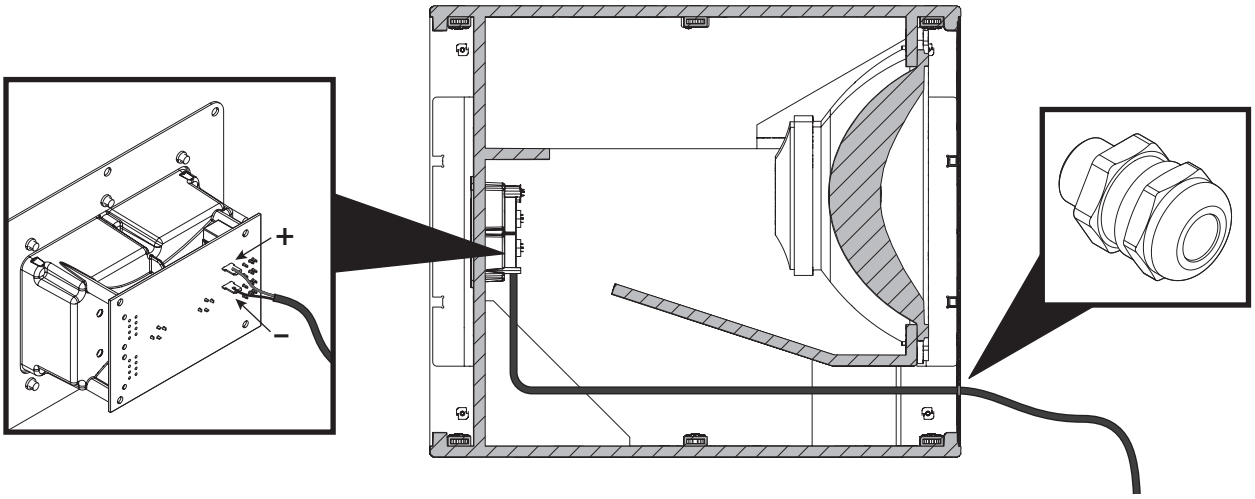
Figure 32 (2) shows a back-to-back three-box array.



