EAW®
EASTERN ACOUSTIC WORKS

KF810P/SB818P QUICK START GUIDE

Contents

1. READ THIS FIRST

Congratulations on your purchase of the KF810 passive line array loudspeaker! Let's cover some basics before you get started.

1.1 SAFETY FIRST

The terms "Caution," "Warning," and "Danger" are used throughout this guide to alert the reader to important safety considerations:

CAUTION: This could expose you or the equipment to danger or damage. Proceed carefully.
WARNING: This will damage the equipment or injure the user.
DANGER: This will cause immediate damage to the equipment or is extremely dangerous (even life-threatening) to the user.

1.2 GENERAL PRECAUTIONS

WARNING*: Setting up this equipment is potentially hazardous, and everyone involved in its setup is responsible for their own safety. We designed this equipment under the presumption that qualified professionals would be directly involved in its implementation, and we are not liable for any damages due to improper setup or use.*

WARNING*: If you aren't knowledgeable in safe hardware and rigging techniques, you should not attempt to suspend these speakers. Doing so could damage the equipment, and even put your life in danger.*

2. INTRODUCTION

2.1 KF810P

The KF810 line array system offers best-in-class output, true broadband pattern control, and integrated 3-way performance, hallmarks of the legendary KF series.

The KF810P incorporates specific design features tailored for the installation market: clean aesthetics offered in black or white, invisible wiring, and concealed 3-point rigging. A weather rated option allows for long term permanent installation in demanding environments backed by EAW's full warranty.

Engineered for a wide variety of applications, the compact KF810 module is comprised of dual 3" voice coil high frequency compression drivers, four 5" mid-frequency transducers and two 3"

voice coil high power 10" LF drivers. The output of these sources unites through an integrated horn that occupies nearly the entire forward face of the speaker enclosure, delivering up to 145dB with accurate pattern control to 250Hz to master the most challenging acoustic spaces.

2.2 SB818P

The SB818P is a high output, single 18" mid-size subwoofer system. SB series subwoofers are the choice where the best sonic performance, highest reliability, and most robust physical construction are required.

SB818P is direct radiating, with optimally tuned, vented enclosures. Top quality drivers provide the highest output and best sonic performance possible for a given form factor. It is designed to be used with today's sophisticated digital signal processing to optimize the LF response.

The versatile, all-purpose SB818P subwoofer works well with most full-range loudspeakers in a variety of applications. It is designed for permanent installation where the fatter-sounding output of an 18-inch driver is desired. Alternatively, the SB818P is flyable and ultra-compact, ideal for installs or other applications with minimal floor space for subwoofers.

3. UNBOXING

3.1 WHAT'S INCLUDED

M8 x 22 bolts with washer and locking washer
M8 x 30 bolts with washer and locking washer
M10 bolts with corresponding washers and nuts
4-pin Phoenix connector

3.2 WHAT'S NEEDED

4 mm hex allen drive
17mm socket or wrench
Socket extender

3.3 SHIPPING DAMAGE

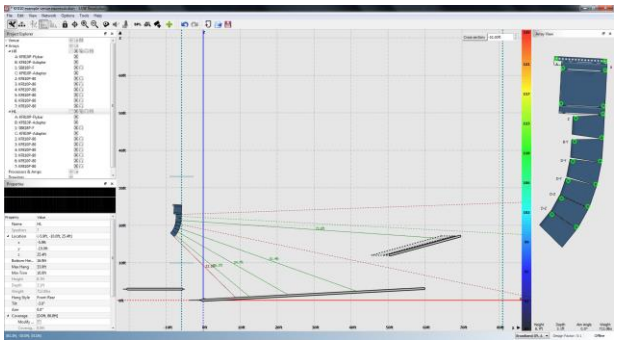
If your loudspeaker shows signs of damage upon arrival, email Sales@eaw.com. We will help you in any way possible.

3.4 RETURNING PRODUCTS TO EAW

If you need to return your loudspeaker directly to us, contact the EAW Service Department for a Return Authorization. Use the original shipping carton and packing materials when you ship it back to us. If the shipping carton is damaged, contact us for a new carton (there is a small charge for this). Please make sure to package it well.

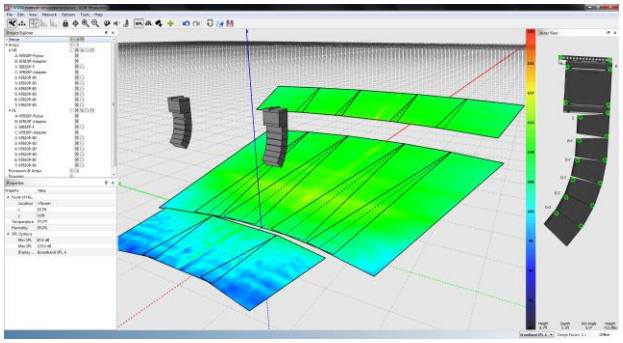
4. ARRAY DESIGN & OPERATION

4.1 RESOLUTION™ SOFTWARE



A KF810 array is intended for use with our Resolution software, downloadable from the Resolution product page on our website (eaw.com).

