HALO

B

System User Manual
v3 July 2023

emacoustics

liberating audio

Contents

DECLARATIONS OF CONFORMITY

This declaration applies to:

10M602 – R8 compact 3-way precision passive point source loudspeaker

This declaration also applies to all product variants, provided that they conform to the original technical specification and have not been subject to any non-factory modifications.

We herewith declare that the products listed above are in conformity with the provisions of the respective directives including all applicable amendments.

Details of the applicable declarations can be downloaded from our website www.emacoustics.co.uk on the individual product pages.

WEEE Declaration

This product and its packaging constitute the applicable product according to the WEEE directive. Please ensure that at the end of the working life of this product, it is disposed of sensibly in accordance with local and national recycling regulations.

The packaging supplied with this product is recyclable.

Please retain all packaging, however if disposing of this packaging please ensure that you comply with local recycling regulations.

WEEE Producer Registration Number WEE/HH0101WU.

1.0 - Introduction

Thank you for purchasing the revolutionary HALO B line array system from EM Acoustics. The entire HALO system family has been designed and rigorously tested to give you the utmost in sonic performance and many years of reliable, trouble-free operation. Please take the time to read this user manual thoroughly to ensure you get the best performance from your system and to ensure you set it up correctly and safely. If you have any questions or are in any doubt whatsoever about any aspect of your HALO system, please do not hesitate to contact us directly or your local EM Acoustics representative.

The HALO B system draws from its bigger brother HALO A, and utilises our patent-pending multi-drive unit plan wave simulation manifold. This device combines the energy of four 1" exit ring-radiator compression drivers, via geometrically-identical acoustic paths, into one plane wavefront. The end result is not only a very accurate plane wave representation, but also significantly higher headroom than comparable systems to HALO Arena. The high frequency section is married to two state-of-the-art 8" neodymium low frequency transducers, in an optimally tuned and intelligently braced enclosure. The acoustic package is combined with an intuitive and flexible rigging and flying system, and the DQ Series of advanced system amplifiers for a complete turnkey medium format line array solution.

This manual contains all the information you should need on topics of set up, amplifier connection, flying & stacking and basic service. If you feel we have missed anything, or you have a question not covered by this manual, please visit our website www.emacoustics.co.uk and send us a message or give us a call – we're only too happy to help.

Unpacking

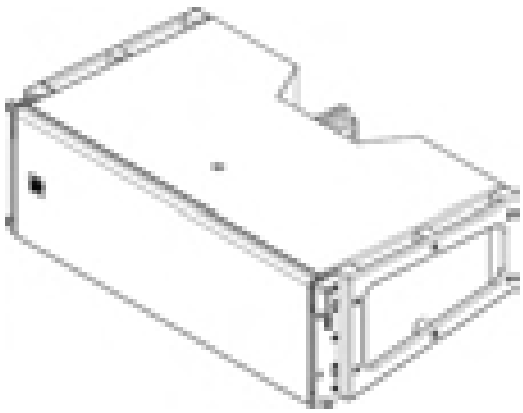
Please take care when unpacking your loudspeaker system. Once unpacked, please inspect each enclosure thoroughly for any transit damage and in the case of any damage please notify your carrier immediately. It is the responsibility of you, the consignee, to instigate any claim. Please retain all original packaging in case of future re-shipment.

2.0 – HALO-B System Components

The HALO B system comprises one loudspeaker model, a compatible subwoofer and associated flying hardware and accessories. Details of the different components are given below – all enclosures and flying grids work on the same principles and use similar if not identical hardware.

HALO-B

2-way medium format line array element



FEATURES & BENEFITS

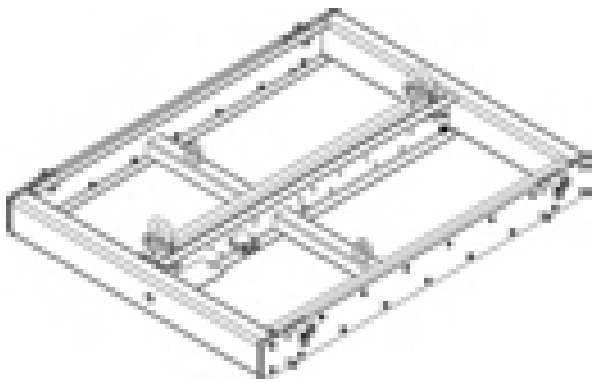
- Signature EM Acoustics "maximum headroom" design approach ensures consistency of performance regardless of SPL level.
- Extremely consistent horizontal dispersion pattern across the operating frequency band nominal 110-degree pattern is maintained down to 350Hz.
- Compact enclosure with low weight means less truck space used and smaller motors required.
- Enclosure coated with 3-step polyurethane process - ensuring the cabinets are not only weather resistant but more resilient to impact damage.
- Intuitive, simple 3-point flying system, assembled from ultra-high tensile strength steel with Xylan™ coating for enhanced durability.
- Biamplified design for maximum efficiency with amplifier channel count.

KEY SPECIFICATIONS

ENCLOSURE TYPE:	2-way reflex loaded line array element
DRIVE UNITS:	LF: 2 x 8" / HF: 4 x 2.5"
FREQUENCY RESPONSE:	65Hz - 19kHz +/-3dB
NOMINAL DISPERSION1:	110 horizontal, vertical dependent on array config
MAXIMUM SPL:	135dB continuous, 141 dB peak
NOMINAL IMPEDANCE:	LF - 8 ohms / HF – 16 ohms
DIMENSIONS (HxWxD):	262 (10.3) x 772 (30.4) x 464 (18.3) mm/(ins)
NET/SHIPPING WEIGHT:	29/32kg (63.8/70.4lbs)

FG-HALO-B

Master Flying Grid



The FG-HALO-B is the master flying grid for the system, and provides a means of safely and swiftly flying arrays of HALO-B elements and/or the companion ST-215 subwoofer. Up to twenty four HALO-B elements can be safely flown in any configuration with a safety factor of 10:1. The FG-HALO-B is supplied with two pickup links to use as suspension points - it is strongly recommended that arrays larger than twelve elements use two lifting points for control and ease of use.

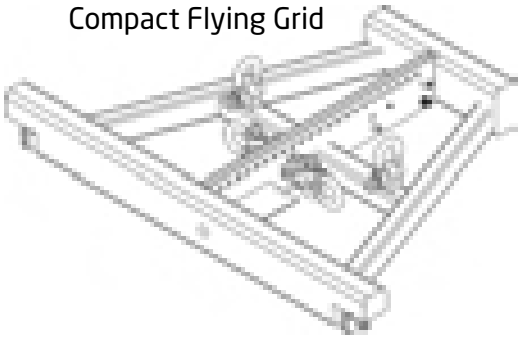
The FG-HALO-B can also be used as a means of ground stacking HALO-B systems by inverting the grid. Ground stacks of up to 10 HALO-B elements can be assembled in this way.

The FG-HALO-B is supplied with four 2t WLL bow shackles.

Weight (without shackles) 32.5kg / 71.5lbs
Weight (including supplied shackles) 33.9kg / 74.6lbs

CG-HALO-B

Compact Flying Grid



The CG-HALO-B is a compact flying grid, designed to safely suspend smaller HALO-B arrays when space is at a premium. Physically smaller and lighter than the FG-HALO-B master grid, the CG-HALO-B can safely suspend arrays of up to 16 HALO-B elements at 10:1 safety factor. The FG-HALO-B is supplied with two pickup links to use as suspension points - it is strongly recommended that arrays larger than twelve elements use two lifting points for control and ease of use.

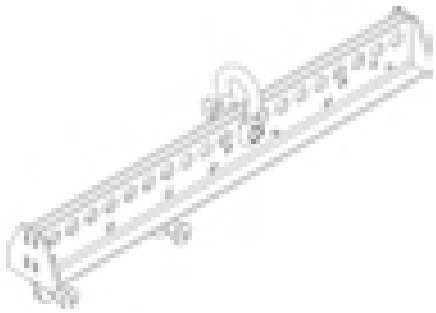
The CG-HALO-B can also be used as a means of ground stacking HALO-B systems by inverting the grid. Ground stacks of up to 6 HALO-B elements can be assembled in this way.

The CG-HALO-B is supplied with four 2t WLL bow shackles.

Weight (without shackles) 16kg / 35.2lbs
Weight (including supplied shackles) 17.4kg / 38.3lbs

EXT-HALO-B

Extension Beam for CG-HALO-B



The EXT-HALO-B is used in conjunction with the CG-HALO-B compact flying grid to achieve more extreme up/down-tilt angles in flown configurations.

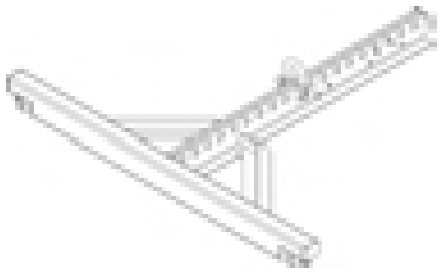
The EXT-HALO-B attaches to the spine of the CG-HALO-B – extending out the rear for increased down-tilt, or the front for increased uptilt.

The EXT-HALO-B can be used to safely suspend HALO-B arrays up to 12 elements deep with a 10:1 safety factor.

Weight 5kg / 11lbs

SM-HALO-B

Simple Mounting Frame



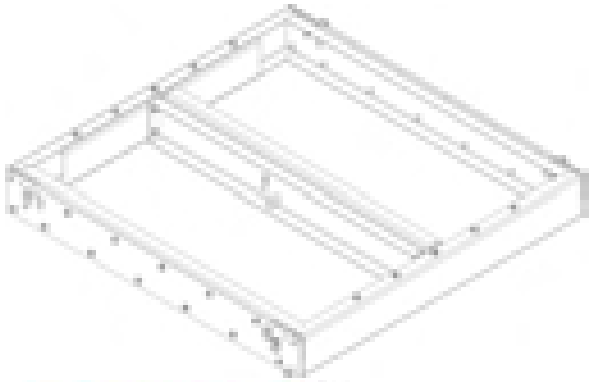
The SM-HALO-B is intended to suspend small arrays – up to four elements – quickly and cost-effectively. The SM-HALO-B is ideal for corporate or theatre settings where multiple small arrays are required.

The SM-HALO-B can be used to safely suspend HALO-B arrays up to 4 elements with a 10:1 safety factor.

Weight 8kg / 17.6lbs

LG-HALO-B

Subwoofer Linking Grid



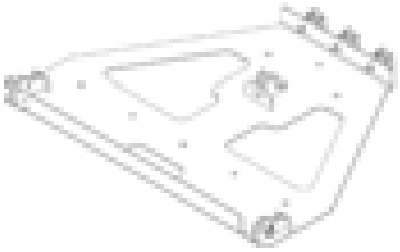
The LG-HALO-B is intended to interface between ST-215 subwoofers and HALO-B arrays in either flown or ground stack configurations.

The LG-HALO-B can be used to safely suspend HALO-B arrays up to 22 elements with a 10:1 safety factor.

Weight 22kg / 48.4lbs

GS-HALO-B

Ground Stack Plate



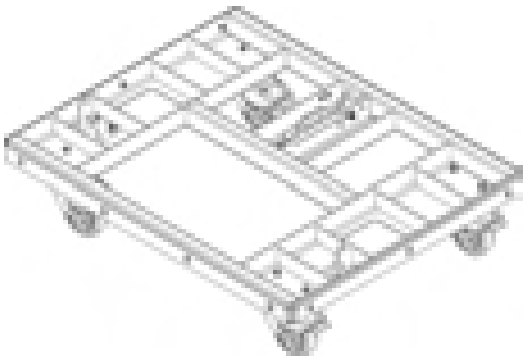
The GS-HALO-B is a simple plate designed for ground stacking small HALO-B arrays on stages, or larger arrays on top of ST-215 subwoofers. M8 locking knobs secure the GS-HALO-B to the ST-215 for neat arrays of up to 6 HALO-B elements. The GS-HALO-B can also be used as a neat base plate when using HALO-B as a front-fill enclosure.

In installation applications, the GS-HALO-B can be used to mount pairs or single elements from ceilings if required.

Weight 10.8kg / 23.8lbs

WC-HALO-B

Touring Wheel Cart



The WC-HALO-B is a wheelcart for transporting up to four HALO-B elements safely & securely. An optional TC-HALO-B padded transit cover can be used to protect full wheelcarts of four elements.

Dimensions of the WC-HALO-B are optimised for truck packing, so the carts fit three wide in a standard truck. The width of the WC-HALO-B is the same as the depth of the WC-HALO-A, to ensure compatible truck packing when both systems are transported together.

WC-HALO-B carts stack neatly for storage when not in use.

Weight 24.9kg / 54.8lbs

CHAIN-HALO-B

Extension Lift Chain

The CHAIN-HALO-B assembly is intended to go between a motor and the FG-HALO-B or CG-HALO-B pickup link. It is a variable length chain, intended to give extra vertical clearance to accommodate motor lift chain bags. It has a SWL of 760kg and an effective maximum working length of 1000mm.

Weight 1.7kg / 3.6lbs

SAFETY-HALO-B

Chainset

The SAFETY-HALO-B assembly is a 2-leg bridle chain assembly, intended to connect the two safety points on the FG-HALO-B or CG-HALO-B to a single point for application of a secondary safety. It has an effective working length of 510mm and the following SWL:

1 tonne 0-45 degrees
1.4 tonne 45-60 degrees

The angle between the chain legs must not exceed 60 degrees.

Weight 1.6kg / 3.5lbs

3.0 - Safety Considerations

System Overview

The flying system for HALO B has been specifically designed to be flexible, intuitive and reliable. Please read this section of the user manual **extremely carefully** as the rigging of loudspeakers is a very serious matter with potentially fatal consequences should anything go wrong. If you are in **ANY DOUBT WHATSOEVER**, contact a reputable rigging company or your local EM Acoustics representative.

IMPORTANT SAFETY CONSIDERATIONS

The HALO B rigging system has been designed and constructed to a very high standard of safety, and tested to demanding specifications. To ensure the highest standards of safety, the following information on array assembly must be exactly followed and understood.

Only use EM Acoustics recommended rigging hardware and accessories, which are specifically designed for the purpose. Do not use HALO B flying hardware for any other loudspeaker system – the components are specifically designed to work with the HALO B system and are not interchangeable with any other EM Acoustics loudspeaker product or any other loudspeaker system. The use of HALO B flying hardware with other manufacturers' systems may compromise the safety standards and EM Acoustics is in no way liable for any loss, damage or injury caused by such practice.

Do not modify or alter the HALO B hardware or accessories, nor use them in any way other than that described in this manual. Rigging components supplied as part of the HALO B system are in no way interchangeable and should not be used as such.