— Figure 32 —

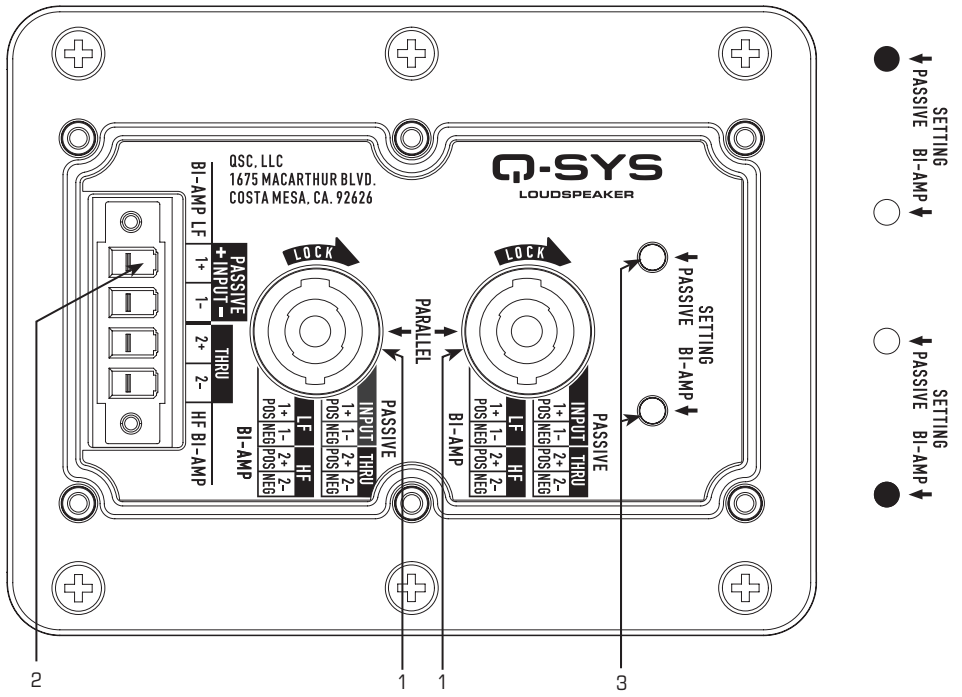
Cable Management and Fake Grille

For applications where cosmetic appeal is important, you can install another grille on the back of the rear facing PL-SUB18. In that case the Rear Panel Connection won't be accessible anymore and it will be necessary to route the Input cable thru the port to the input cup connector as shown below. A small opening will have to be made into the front grille to allow the cable to get into the PL-SUB18 loudspeaker. It is recommended to attach the cable on the inside wall of the port, and then securing it to one of the columns holding the PCB.



— Figure 33 —

Rear Panel Connections PL-LA8 and PL-LA12



— Figure 34 —

1. SpeakON Connector wired in parallel
2. Euroblock Connector
3. BI-AMP / PASSIVE indicator

Input Connectors

Two types of connectors can be used:

- The plugable "Eurostyle" input connector (Figure 34 callout 2) has four terminals to facilitate connection on a distributed line. It also allows the installer to pre-wire the venue before the loudspeakers themselves are installed. The connector accommodates wire up to 8 AWG/10 mm². Ensure proper and consistent polarity at each connector. Always secure the connector to the loudspeaker using the retaining screws at both ends.
- The speakON NL4 connector offers 4 poles and accommodates wire up to 10 AWG / 6 mm². Refer to Neutrik (TM) instructions for assembling.

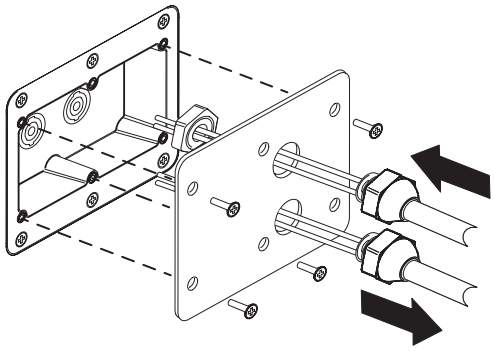
Euroblock Connector and speakON NL4 Connectors	
Passive Mode	**Bi-amp Mode**
INPUT 1+ and 1-	LF 1+ and 1-
THRU 2+ and 2-	HF 2+ and 2-

Installing the Optional Input Cover

Due to the variety of cable diameters, the "cable gland" (suitable for 22.5 mm diameter hole) must be sourced independently.

The loudspeaker comes with a weather cover for the input cup to protect the input connections and switches from precipitation and other weather hazards (Figure 1). Use the weather cover for all outdoor installations or any applications where the loudspeaker may be exposed to moisture. To ensure good seal in the cable gland, use outdoor-rated cable with a round jacket up to 0.37 in or 9.4 mm in diameter.

To use the weather cover:

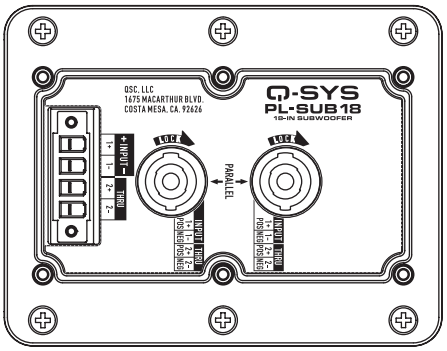


1. Loosen the nut on the cable gland.
2. Pass the cable all the way through the nut and the rest of the gland.
3. Attach the input connector to the wires (see Input Connector, below).
4. Once the loudspeaker enclosure is installed, plug the input connector into the loudspeaker's input cup. Secure the connector to the loudspeaker using the two captive retaining screws, one on each end.
5. Place the cover onto the loudspeaker's input cup and attach it using the four screws, lock washers, and flat washers provided.
6. Dress the cable so there is no undue strain on it. Tighten the gland nut until the grommet inside the gland has made a tight seal onto the cable jacket.

The optional input cover only accommodates the Eurobloc Connector, not the speakON NL4.