Resolution's primary function is to determine the configuration providing the best performance for a given application. Various venue dimensions are entered that allow Resolution to calculate the resultant array performance. Resolution can automatically generate a suggested array or an end user can tailor a Resolution generated array or build a unique array to view array performance.



For complete instructions about operating EAW Resolution, click on the About/Help menu when running software. Instructional videos are also available on the EAW YouTube Channel

4.1.1 Computer Requirements

Resolution requires 2 GB RAM, 1 GB storage, and Windows ® 7, 8, 8.1, or 10. It is not designed to work with Macintosh® operating systems.

4.1.2 Resolution Features

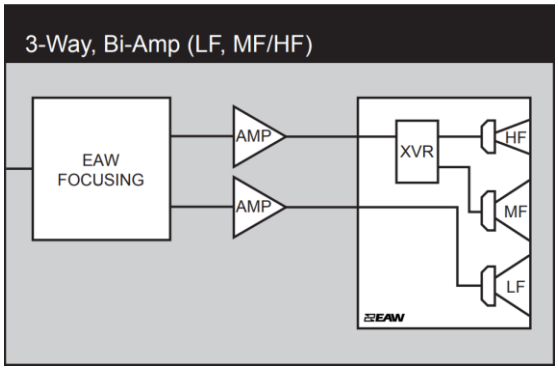
- Driven by proprietary FChart acoustics modeling software
- Predict direct SPL levels and frequency response at any point in any venue
- Calculate mechanical load
- Factor environment conditions into the calculations
- Supports multiple EAW products
- Arrays of EAW loudspeakers can be entered manually or created with embedded auto designer

4.2 ENGINEERING DESIGN

Isophasic Waveguide

The Isophasic Waveguide transforms the acoustic input source to a true Isophasic output. The waveguide provides incredible pattern control at the exit point of the horn mouth with minimum drag on the HF. The Isophasic output is achieved by equalizing the lengths of the acoustic path from any source point to the corresponding exit point, all while controlling the coverage angles at the exit mouth of the horn. The output is maximized through a single minimum curvature and minimum surface area along the acoustic output path. This results is a gently curving acoustic path that begins and ends substantially perpendicular to the entrance and exit of the waveguide. No abrupt changes in the direction of the acoustic energy ensures no internal acoustic reflections or distortions.

4.3 SIGNAL DIAGRAM AND PROCESSING



4.3.1 Multi-amplified Mode

Signal processing in the form of a digital signal processor (DSP), is required for all multi-amplified products.

Factory Signal Processing Settings:
The signal processing settings determined by EAW should be fully implemented "as is." They will normally provide excellent results in a variety of venues. These settings are determined from careful laboratory measurements and affect many aspects of the loudspeaker's performance.

DSP Output Gains:
EAW's output gain settings are determined so as to achieve this condition.
Unprocessed Input Signal: EIA-426B spectrum with an average level of 0 dBu / 0.775 V
Processed Output Signal: Average level of 0 dBu / 0.775 V for the least sensitive passband.

WARNING: *Do not under any circumstances use "generic" or your "favorite" crossover, output equalization, or other settings. Arbitrary settings will redesign the loudspeaker's performance with the results being equally arbitrary. Always use EAW's recommended signal processing settings. Performance, in terms of frequency response, beamwidth consistency, output level capability, and wavefront coherency is dependent on the EAW-engineered crossover and other processing settings.*

4.4 AMP GAIN SETTINGS

All amplifiers for all passbands must be set to the same voltage gain, regardless of their power output ratings. Equal amplifier gains are required to maintain array coherence throughout the venue.

This does NOT mean the same input sensitivity, but the same input to output voltage gain. Consult your amplifier manufacturer if this cannot be readily determined. Do not selectively boost or attenuate loudspeaker levels at the amplifiers to achieve consistent SPL at various distances. This is achieved by adjusting the array curvature as described above.

4.5 USER ADJUSTMENTS

4.5.1 Equalization

EAW recommends that 1/3 octave or careful use of parametric equalization be used to modify performance to accommodate a particular program, venue characteristics, or personal taste.