The component parts of the HALO B rigging assembly should only be assembled in the manner described in this manual, using the fasteners and fixings stated herein. The use of fasteners and methods of assembly not described in this manual may result in an unsafe assembly and as such EM Acoustics will not be responsible for any loss, damage or injury caused by such practice. Welding, drilling or any other means of modifying any part of the flying hardware or permanently fixing components to each other is strictly forbidden.

Rigging assemblies must only be assembled using the appropriate parts and fixings as described in this manual, explicitly following the assembly instructions given herein. Rigging components must only be fixed to EM Acoustics HALO B loudspeaker systems, using the correct cabinet location points, assembly methods and fasteners specifically described within this manual.

Walls, floors and ceilings must be capable of supporting the actual load placed upon them. The rigging hardware must be safely and securely fixed to both the loudspeaker system and the supporting structure.

Secondary Safeties

It is imperative that all loudspeakers flown in any given environment should be provided with a second, independent and properly rated safety suspension point in addition to the principle load bearing means of suspension. Steel wire ropes or steel chains of an approved construction and load rating only may be used as secondary safeties. Plastic covered steel chains may not be used as secondary safeties under any circumstances. Also ensure that all local and national laws are complied with when determining your primary and secondary suspension points.

Safety Inspections

Carefully inspect all flying system components prior to use for defects or signs of damage prior to assembling a HALO Arena array. If any components damaged or **you suspect them to be damaged, DO NOT USE THEM.**

Regular scheduled tests – which are much more rigorous than visual inspections – of all rigging components must also be carried out. Safety legislation, and test/inspection requirements, will vary from country to country and as such it is the user's responsibility to ensure that local regulations are adhered to. In most cases, annual independent tests & inspections carried out by a suitably approved and qualified inspector will be required.

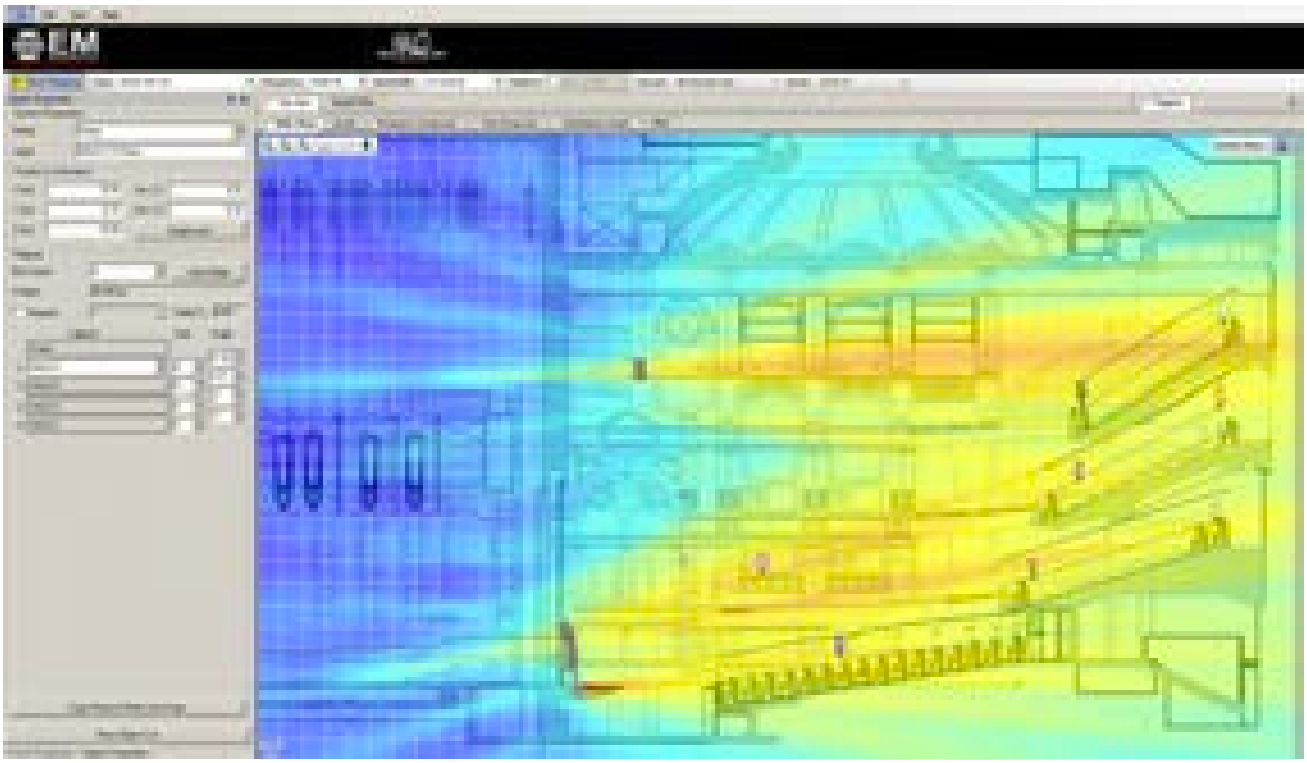
EM Acoustics recommends detailed logbooks be kept of all inspections and load tests to ensure an accurate record is kept of the testing for each EM Acoustics rigging accessory.

When flying any loudspeaker system, always wear protective headwear, footwear and eye protection in accordance with local regulations.

The rigging of a flown loudspeaker system may be dangerous if not undertaken by a suitably experienced and qualified rigger. Installation & fixing of all hanging points should only be carried out by a professional rigger in accordance with local legislation as well as the rules of the venue. The house rigger and/or venue manager must always be consulted.

4.0 – Simulation

Ease Focus 3



For safety and acoustic reasons, it is advised that users familiarize themselves with Ease Focus 3. Along with providing the user with accurate simulations for setting up HALO B, it also provides importing safety information with regards to load limits.

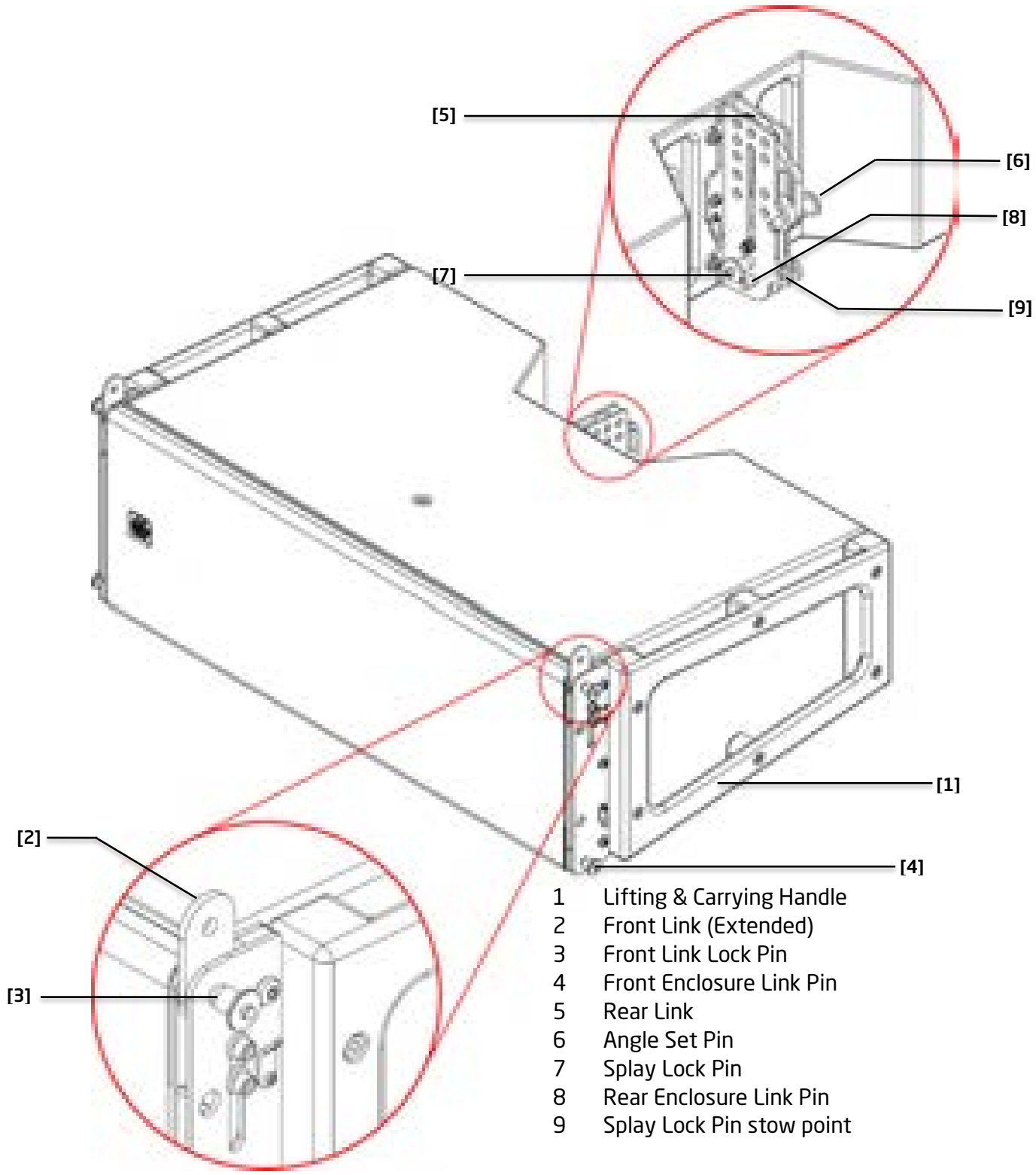
Ease Focus 3 can be downloaded for free from the AFMG website at http://focus.afmg.eu and is currently available as a stand-alone application for Windows (XP or Higher) only. It can also be downloaded directly from the EM Acoustics website with all the current product files embedded.

Tutorials for Ease Focus 3 are available from with the application itself.

For training on the design and implementation of HALO B including the specific use of Ease Focus 3, please contact your local distributor.