Rear Panel Connections PL-SUB18

System Amplification



The PL Series is meant to be used with CX-Q amplifiers (or future generations) with a preference for 4-channel models that have more DSP resources. Using an 8-channel amplifier will result in a loss of EQ precision between 300 and 800 Hz. The exact model will depend on your application, the number of loudspeakers per channel, and the type of loudspeaker.

The number in parenthesis means that it may work, but will probably not fully exploit the loudspeaker (i.e., avoid heavy musical content).

Bi-amp mode: all HF can be run on a CXQ 2K4 amplifier. **If you are using amplifiers of a different type on HF and LF, please remember that those will have different gains that will have to be compensated.** The LF section requires the same amplifier as the passive mode.

System Processing

Q-SYS PL Series are designed to be used with a Q-SYS Core processor only and CX-Q amplifiers. Refer to the documentation of Q-SYS Designer Software for a description of the settings.

Number of Loudspeakers per Amplifier Channel

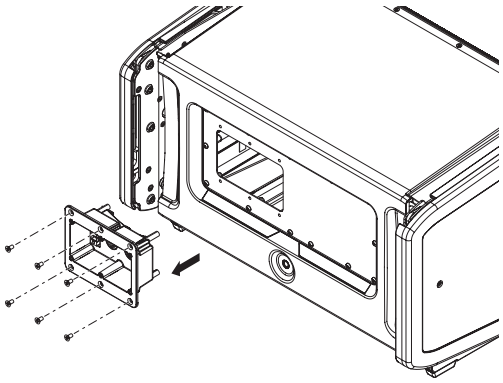
Loudspeaker	CXQ 2K4	CXQ 4K4	CXQ 8K4
PL-LA8 (Passive & LF Bi-Amp) PL-LA12 (Passive & LF Bi-Amp)	1	2	4
PL-LA8 Bi-Amp HF PL-LA12 Bi-Amp HF	4 2 (3)	6 (8) 3 (4)	8 4
PL-SUB18	-	(1)	1(2)
Gain (1.2 V Setting)	33 dB	35 dB	38 dB

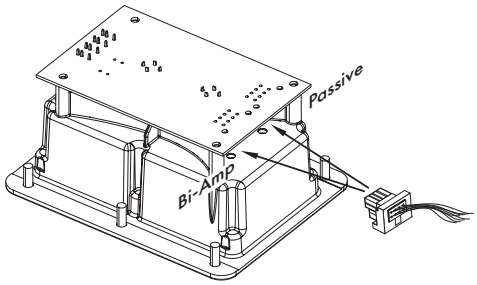
NOTE: The 8-channel amplifiers don't offer the same DSP resources as the 4-channel amplifiers. As a result, EQ precision between 300 and 800 Hz may be lost. The 8-channel amplifiers are not recommended for critical listening and for Bi amp mode.

Changing from Passive to Bi-Amp Mode

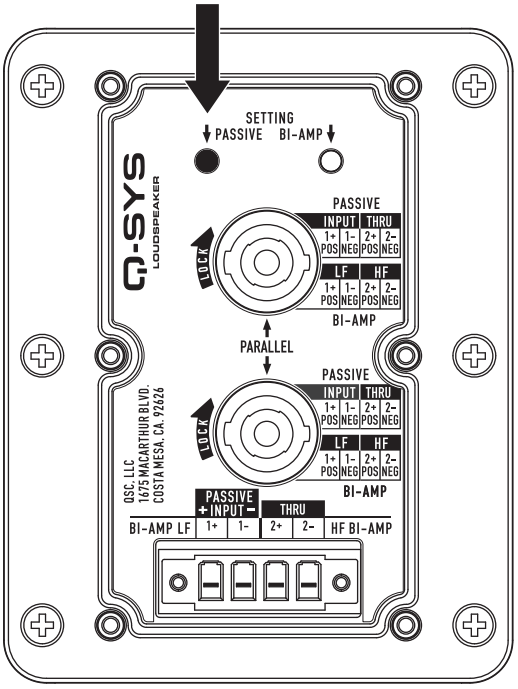
To change from Passive to Bi-amp or Bi-amp to Passive mode in PL-LA loudspeakers:

1. Remove the six screws holding the input cup in place.
2. Remove the input cup, being careful not to place excess stress on the connecting wiring harness.
3. Remove the wiring harness plug from the receptacle at the bottom of the cup.
4. Insert the wiring harness plug into the desired mode receptacle at the bottom of the cup.
5. Turn the input cup over and verify that yellow is visible in the proper SETTING port. If not, move the plug into the desired receptacle.
6. Carefully place the input cup back into position on the enclosure, being careful not to bind or pinch any of the wiring.
7. Secure the input cup with the six screws removed in step 1.
8. Use the corresponding voicing in the amplifier

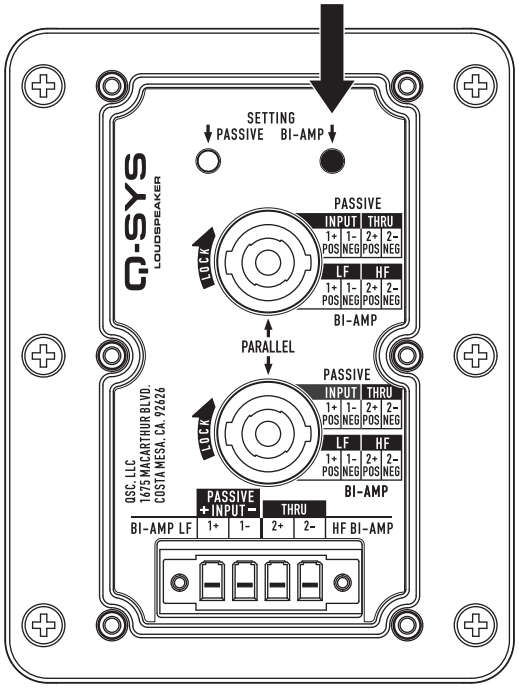


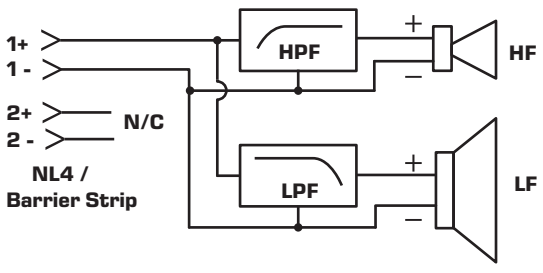


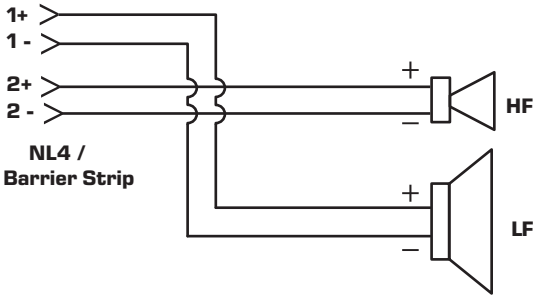
Passive Mode



Bi-Amp Mode







Outdoor Deployment

This equipment has been designed to withstand weather conditions encountered in protected outdoor environments. Ensure that the loudspeakers are positioned under cover to protect them. Direct deployment in environments close to the seaside or with a high degree of corrosion is not recommended.

While the grille is protected by a mesh that avoids ingress of water into the port, it is recommended to angle the loudspeaker with a down-tilt of 5° to allow eventual creeping water to get out of the loudspeaker by gravity.

This loudspeaker features the following:

- Exterior wood for PL-SUB18 subwoofer
- ABS enclosure for PL-LA loudspeakers
- IEC 60529 IP54 rating
- Stainless screws
- UV and corrosion treated steel grille
- Aluminum rigging
- Hydrophobic stainless steel mesh behind grille
- Input cup (IP65) sealing with gland

Knowledge Base

Find answers to common questions, troubleshooting information, tips, and application notes. Link to support policies and resources, including Q-SYS Help, software and firmware, product documents, and training videos. Create support cases.
support.qsys.com

Customer Support

Refer to the Contact Us page on the Q-SYS website for Technical Support and Customer Care, including their phone numbers and hours of operation.
qsys.com/contact-us/

Warranty

For a copy of the QSC Limited Warranty, go to:
qsys.com/support/warranty-statement/