4.5.2 Array Measurements

It is recommended to use a multi-channel measurement software platform to investigate the interaction between an array and the acoustical characteristics of a venue. This is a fast, yet sophisticated, process that will indicate problem areas due to venue characteristics. Usually it is a matter of applying small amounts of 1/3 octave or parametric equalization to adjust significant anomalies.

4.6 AMPLIFIER POWER REQUIREMENTS

As is true of all professional loudspeaker systems, the performance of the KF810 depends on amplifiers delivering an adequate supply of clean power. Determining the appropriate power amplifier wattage for a given loudspeaker and application is a subject of debate. In fact, there are three distinct issues regarding amplifier power as discussed in the next sections: "Power Ratings," "Selecting an Appropriate Amplifier Size," and "Operating Limits."

For more information on selecting amplifiers, please consult EAW's Design team.

4.6.1 Power Ratings

CAUTION: *The rms voltage limits listed above are related to the thermal limits determined from our standard power test. In this test, transducers are "exercised" to a point of damage or failure. The test signal has a 6dB crest factor (peak to average ratio). A maximum continuous voltage limit for the loudspeaker is then determined based on the test results and on the transducer's application in the loudspeaker. The powers listed in this table are calculated as the square of the rms voltage limit divided by the sub-system's nominal impedance (Z) in ohms.*

4.6.2 Selecting an Appropriate Amplifier Size

The wattages listed in the above chart are intended primarily as points of comparison with the power ratings of other loudspeakers. For this purpose, each wattage listed should be 1.5-2 times the wattage listed. For example, 600W should be considered as a range from approximately 900W to 1200W.

Proper amplifier selection requires a considered analysis for the particular application. In many applications, the wattages listed will NOT correspond to the best amplifier sizes for optimizing loudspeaker reliability and performance. Amplifiers should be sized according to both the sound levels required and the type of audio signals that will be reproduced. If you are unsure of how to determine these parameters, consult a qualified professional or contact EAW's Design Team.

4.6.3 Rule of Thumb for Selecting an Amplifier

If the loudspeakers are used for professionally operated concert applications, a rule of thumb can be applied. Where the full output capabilities of the loudspeakers may be needed to achieve appropriate acoustic output levels, EAW recommends amplifiers with power ratings up to twice the wattages listed in the above charts. This provides a peak voltage capability of 6 dB above the specified rms voltage limit. This assumes the audio signals will have a peak to average ratio in excess of 6 dB, which is usually, but not always, true. Under this condition, the thermal limits are unlikely to be exceeded. While this rule of thumb is consistent with the EAW's testing parameters, it does NOT guarantee trouble-free operation. That is discussed under "Operating Limits."

In some cases, the amplifier power determined by the Rule-of-Thumb may not be available in acceptable products. In this event, select an amplifier within approximately +/-25% (+/- 1 dB) of the desired power. In some cases, particularly subwoofers or multiple LF subsystems powered off one amplifier channel or an amplifier in bridged mode, the desired power will exceed that available in acceptable products. In this event, select the largest amplifier possible.

WARNING: *The power amplifier sizes recommended by the above rule of thumb are capable of continuous output levels that can cause damage to or failure of the transducers. Exercise caution in operation to avoid exceeding the specified maximum rms voltage limits.*

4.6.4 Operating Limits

It is the responsibility of the audio system operator to operate the loudspeakers within their capabilities. This is the only way to ensure the loudspeakers are not stressed beyond their limits to the point of damage or failure.

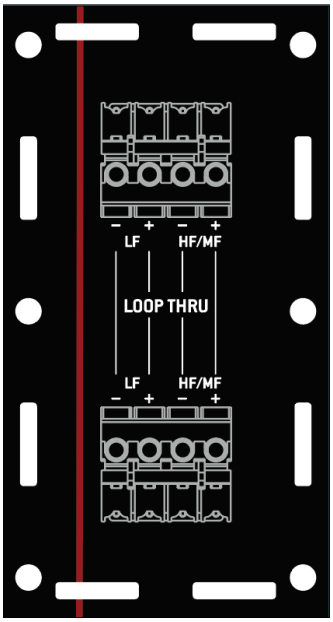
Operation beyond their capabilities usually includes, but is not limited to, one or more of the following conditions:

- Amplifier clipping
- Voltage input in excess of the specified rms voltage limit
- Peak voltage input in excess of twice the specified voltage limit Noticeable distortion
- Mechanical noise (i.e. cones bottoming out)

A suitable means for determining these conditions is highly recommended. At a minimum, the operator should have a meter display calibrated to indicate when the maximum rms voltage limits will be exceeded. This assumes amplifiers are not being driven into clipping at those limits.