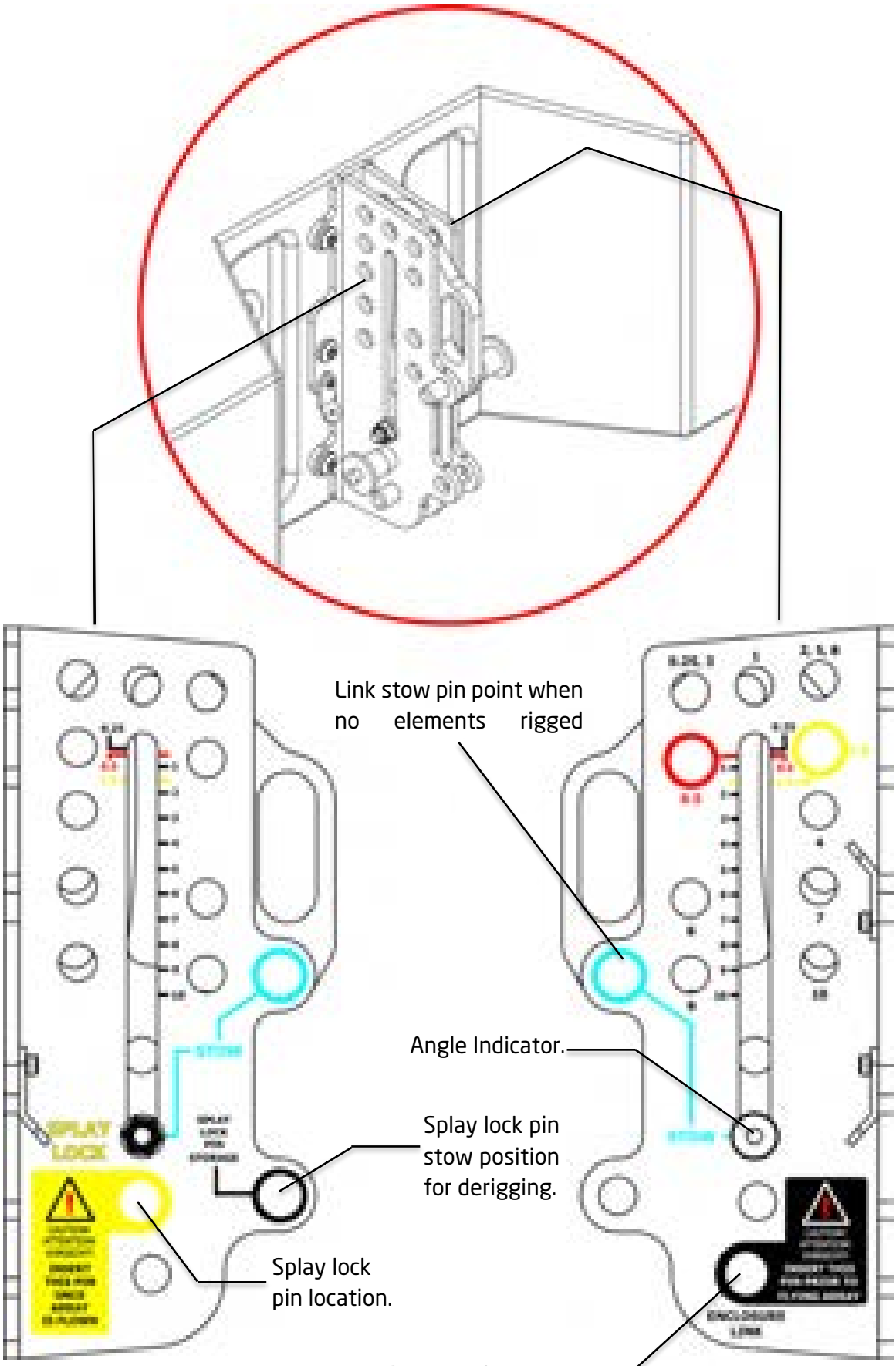
5.0 – Rigging System Overview

5.1 - HALO-B Cabinet Rigging Hardware

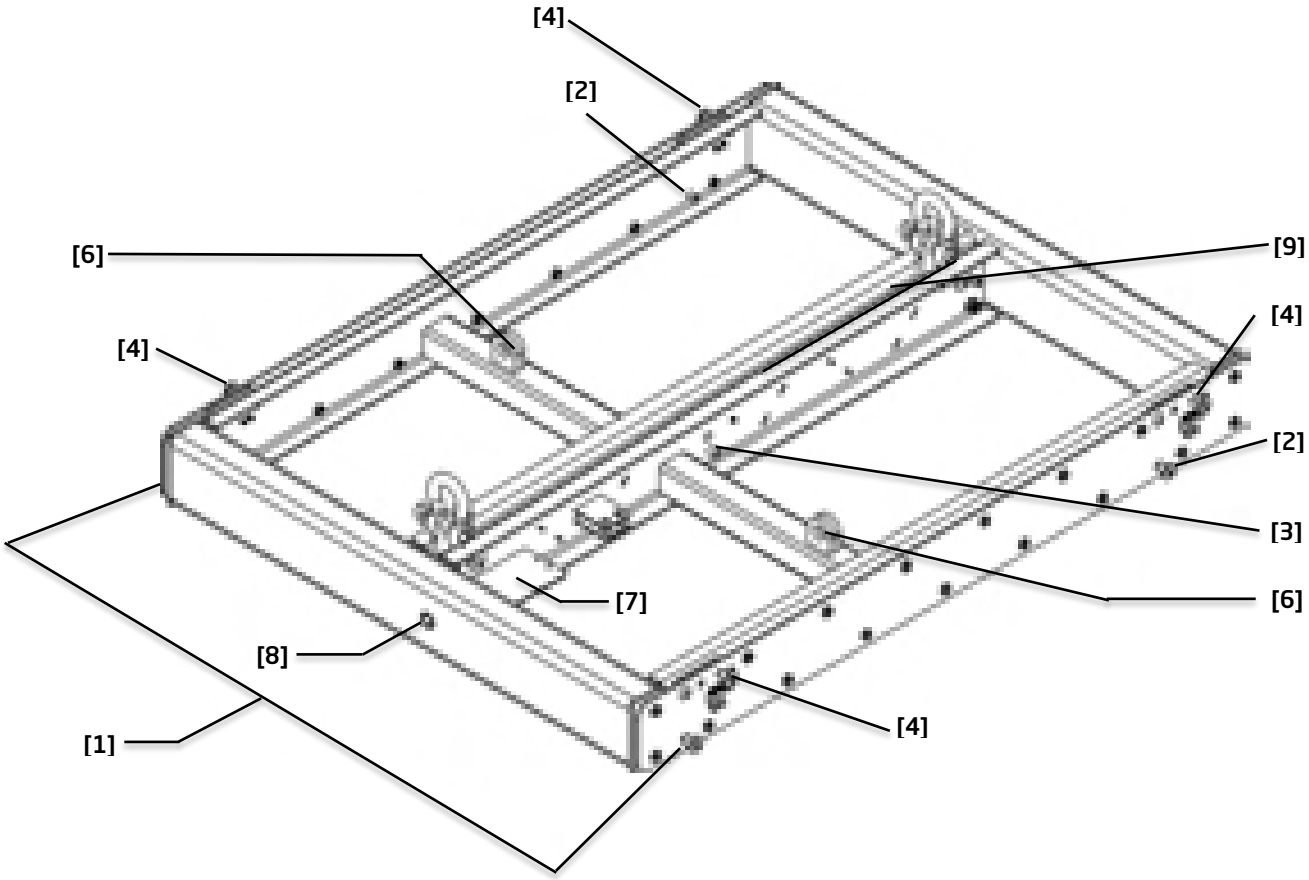


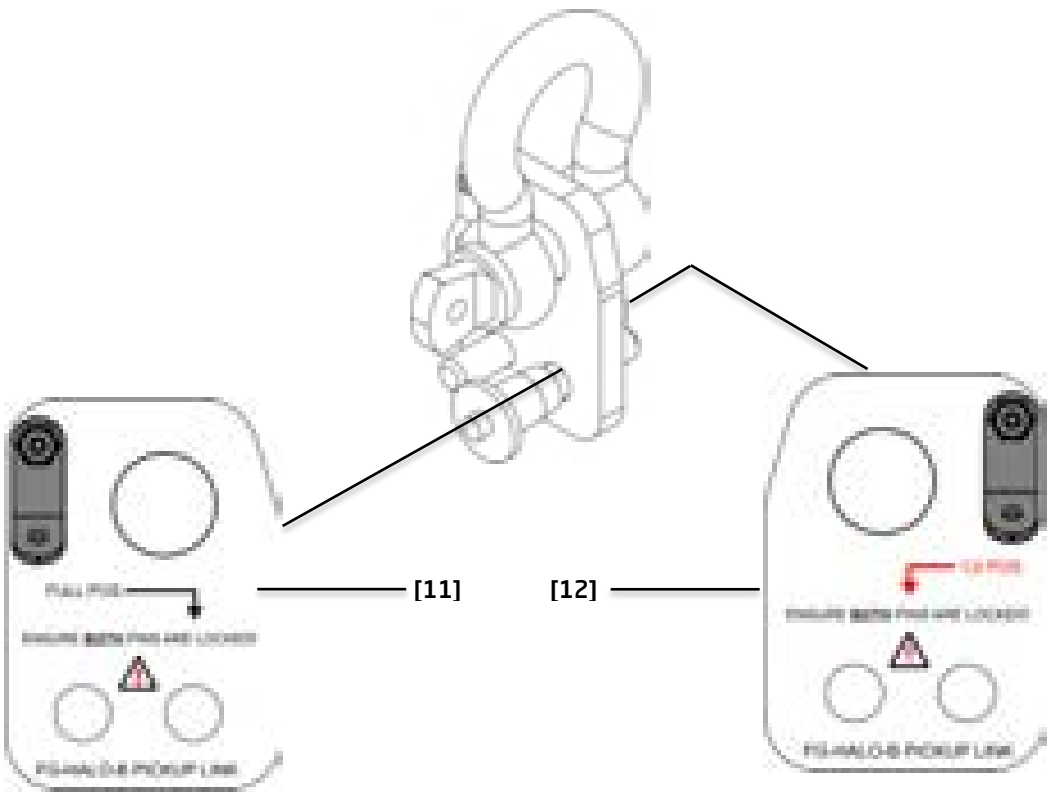
1 Lifting & Carrying Handle
2 Front Link (Extended)
3 Front Link Lock Pin
4 Front Enclosure Link Pin
5 Rear Link
6 Angle Set Pin
7 Splay Lock Pin
8 Rear Enclosure Link Pin
9 Splay Lock Pin stow point

HALO-B Rear Link Labels



5.2 - FG-HALO-B





[1] – Front Link Attachment Point

This clevis forms the area where HALO-B or ST-215 enclosure front links should be engaged. A 0.313" ball-lock pin secures each link in place.

[2] – Rear Link Attachment Point

This clevis forms the area where ST-215 subwoofer rear links should be engaged. A 0.313" ball-lock pin secures each link in place.

[3] – Splay Link Attachment Point

The splay link of the first HALO-B enclosure should engage in this slot in the spine. Pay attention to the label details with regards the indicated angle compared to actual angle for the first element in the array.

[4] – Sub Link Attachment Point

When attaching an FG-HALO-B between ST-215 subwoofers and HALO-B enclosures, four rotating links at the top of the grid in each corner engage into the bottom of the subwoofer.

[5] – Cable Pick

The retractable cable pick gives a location to safely secure the array cables at the back of the FG-HALO-B grid. It can be stowed away when not being used.

[6] – Safety Points

A secondary safety must always be used on flown arrays. Both safety points should be connected to avoid the array swinging in the event of a primary lift failure. The SAFETY-HALO-B 2-leg bridle is designed for this purpose.

[7] – Inclinometer Mounting Point

A range of laser inclinometers can be fitted to the FG-HALO-B including TEQSAS devices. An aperture is provided in the front beam for the laser to pass

[8] – Inclinometer Laser Aperture

Opening in the front grid load member for the inclinometer laser beam to pass through.

[9] – Pickup Link Location Holes

Holes are numbered 1 to 39, the appropriate locations are determined by your EASE Focus simulation. Links must be secured with the two 0.375" ball-lock pins attached.

[10] – Pickup Links (Stowed)

Stow locations for the two pickup links when the FG-HALO-B is being used for ground stack, or being stored or transported.

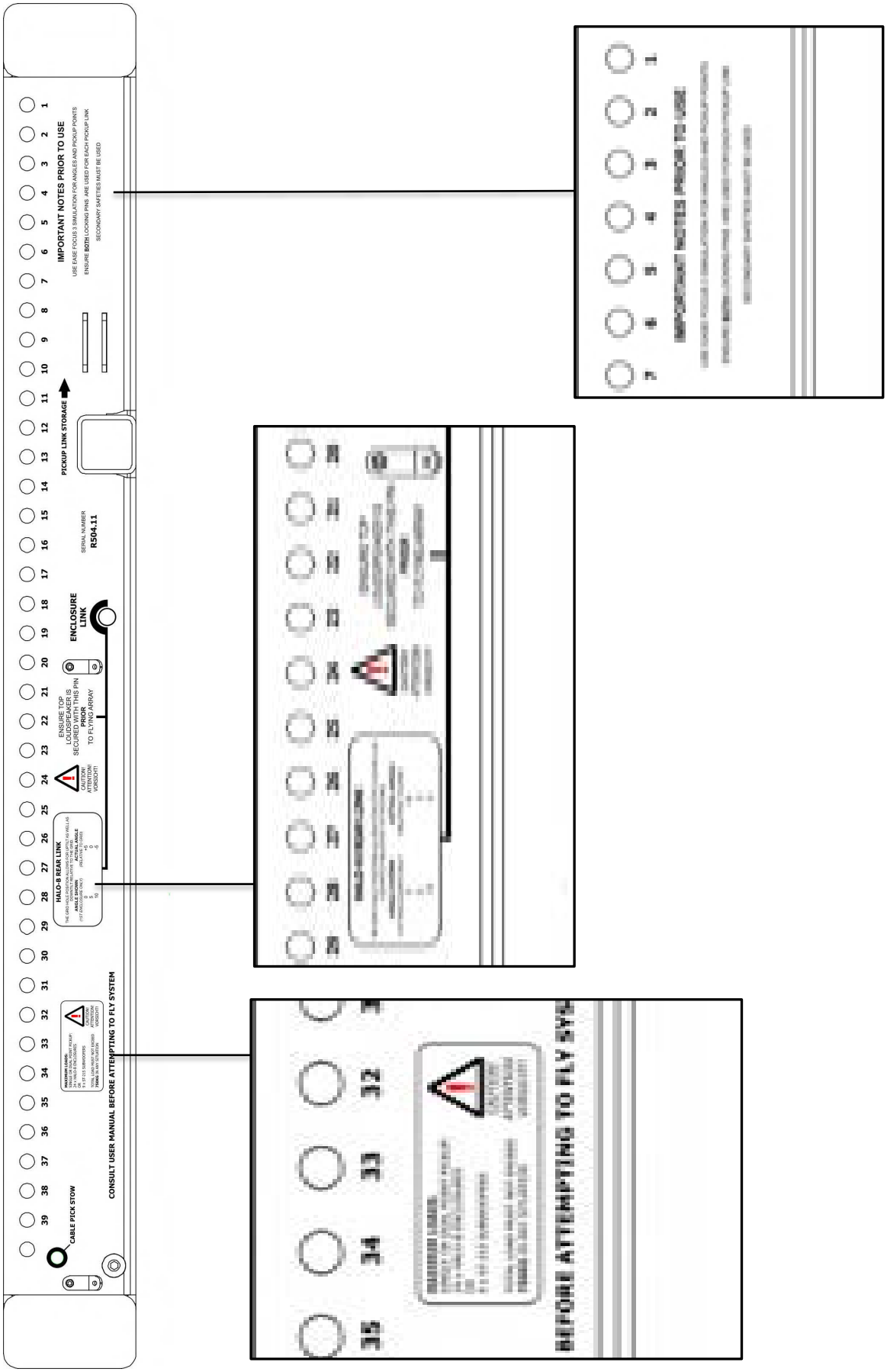
[11] – Pickup Links (Full Position)

When using a single pick point, reference Ease Focus 3 for the pick point for the desired angle. For a full position, line up the white arrow with the number on the spine

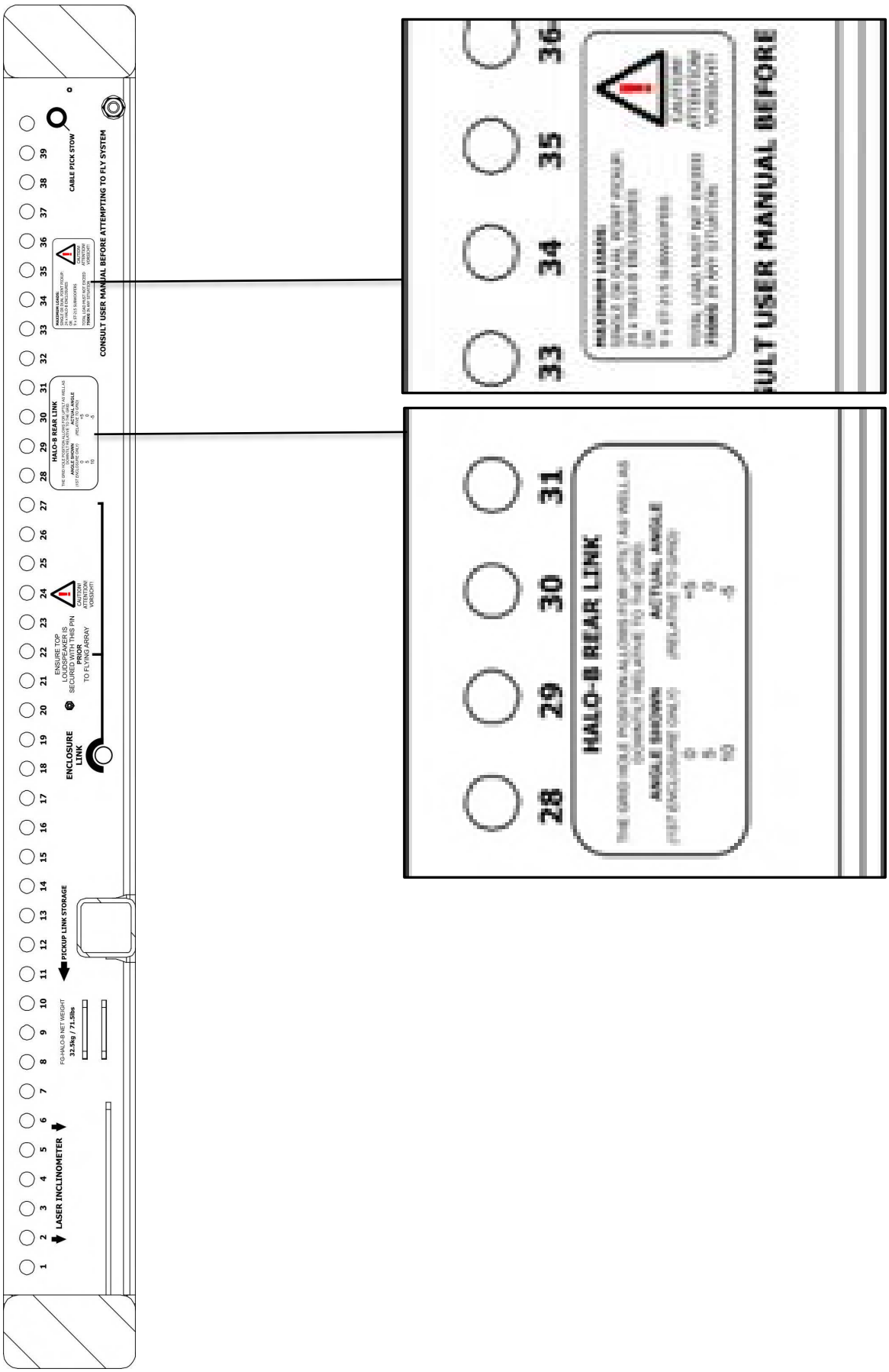
[12] – Pickup Links (Half Position)

When using a single pick point, reference Ease Focus 3 for the pick point for the desired angle. For a half position, line up the red arrow between the appropriate numbers on the spine

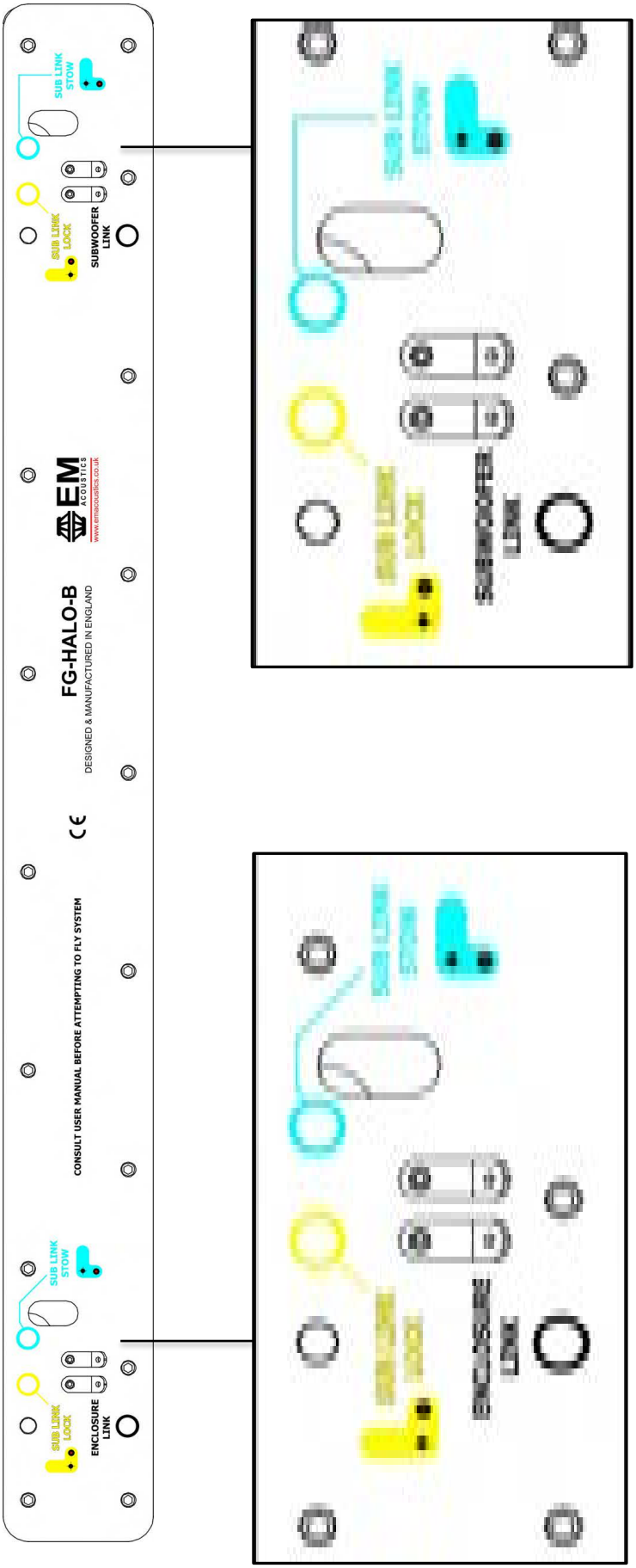
FG-HALO-B Instruction Label – Spine, Left side



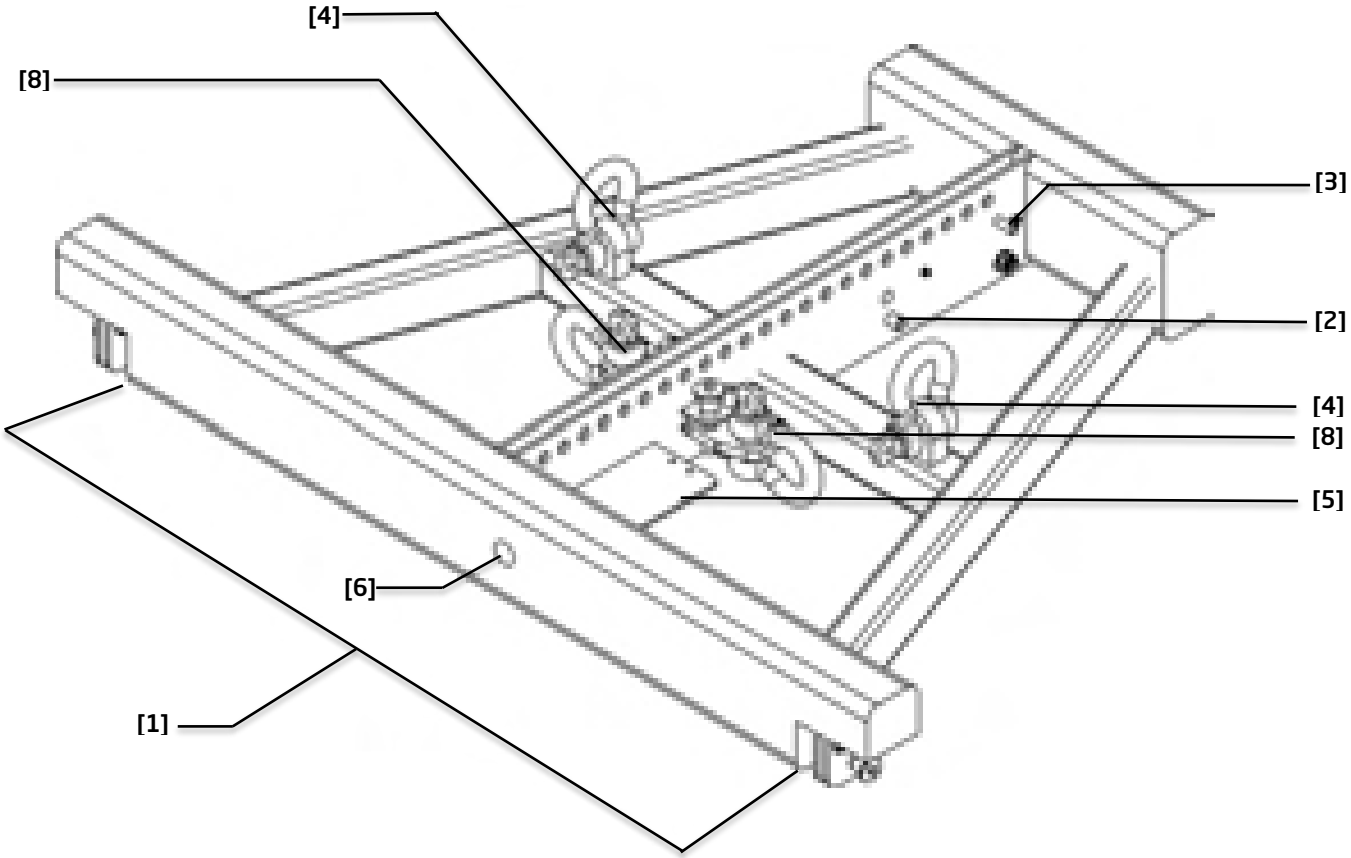
FG-HALO-B Instruction Label – Spine, Right side



FG-HALO-B Instruction Label - Side



5.3 - CG-HALO-B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[8]
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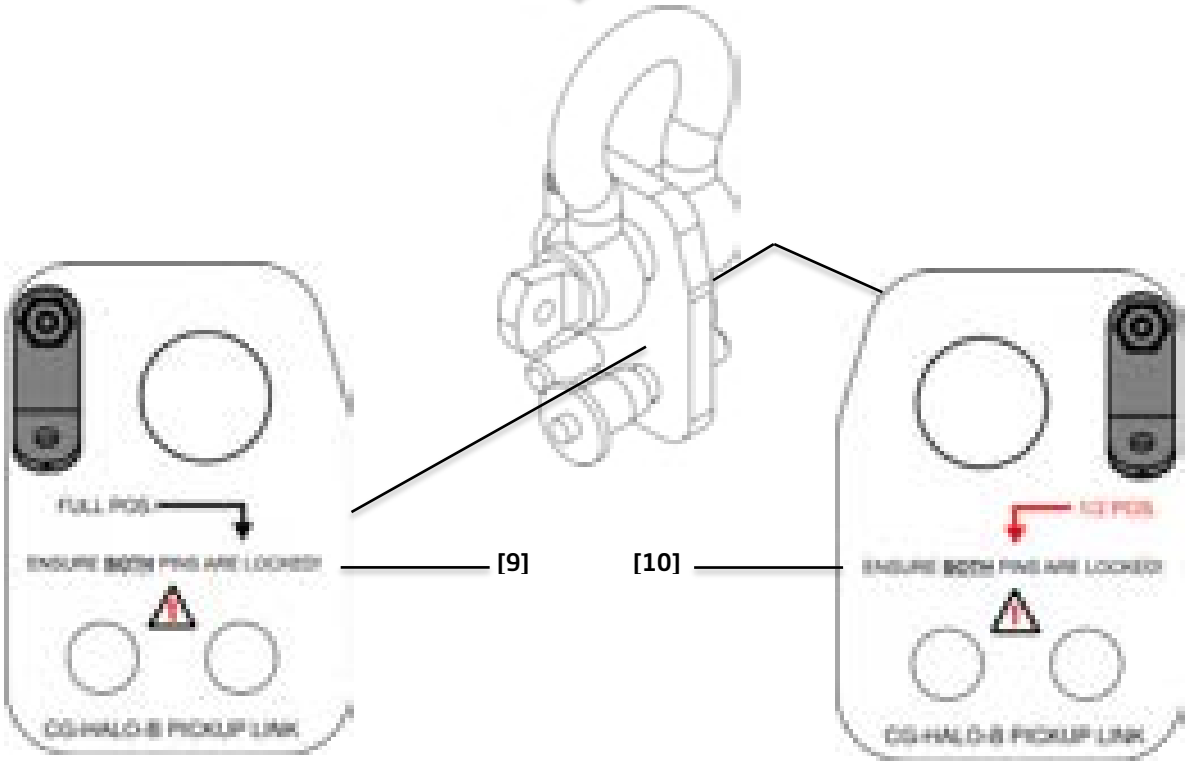

FULL POS
ENSURE BOTH PINS ARE LOCKED
CG-HALO-B PICKUP LINK
[9]
[10]
FULL POS
ENSURE BOTH PINS ARE LOCKED
CG-HALO-B PICKUP LINK

[1] – Front Link Attachment Point

This clevis forms the area where HALO-B enclosure front links should be engaged. A 0.313" ball-lock pin secures each link in place.

[2] – Splay Link Attachment Point

The splay link of the first HALO-B enclosure should engage in this slot in the spine. Pay attention to the label details with regards the indicated angle compared to actual angle for the first element in the array.

[3] – Cable Pick

The retractable cable pick gives a location to safely secure the array cables at the back of the FG-HALO-B grid. It can be stowed away when not being used.

[4] – Safety Points

A secondary safety must always be used on flown arrays. Both safety points should be connected to avoid the array swinging in the event of a primary lift failure. The SAFETY-HALO-B 2-leg bridle is designed for this purpose.

[5] – Inclinometer Mounting Point

A range of laser inclinometers can be fitted to the FG-HALO-B including TEQSAS devices. An aperture is provided in the front beam for the laser to pass

[6] – Inclinometer Laser Aperture

Opening in the front grid load member for the inclinometer laser beam to pass through.

[7] – Pickup Link Location Holes

Holes are numbered 1 to 22, the appropriate locations are determined by your EASE Focus simulation. Links must be secured with the two 0.375" ball-lock pins attached.

[8] – Pickup Links (Stowed)

Stow locations for the two pickup links when the FG-HALO-B is being used for ground stack, or being stored or transported.