5. INPUT AND WIRING

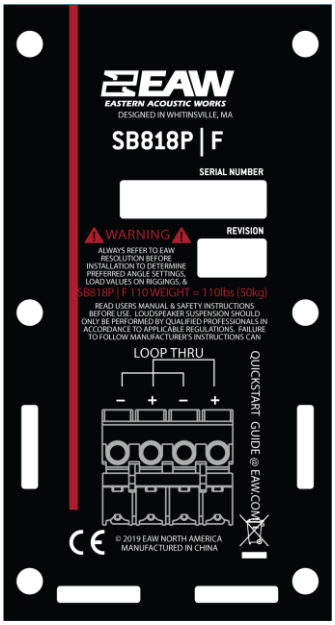
5.1 KF810 INPUT CONNECTIONS



There are two Phoenix connectors on the rear of the KF810. Use one for input, and the other to loop through to other units in the system.

5.1.1 Loop or Thru Connector

Use this connector to "daisy-chain" the input signal to multiple loudspeakers. For terminal block connections, use multiple wires to each terminal for daisy-chaining.



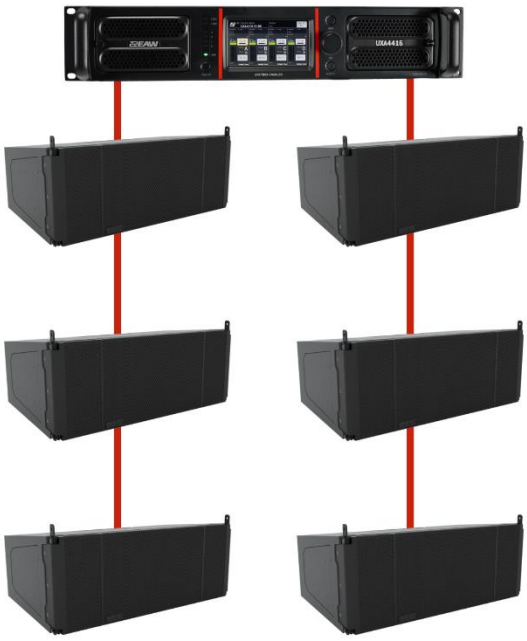
5.2 SB818 INPUT CONNECTIONS

There are two Phoenix connectors on the rear of the SB818. Use one for input, and the other to loop through to other units in the system.

5.3 Configurations

KF810P

Model	Per Channel	Per Amplifier
UXA4416	3	6



UXA4416 Configuration is recommended

SB818P|F

Model	Per Channel	Per Amplifier
UXA4416	**3**	**12**

UXA4416 Configuration is recommended

6. RIGGING

6.1 Rigging: Mounting / Suspension

DANGER: *Mounting or overhead suspension of any heavy load can result in serious injury and equipment damage. This work should be done by qualified persons following safe rigging practices in accordance with all applicable safety and construction standards. Such persons must determine the required load ratings and design factors. They must determine the mounting or suspension method that meets static, dynamic, shock, and any other load requirements. All such work must be done in accordance with and in compliance with all federal, state, and local regulations governing such work.*

CAUTION: *The user assumes all responsibility and liability for the proper design, installation, and use of any rigging and mounting systems for EAW loudspeakers.*

CAUTION: *Accessory items are available from EAW and from aftermarket suppliers to facilitate suspension, wall, ceiling, or other rigging. When using these items, review all enclosed documentation and carefully follow all instructions and safety precautions.*

6.2 Rigging Design Practices

Rigging a loudspeaker requires determining:

1. The rigging methods and hardware that meet static, shock, dynamic, and any other load requirements for supporting the loudspeaker.
2. The design factor for and the required WLL (Working Load Limit) for this support.

EAW strongly recommends the following rigging practices:

1. Documentation: Thoroughly document the design with detailed drawings and parts lists.
2. Analysis: Have a qualified professional, such as a licensed Professional Engineer, review and approve the design before its implementation.
3. Installation: Have a qualified professional rigger do the installation and inspection.
4. Safety: Use adequate safety precautions and back-up systems.