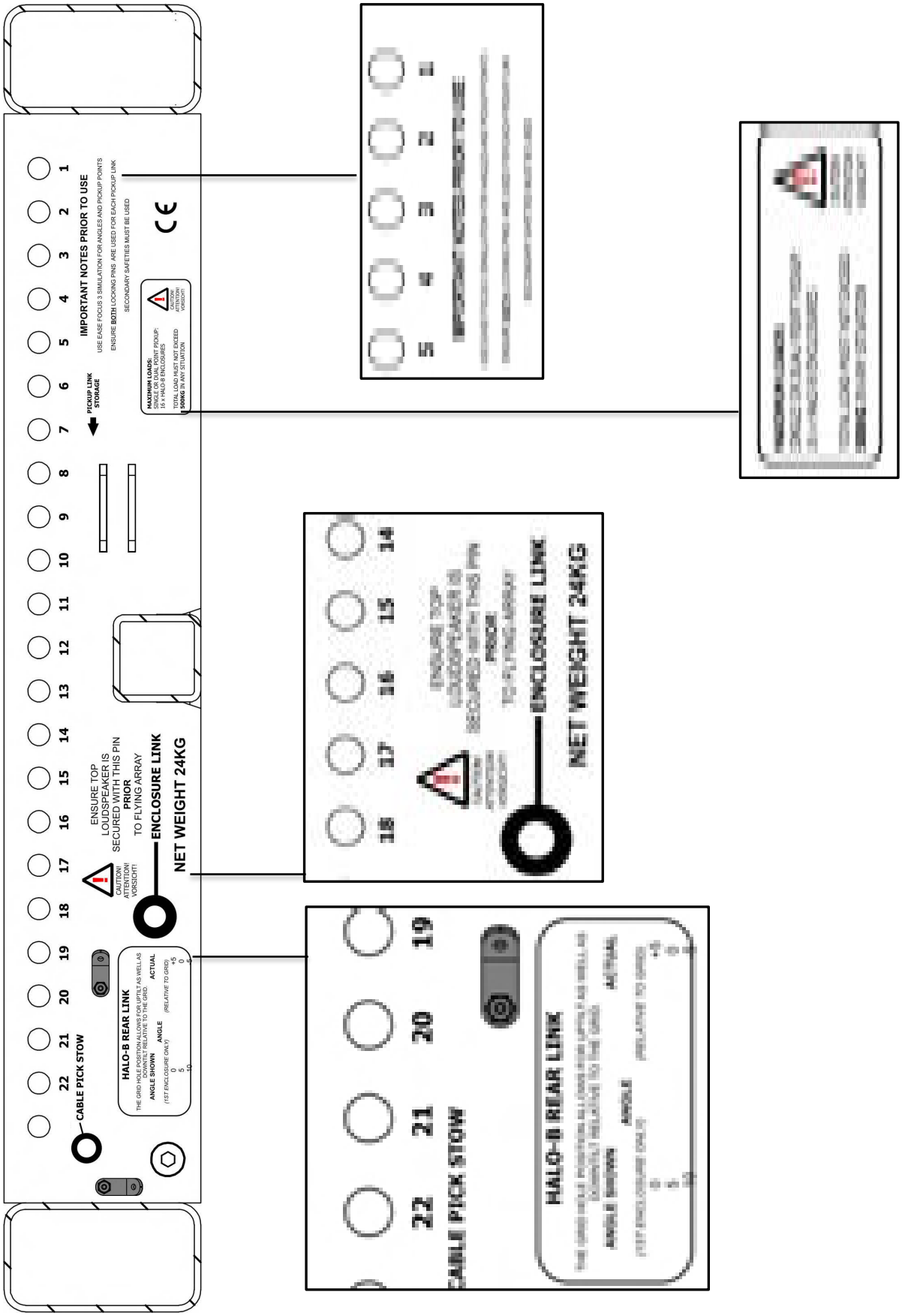
[9] – Pickup Links (Full Position)

When using a single pick point, reference Ease Focus 3 for the pick point for the desired angle. For a full position, line up the white arrow with the number on the spine

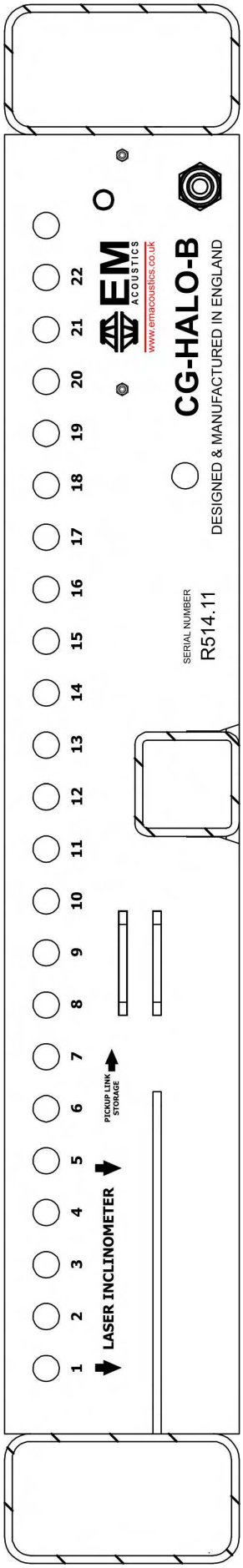
[10] – Pickup Links (Half Position)

When using a single pick point, reference Ease Focus 3 for the pick point for the desired angle. For a half position, line up the red arrow between the appropriate numbers on the spine

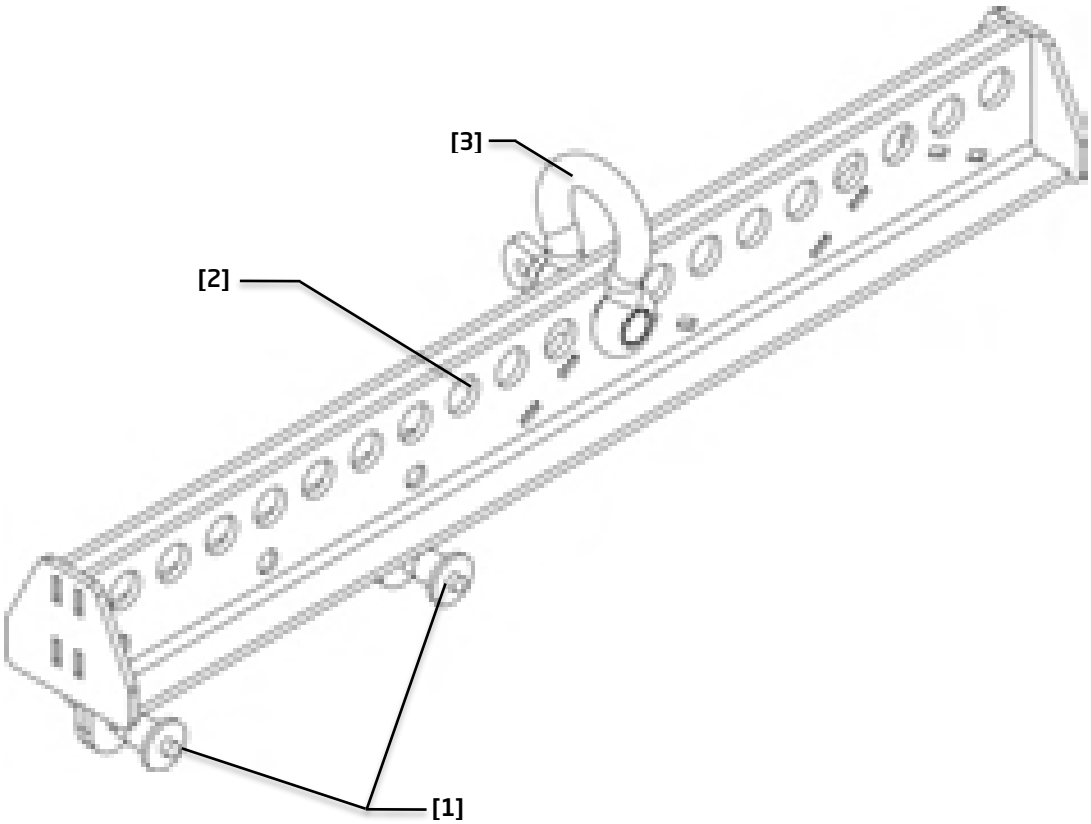
CG-HALO-B Instruction Label - Left side



CG-HALO-B Instruction Label - Right side



5.4 – EXT-HALO-B



[1] – Spine Attachment Point

These two lugs engage into the spine of the CG-HALO-B – either extending forward or back depending on the application. Two 0.375" ball-lock pins secure to the spine.

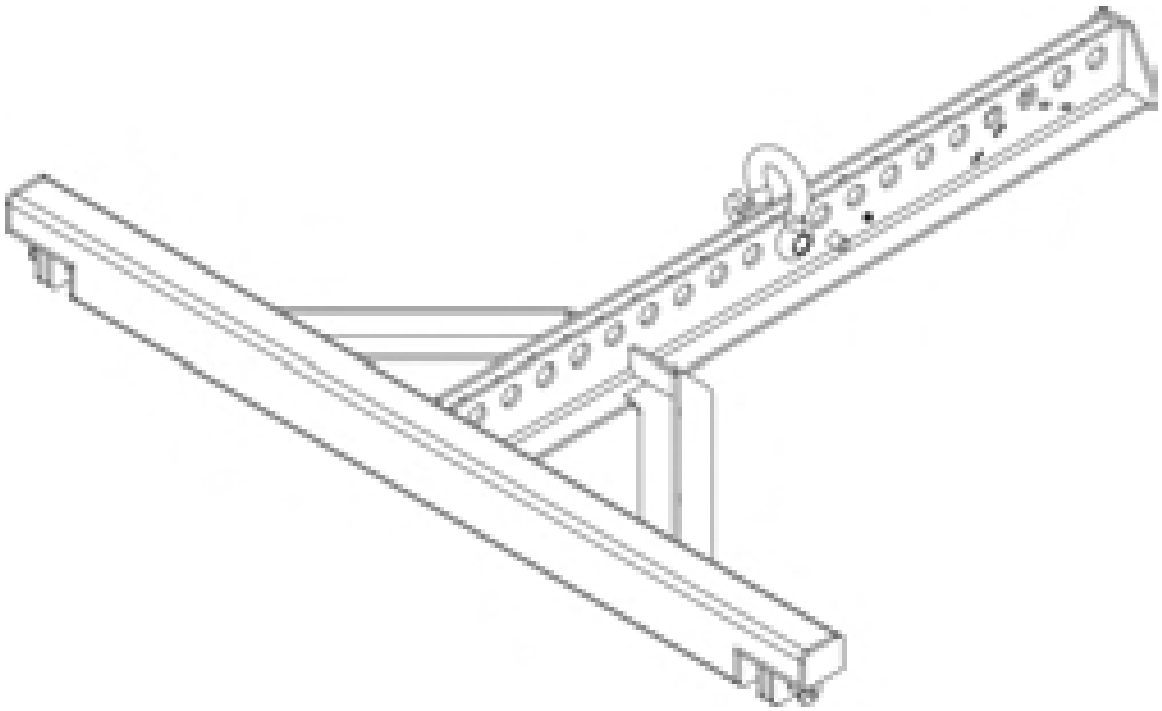
[2] – Pickup location holes

Holes are numbered 1 to 19, the appropriate locations are determined by your EASE Focus simulation. Links must be secured with the two 0.375" ball-lock pins attached.

[3] – 2-ton shackle

Use one or two 2-tonne shackles from the CG-HALO-B to suspend the array.

5.5 – SM-HALO-B



[1] – Front Link Attachment Point

This clevis forms the area where HALO-B enclosure front links should be engaged. A 0.313" ball-lock pin secures each link in place.

[2] – Splay Link Attachment Point

The splay link of the first HALO-B enclosure should engage in this slot in the spine. Pay attention to the label details with regards the indicated angle compared to actual angle for the first element in the array.

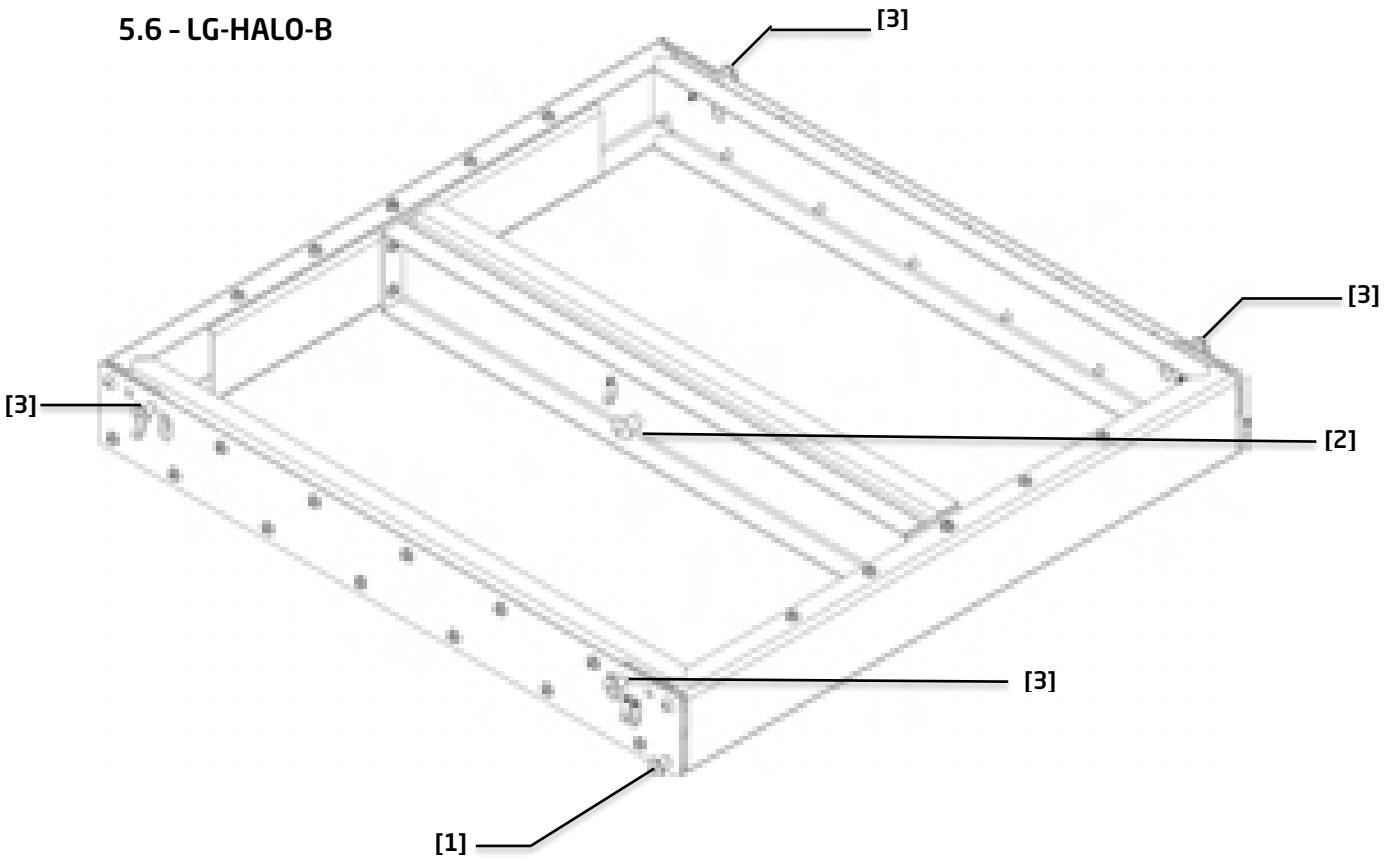
[3] – Pickup Location Holes

Holes are numbered 1 to 19, the appropriate locations are determined by your EASE Focus simulation. Links must be secured with the two 0.375" ball-lock pins attached.

[4] – 2-ton shackle

The SM-HALO-B is supplied with a single 2-ton bow shackle for suspension.

5.6 - LG-HALO-B



[1] - Front Link Attachment Point

This clevis forms the area where HALO-B enclosure front links should be engaged. A 0.313" ball-lock pin secures each link in place.

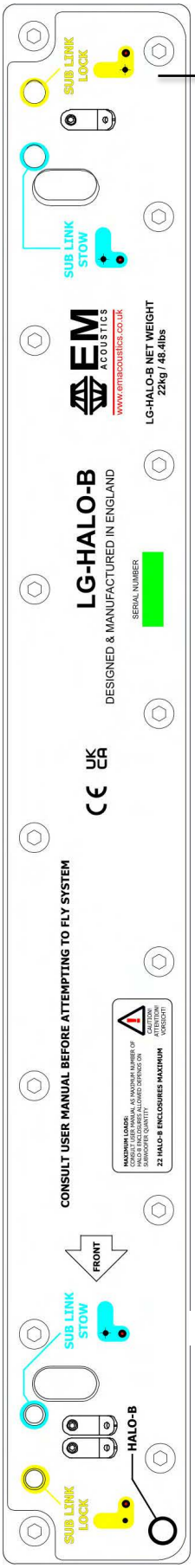
[2] - Splay Link Attachment Point

The splay link of the first HALO-B enclosure should engage in this slot in the spine. Pay attention to the label details with regards the indicated angle compared to actual angle for the first element in the array.

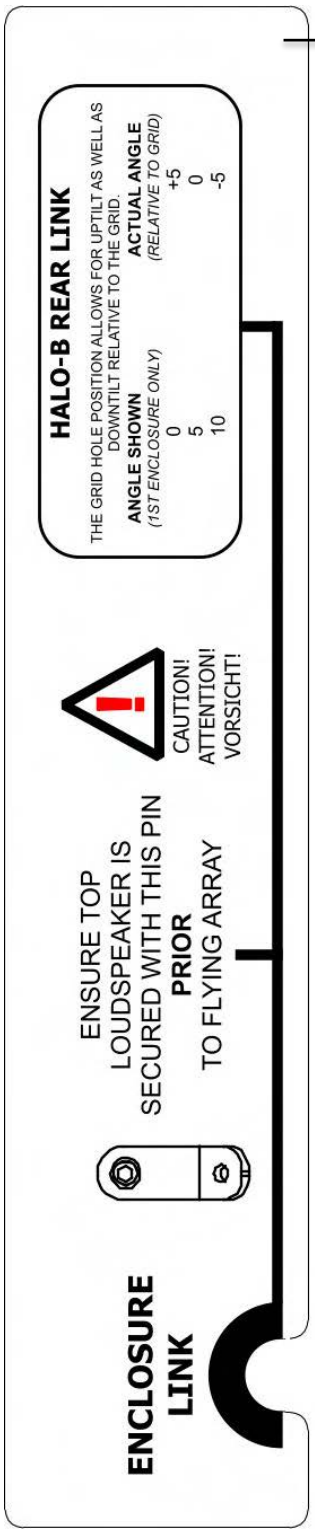
[3] - Subwoofer Attachment Point

These points with their captive links are used to secure the LG-HALO-B to the bottom of an ST-215 subwoofer. The captive links in these four locations should be rotated to be visible, and locked in place prior to use.

LG-HALO-B Instruction Labels

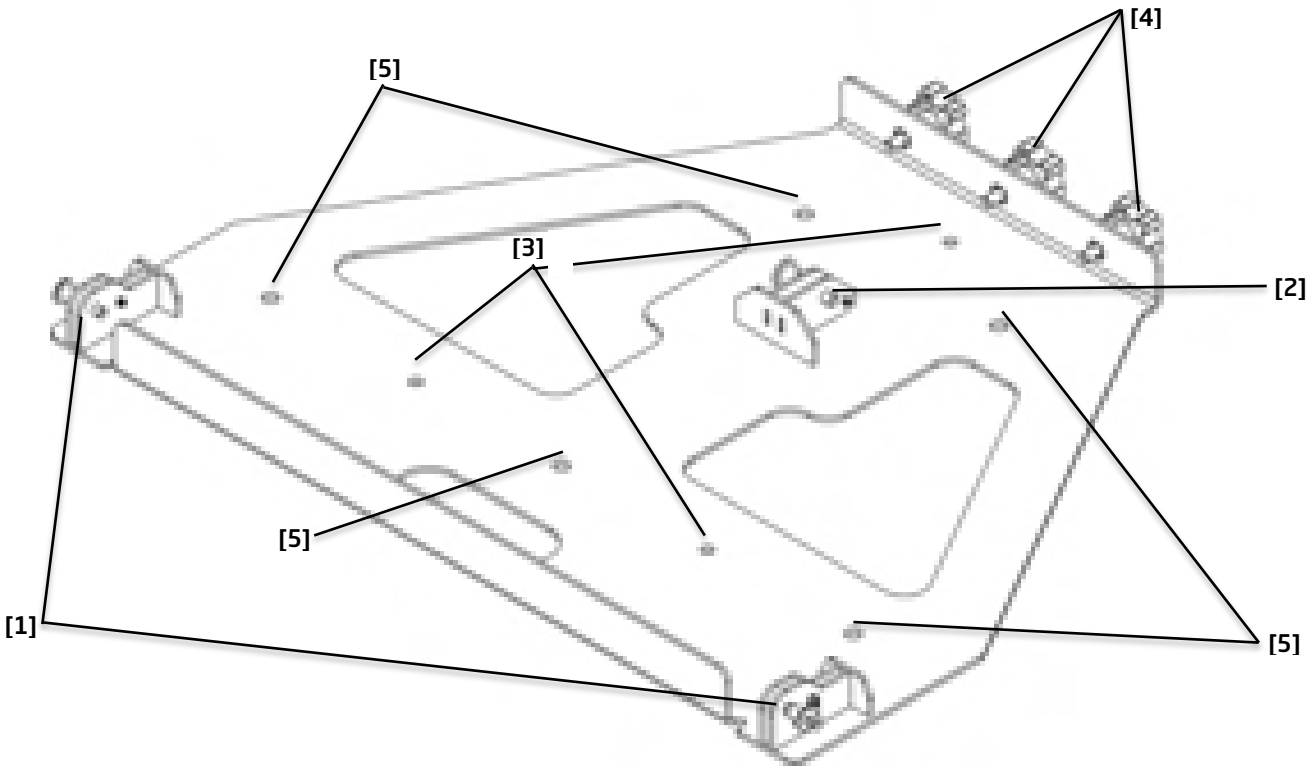


Outer label



Spine label

5.7 - GS-HALO-B



[1] – Front Link Attachment Point

This clevis forms the area where HALO-B enclosure front links should be engaged. A 0.313" ball-lock pin secures each link in place.

[2] – Splay Link Attachment Point

The splay link of the first HALO-B enclosure should engage in this slot in the spine. Pay attention to the label details with regards the indicated angle compared to actual angle for the first element in the array.

[3] – ST-215 Attachment Point

Three M8 clearance holes are provided in the GS-HALO-B surface to secure it to an ST-215 subwoofer in ground stack use. Use the three supplied M8 lobe

[4] – M8 lobe knob

Three M8 lobe knobs to secure to an ST-215. These knobs are stowed in the captive threaded bushes at the rear of the GS-HALO-B.

[5] – Installation Points

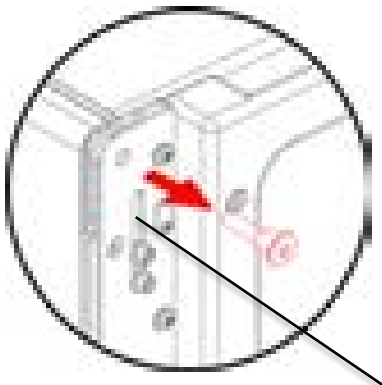
For permanent installation, five 11mm diameter mounting holes are provided in the GS-HALO-B surface.

6.0 – System Setup

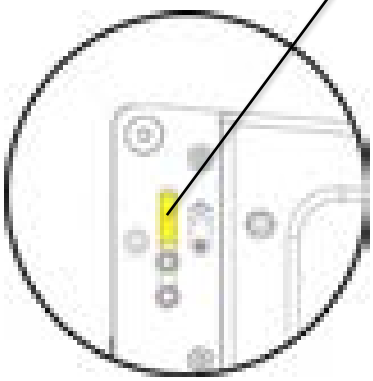
6.1 – Preparing HALO-B for flying or stacking

6.1.1 – Linking the front Rigging System

Step 1.

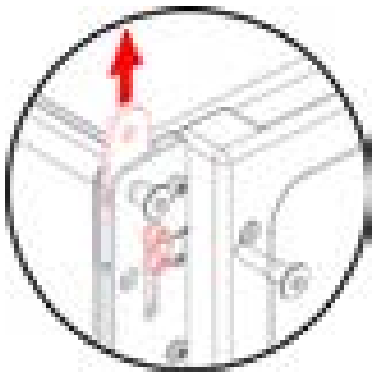


Remove the Front Link Lock pin from the top of the front rigging



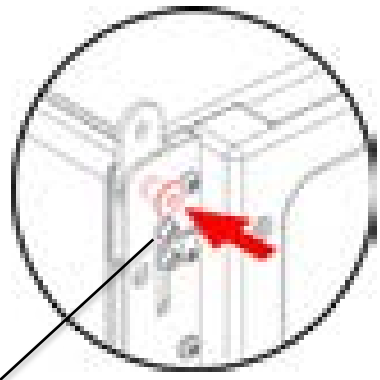
Safety label visible when link is retracted

Step 2.

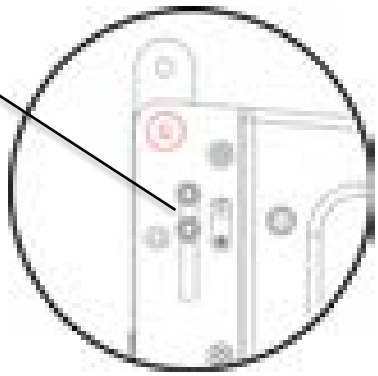


Extend front

Step 3.



Insert the Front Link Lock pin to lock link in place



Safety label hidden when link is correctly rigged

6.1.2 – Splay lock pin storage

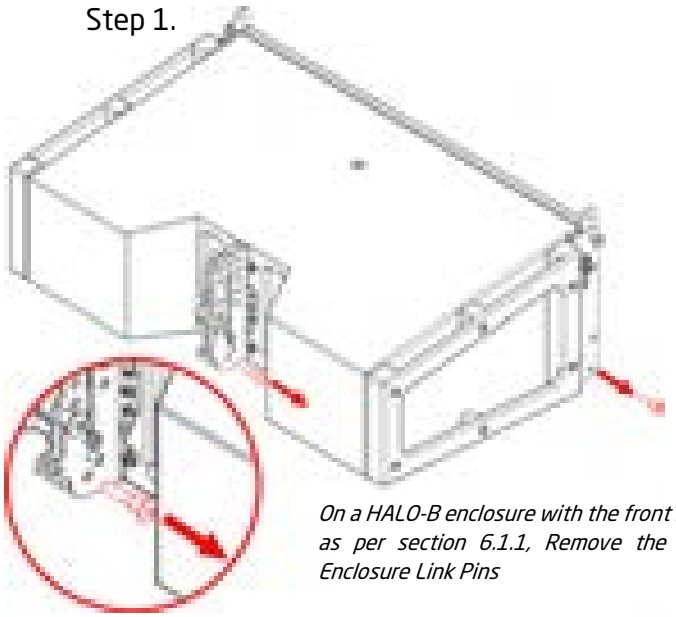
*When removing the Splay Lock Pin for **derigging** the array only, be sure to use the storage position on the rear of the splay rigging assembly. This ensures that the pin does not get in the way or get trapped between elements as the array moves.*

The pin in this location does however prevent the splay link from having a complete range of movement, so do not use this location when setting angles prior to flying the array – just leave the pin hanging on its lanyard.

6.2 - Flying HALO-B systems

6.2.1 - Prepping HALO-B on WC-HALO-B

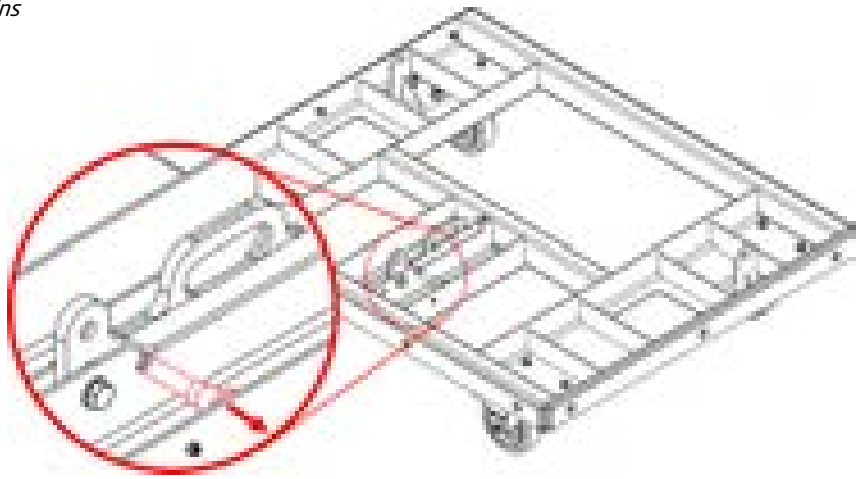
Step 1.



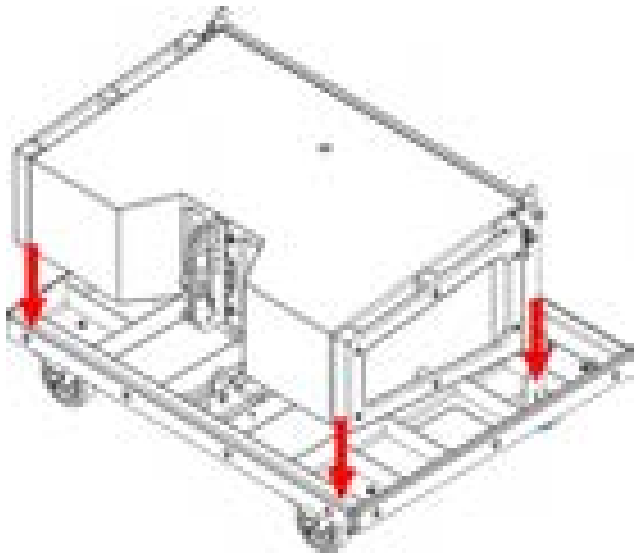
On a HALO-B enclosure with the front rigging extended as per section 6.1.1, Remove the Front and Rear Enclosure Link Pins

Step 2.