6.3 Rigging Hardware and Accessories

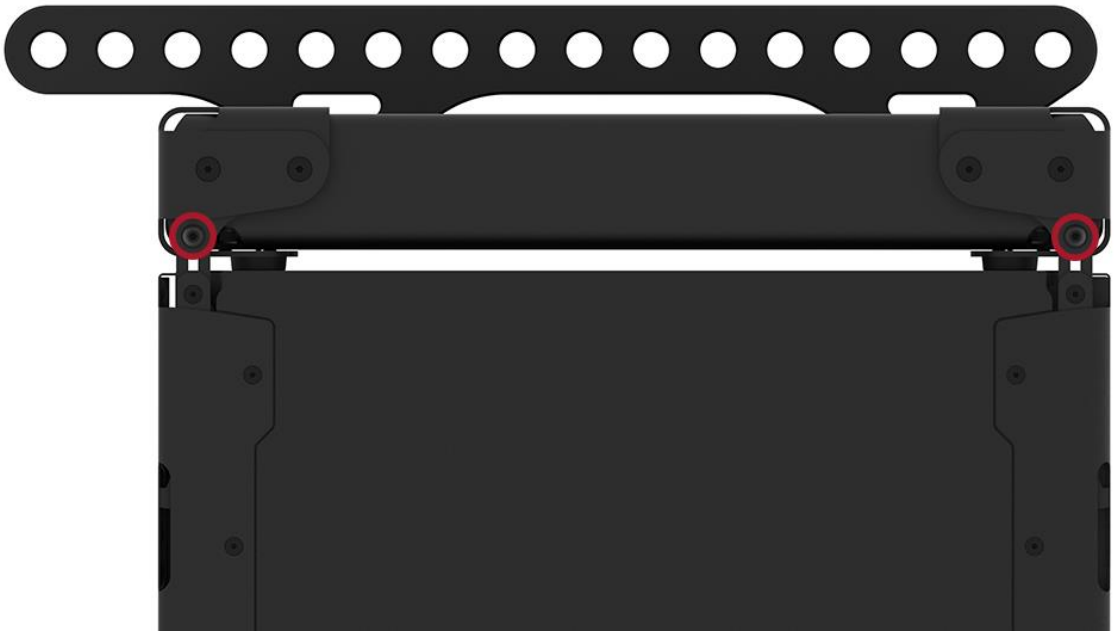
Rigging EAW loudspeakers will invariably require hardware not supplied by us. Various types of load-rated hardware are available from a variety of third-party sources. There are a number of companies specializing in manufacturing hardware for, designing, and installing rigging systems. Because of the hazardous nature of rigging work and the potential liability, engage companies that specialize in these disciplines to do the work required.

6.4 Suspension Procedures

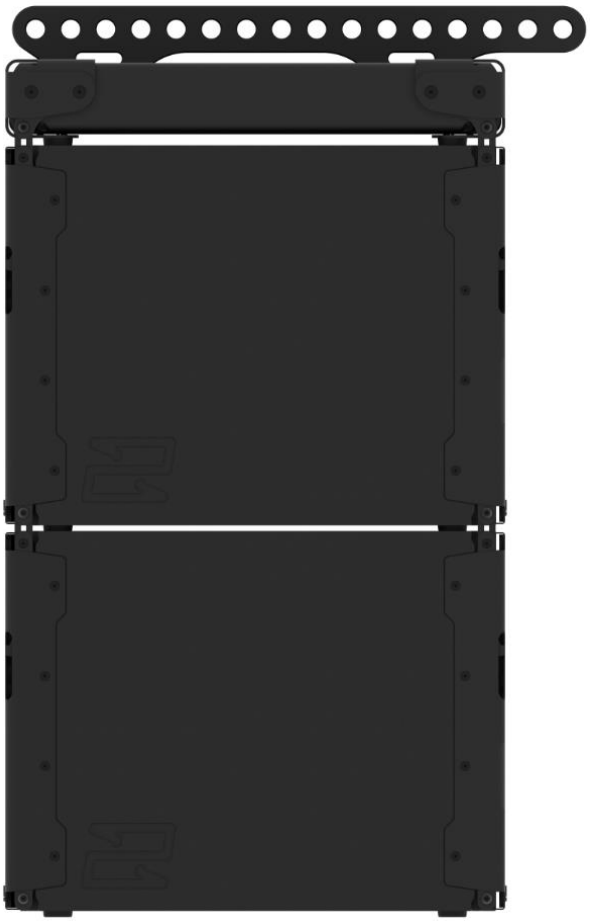
6.4.1 Flow Arrays with Sub

1. Attach stinger to the frame using 2x M10 bolts w/washer on inside and nut on outside.

2. Place flybar on top of sub and use M8 X 30 bolts to rig front and rear positions.

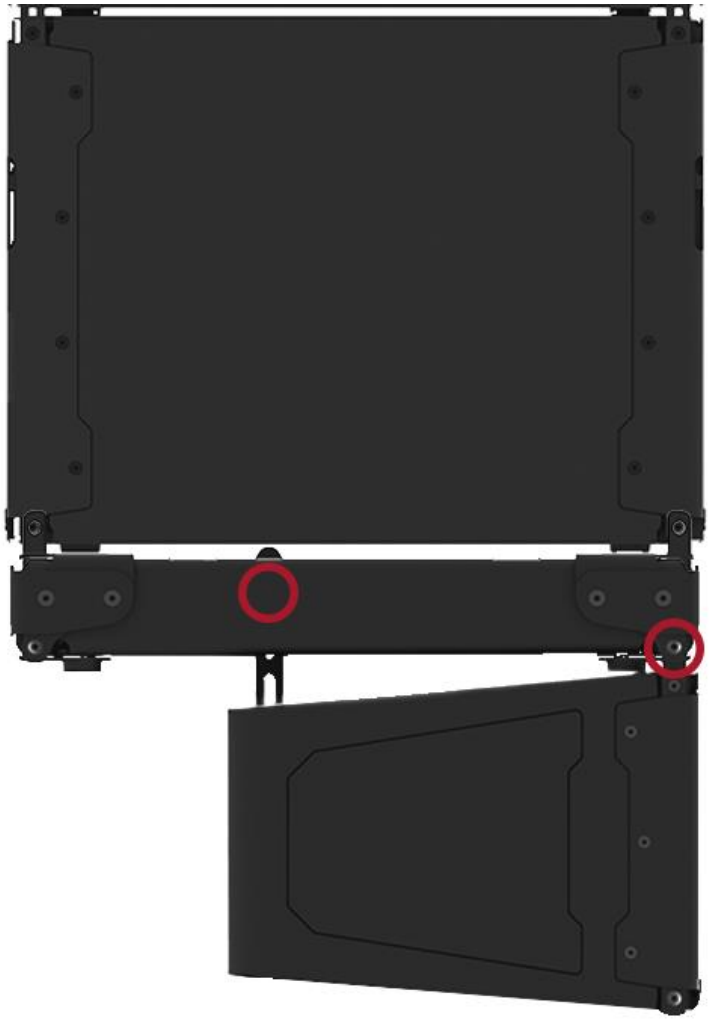


3. Attach shackle to desired stinger position and raise array.
4. Place second sub on surface underneath array and lower to attach using M8 X 22 threaded bolts to front and rear rigging.



5. Repeat to use desired sub amount in array.
6. To attach a KF810, start by attaching frame to bottom of Sub array.
7. Do so laying Frame on a surface, then lowering sub array and M8 X 30 bolts to rig front and rear positions.

8. Raise array and place first KF810 array item underneath, then lower array to KF.
9. Using M8 x 30 bolt to secure front rigging, then M10 bolt to secure rear rigging angle.