Remove the WC-HALO-B Rear Link Pin. (Leave the link in the stowed transit position)



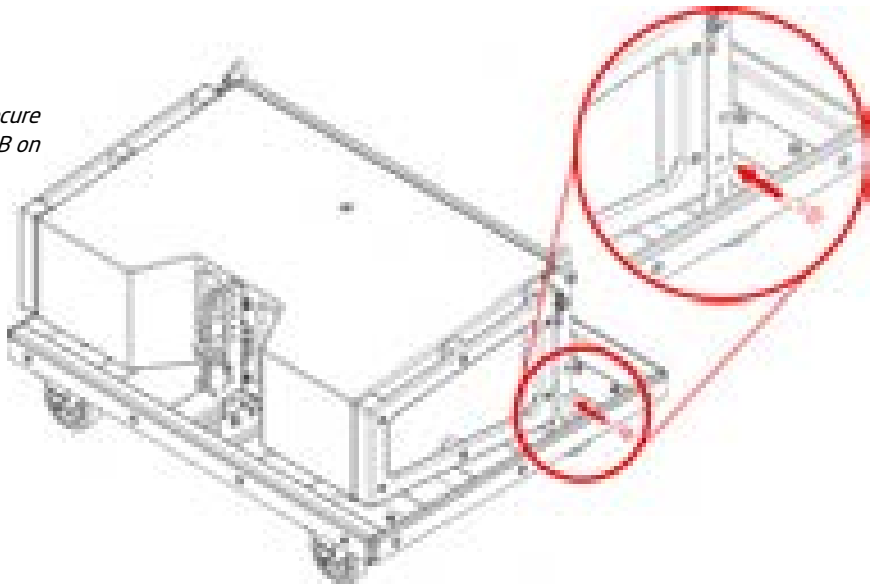
Step 3.



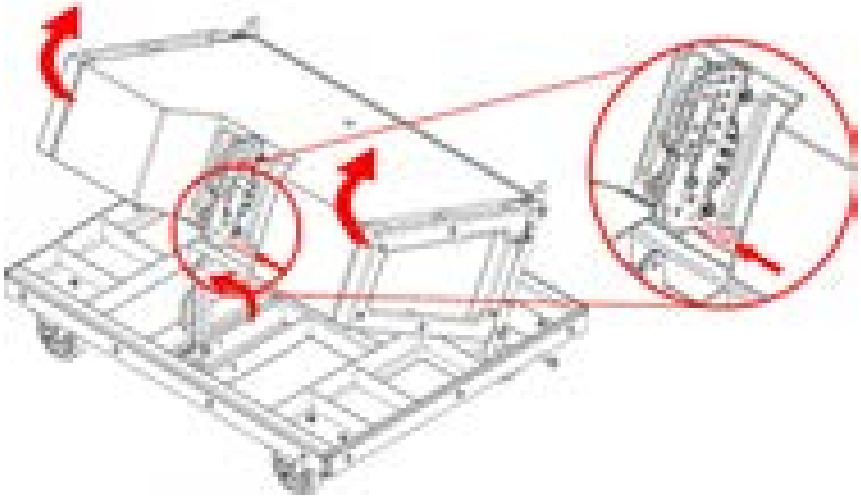
Lower first enclosure onto WC-HALO-B and locate on the front links.

Step 4.

Replace the Front Enclosure Link Pins to secure the front of the HALO-B to the WC-HALO-B on both sides of the wheelcart.

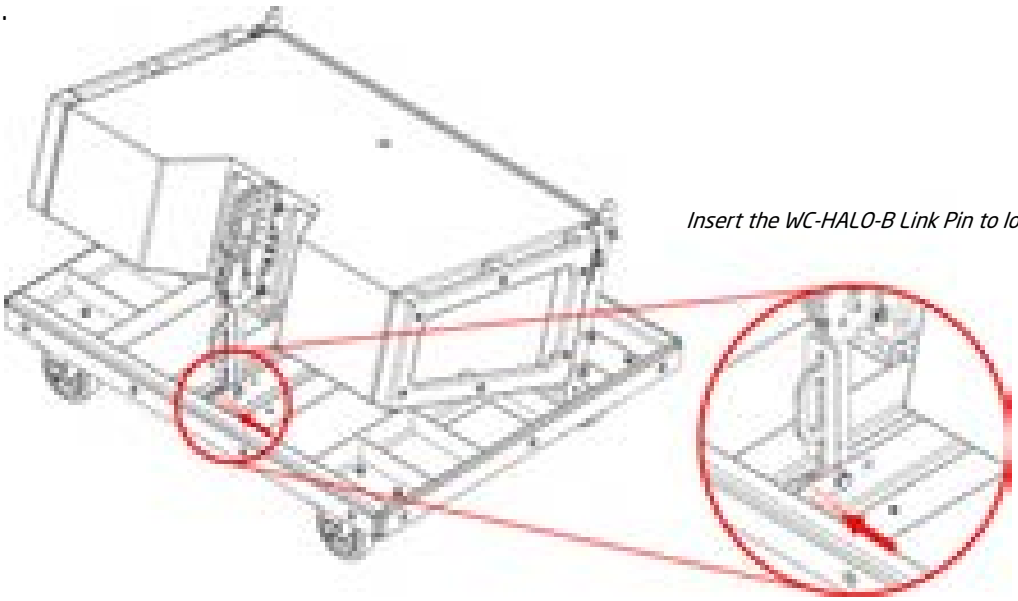


Step 5.



Lift the rear of the enclosure. Rotate the WC-HALO-B Rear link so it inserts into the receptacle on the HALO-B splay rigging. Insert Rear Enclosure Link pin on HALO-B to lock in place.

Step 6.



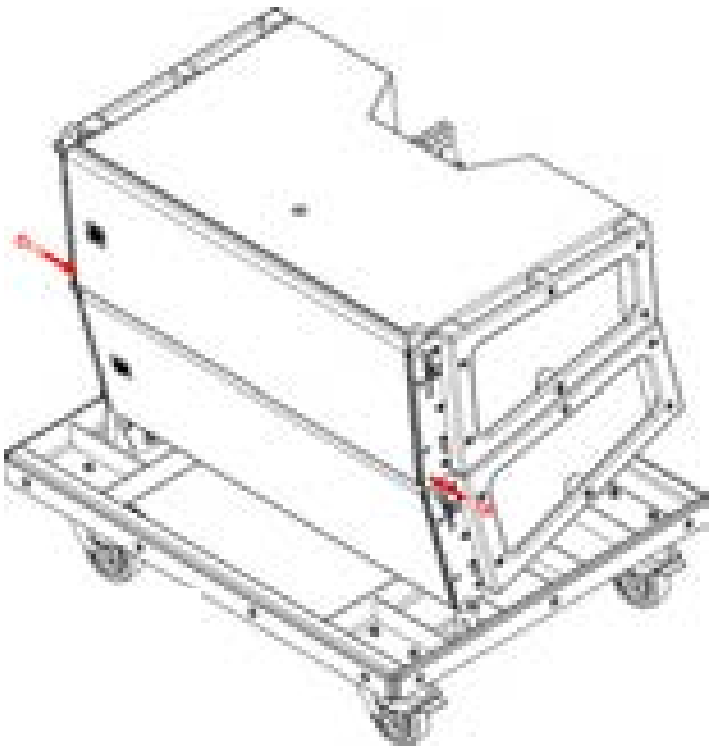
Insert the WC-HALO-B Link Pin to lock in the upright position.

Step 7.

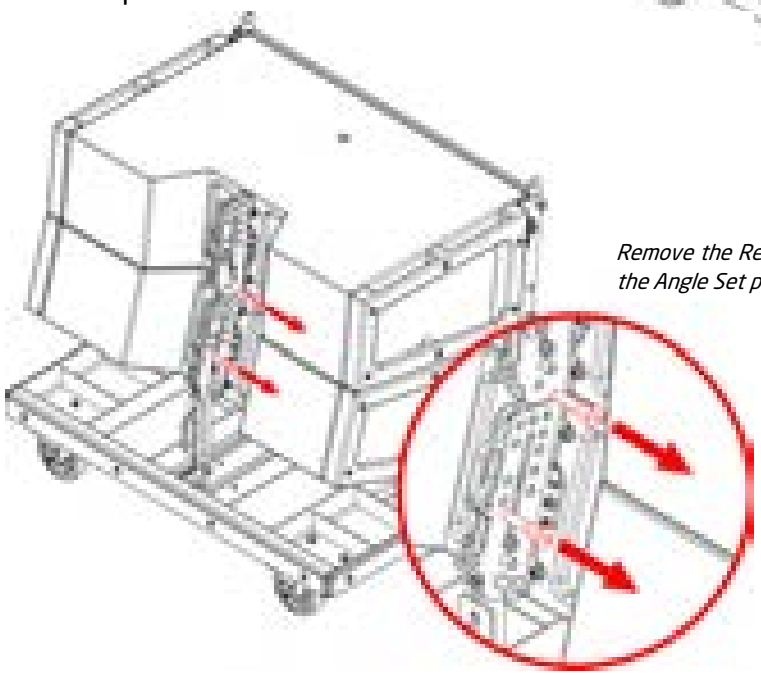
Prepare the next enclosure as above. Position the second HALO-B above the first, and lower into position so that the front links fit into the receptacles on the second (upper) HALO-B enclosure.

Step 8.

Insert the Front Enclosure Link pins on both sides to secure the fronts of the enclosures together.



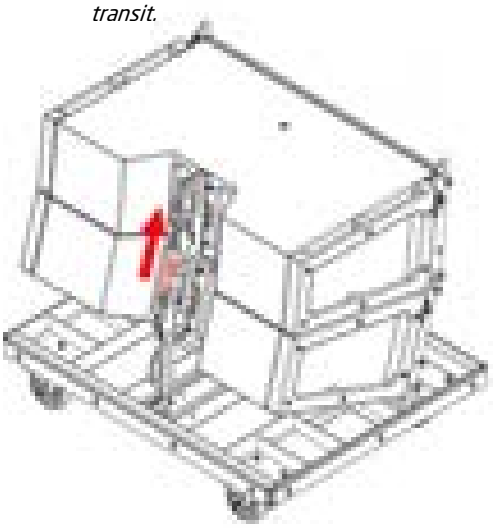
Step 9.

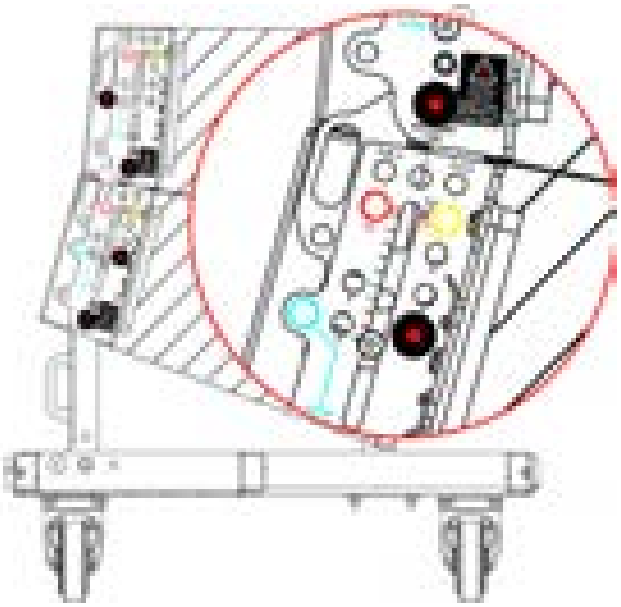


Remove the Rear Enclosure Link pin from the upper HALO-B and the Angle Set pin from the lower HALO-B.

Step 10.

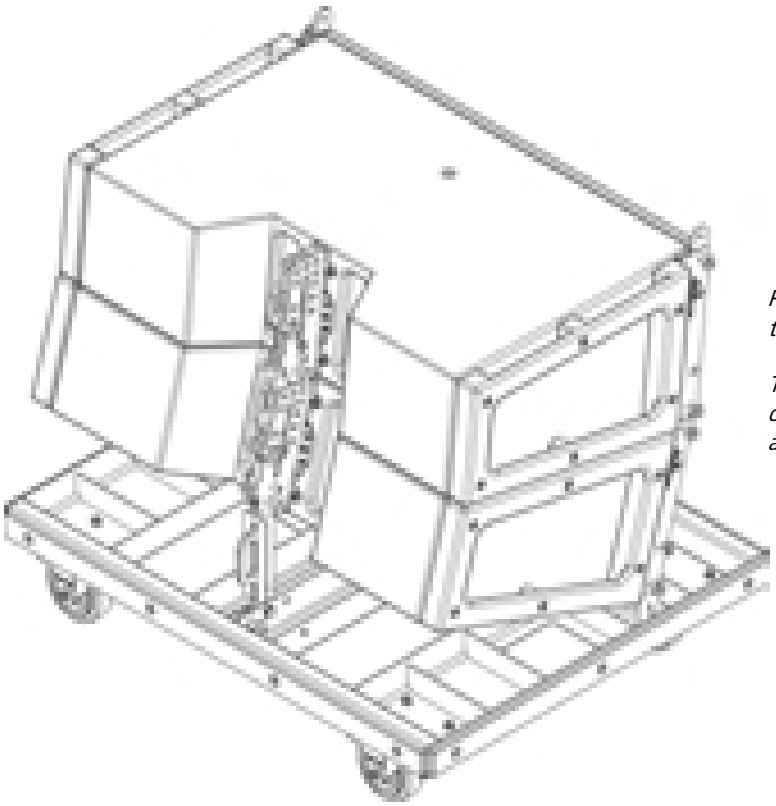
Slide the Splay Link on the lower HALO-B to the 10-degree position, and re-insert the Angle Set pin and the Rear Enclosure Link pin to lock the enclosures firmly together for transit.





Ensure angle set pin is engaged in the 10-degree hole to prevent the stack opening up in transit.

Step 11.

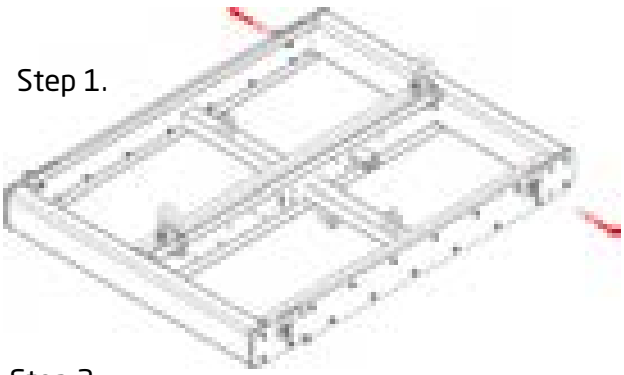


Repeat steps 7-10 to add further HALO-B enclosures up to a maximum of four per WC-HALO-B.

The optional TC-HALO-B padded transit cover fits over completed WC-HALO-B with four enclosures to add additional protection during transit.