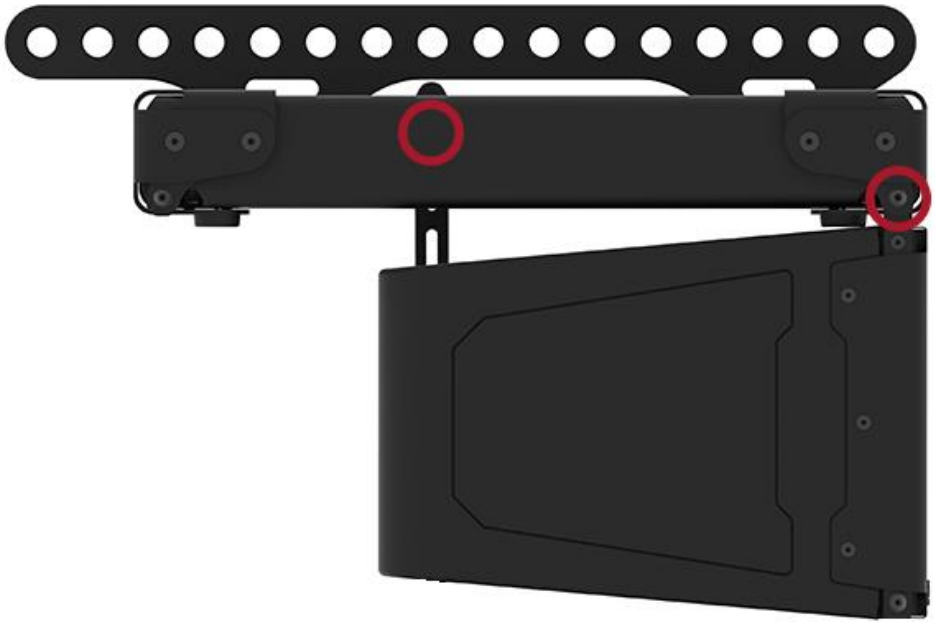


10. To connect a second KF810, repeat the same process but with M8 X 22 threaded bolt on front rigging.

6.4.2 Flow Arrays without Sub

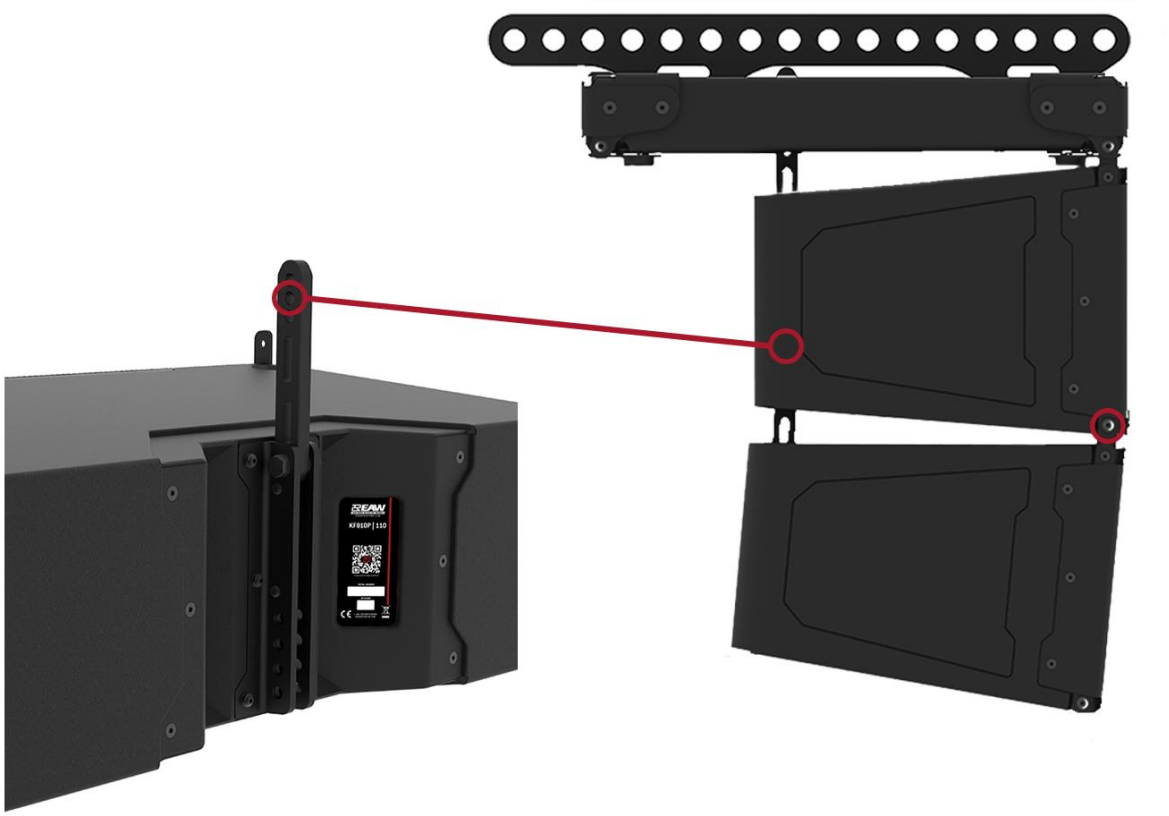
1. Attach stinger to the frame using 2x M10 bolts with washer on inside and nut on outside.

2. Place flybar on top of KF810 and use M8 X 30 bolts to rig front position.
3. Select splay angle on rear rigging and use M10 bolt to secure.



4. Attach shackle to desired stinger position and raise array.
5. Place second KF810 on surface underneath array and lower.

6. Using M8 x 22 bolt to secure front rigging, then M10 bolt to secure rear rigging angle.



7. To connect a second KF810, repeat the same process but with M8 X 22 threaded bolt on front rigging.

6.5 Ground Stacking Procedures

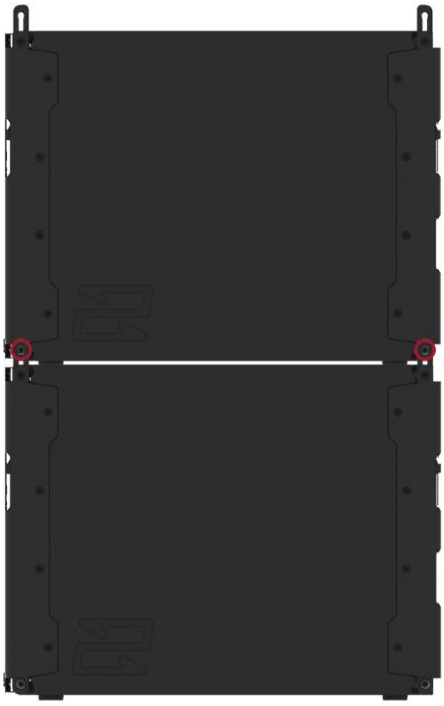
WARNING: *Ground-stacked arrays, especially the maximum recommended arrays, requires assembly by personnel qualified to ensure adequate stability from tip over for the particular application. See Section 6 for correct array assembly. Mechanical assistance will be required to lift and position enclosures for arrays taller than approximately 5 feet.*

NOTE*: Bass performance is often highly program or venue-dependent, as well as subjective as to quantity and quality. For this reason, the type, quantity, and disposition of subwoofers may vary considerably with the application. The quantity recommendations below are for general purposes,*

providing a balanced system for most music applications. Quantities may need to be adjusted up or down for specific situations.

6.5.1 Ground-Stack with Subwoofer

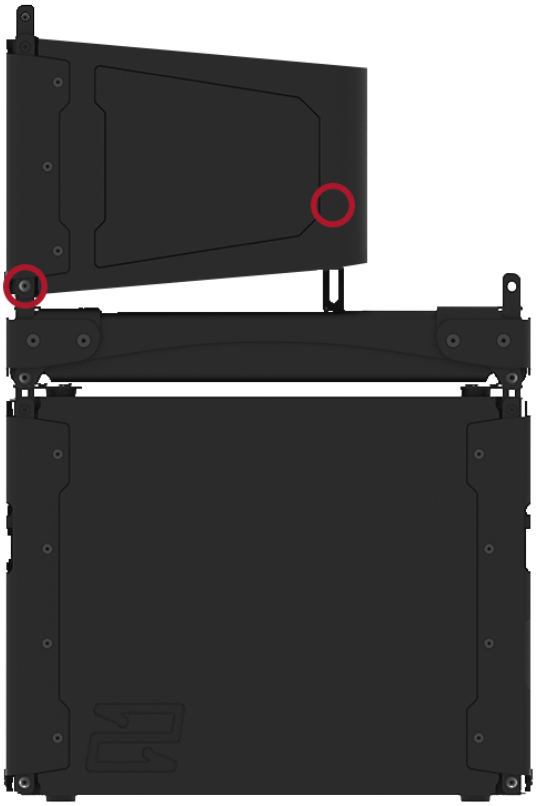
1. Place your subwoofer on the ground.
2. To attach additional subs, lift sub on top of sub beneath and use M8 x 22 bolts to secure front and rear rigging.



3. To add KF810, start by placing frame on top of sub array, and securing front and rear rigging with M8 x 30 bolts.

4. Place the first KF810 on top of frame, and secure front rigging with M8 x 30 bolts.

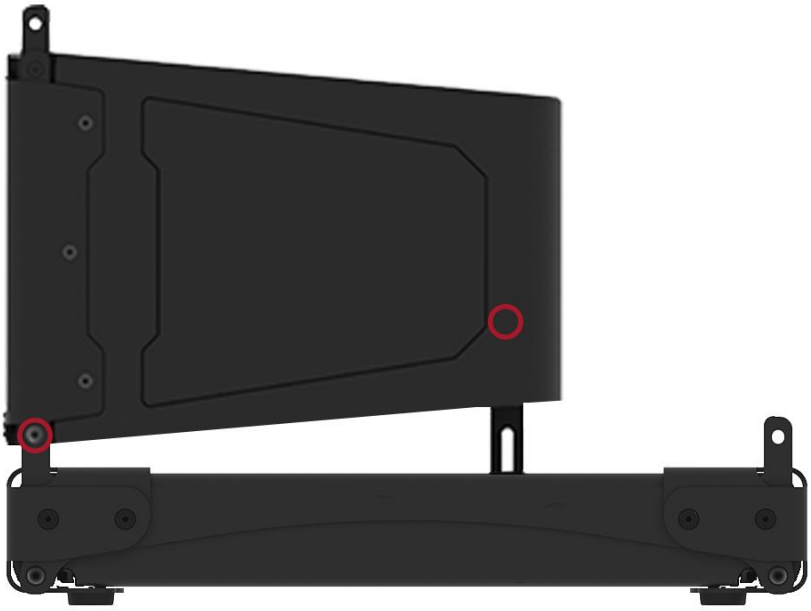
5. Using the rigging arm on the frame, choose splay angle, and secure rigging with M10 bolt.



6. Repeat this process to add additional KF810s, but with M8 x 22 threaded bolt on front rigging and rigging arm on module beneath.

6.5.2 Ground-Stack without Subwoofer

1. Place frame on the ground.
2. Place the first KF810 on top of frame, and secure front rigging with m8x30 bolt
3. Using the rigging arm on the frame, choose splay angle and secure rigging with M10 bolt.



4. Repeat same process to add an additional KF810, but with M8 x 22 threaded bolt on front rigging and rigging arm on module beneath.

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