6.2.2 - Flying from WC-HALO-B with FG-HALO-B

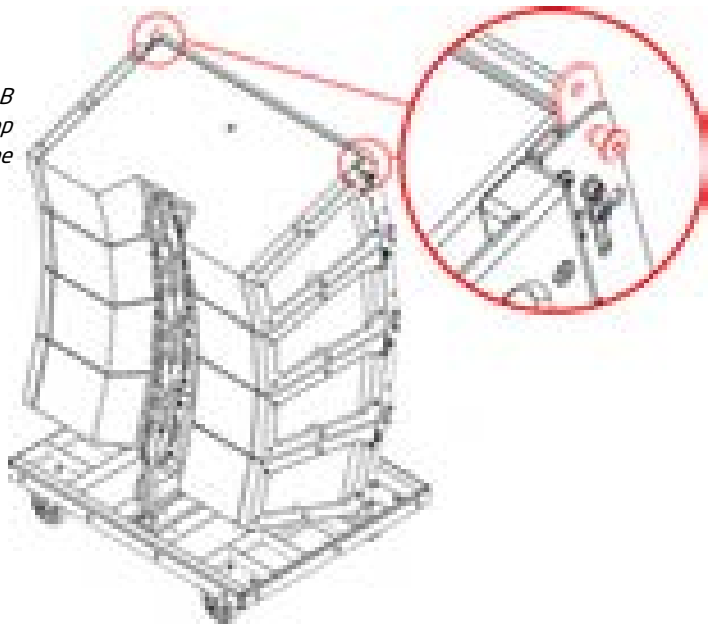
Step 1.



Prepare an FG-HALO-B master grid by positioning the pickup links at the desired locations (according to your EASE Focus simulation) and removing the Front Link Attachment pins.

Step 2.

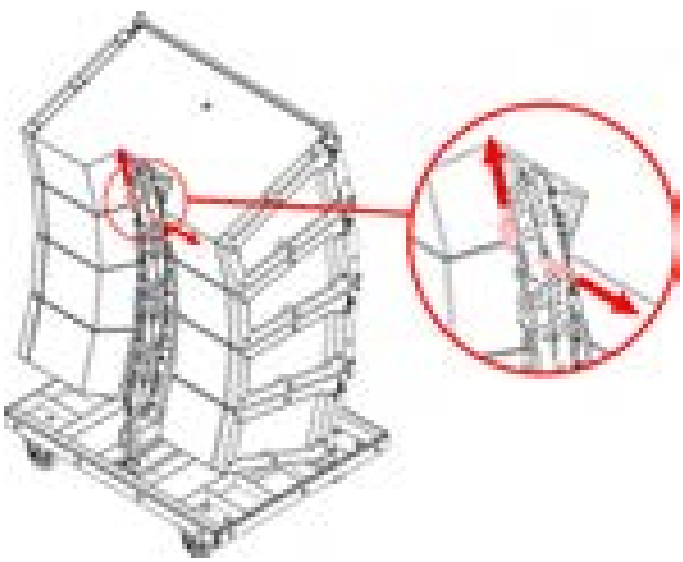
Prepare the first WC-HALO-B of four HALO-B enclosures. Extend the front links of the top element - ensure to lock them in place with the Front Link Lock pins on both sides.

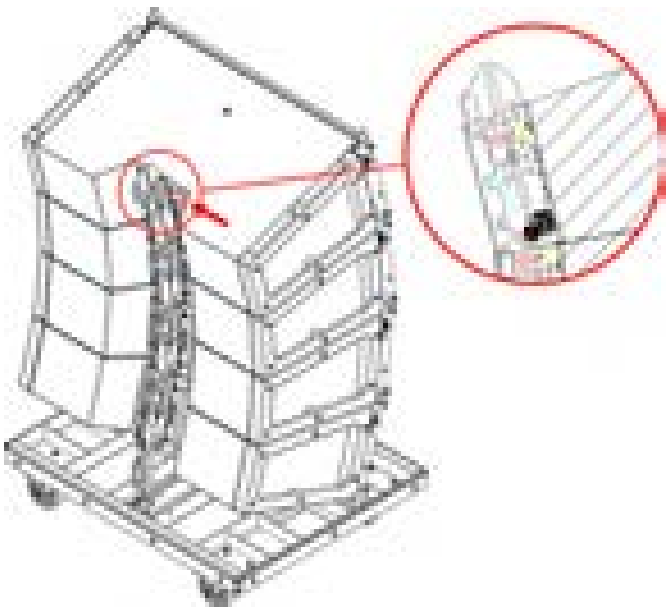


Step 3.

Remove the Angle Set pin on the first HALO-B element and extend the rear link to select the desired angle according to your EASE Focus simulation. Pay particular attention to the grid label legend which describes the difference between indicated angle and actual angle of the first element in the array.

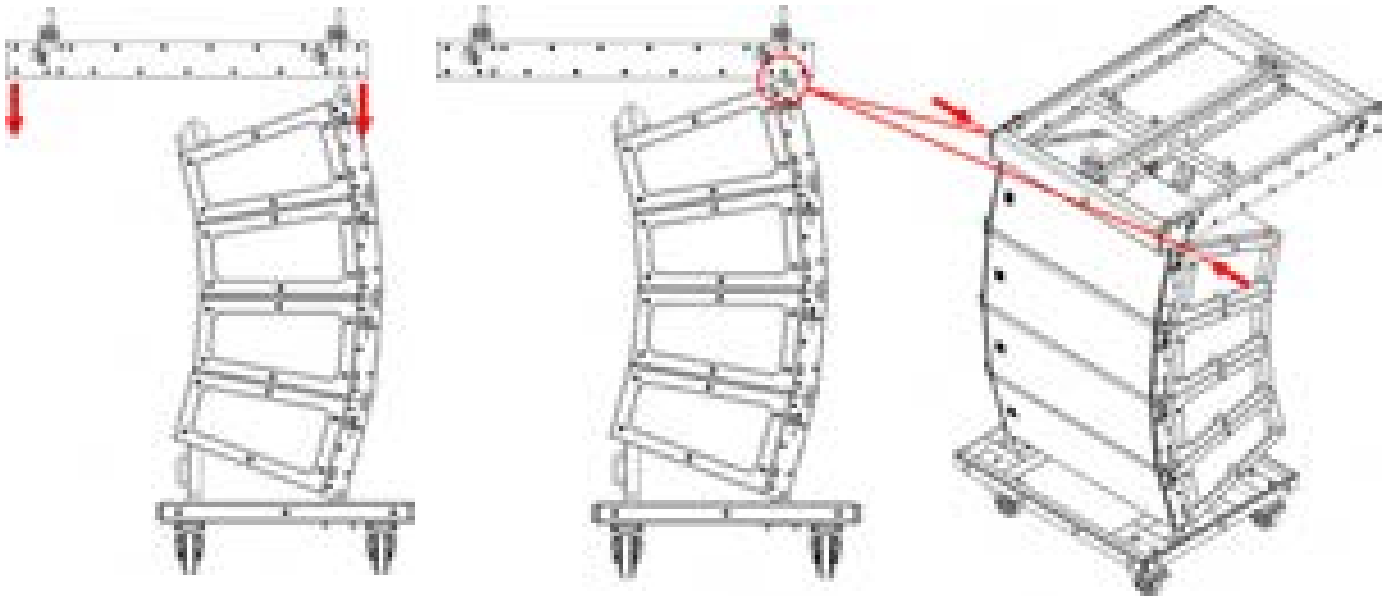
Remove the Splay Link Attachment pin from its location in the spine of the FG-HALO-B.





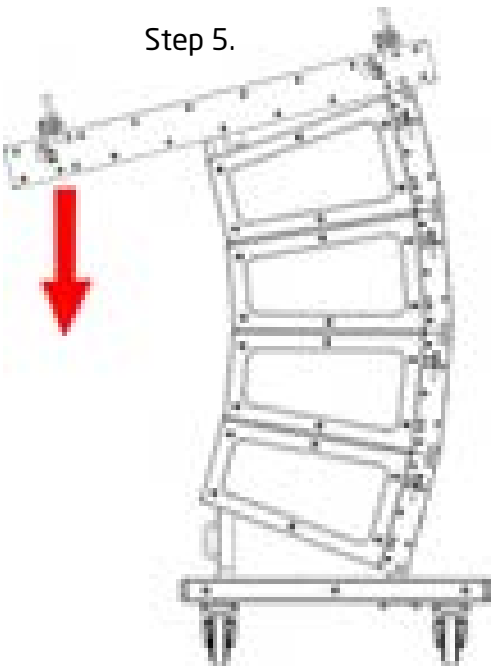
Step 4.

Position the FG-HALO-B correctly above the HALO-B enclosures, and lower into place.

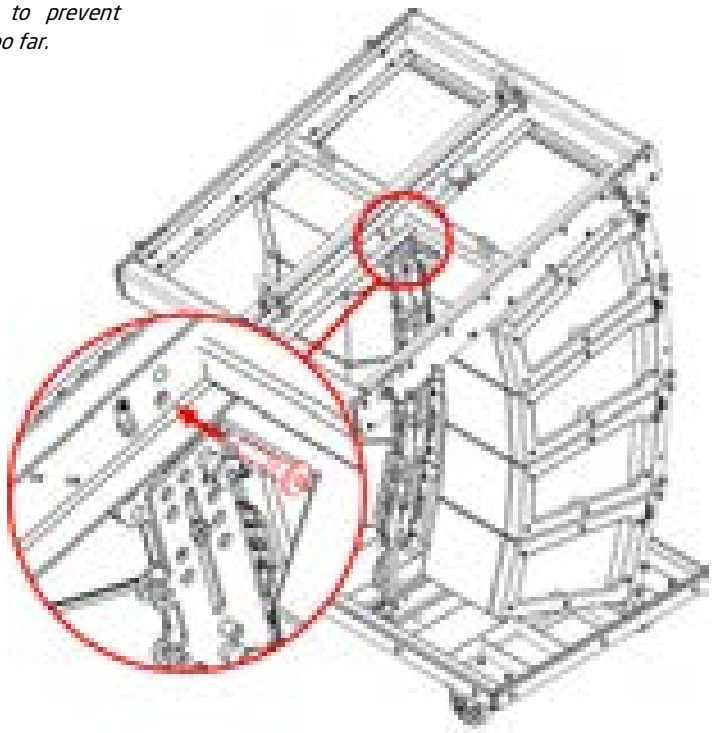


Ensure the front links are engaged in the clevis on each side of the FG-HALO-B, and securely connect the grid to the first element by reinstating the Front Link Attachment pins on both sides

Step 5.



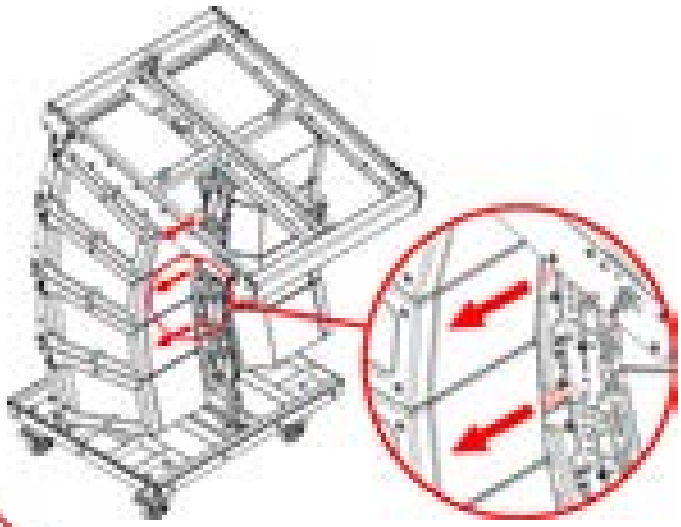
Lower the rear of the FG-HALO-B grid so that the enclosure link hole lines up with the splay link on the first HALO-B element. There is a stop inside the FG-HALO-B spine to prevent you lowering too far.

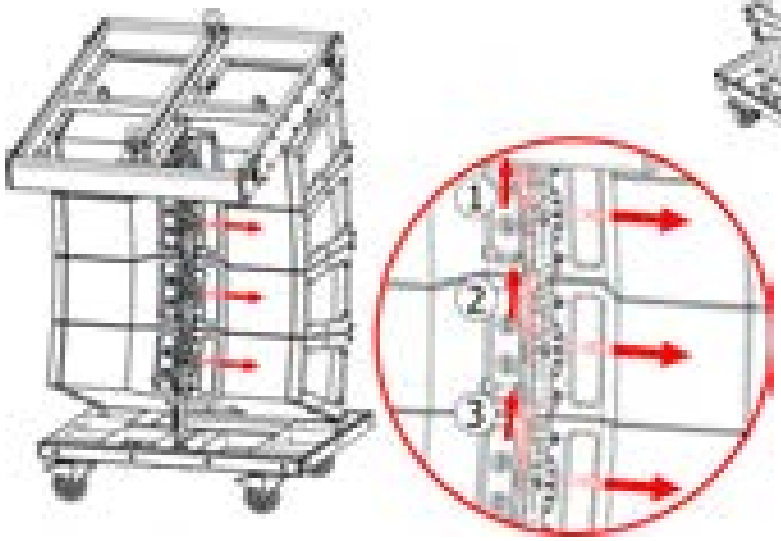


Insert the Splay Link Attachment pin back into its location on the grid spine, thereby securely attaching the FG-HALO-B to the stack of HALO-B elements.

Step 6.

Remove all the Splay Lock pins from the top three elements on the wheelcart.

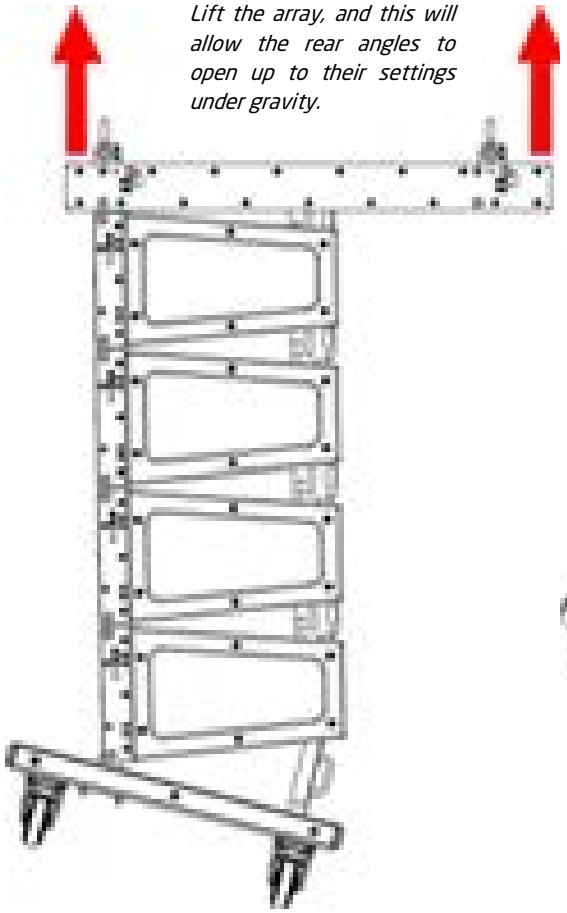


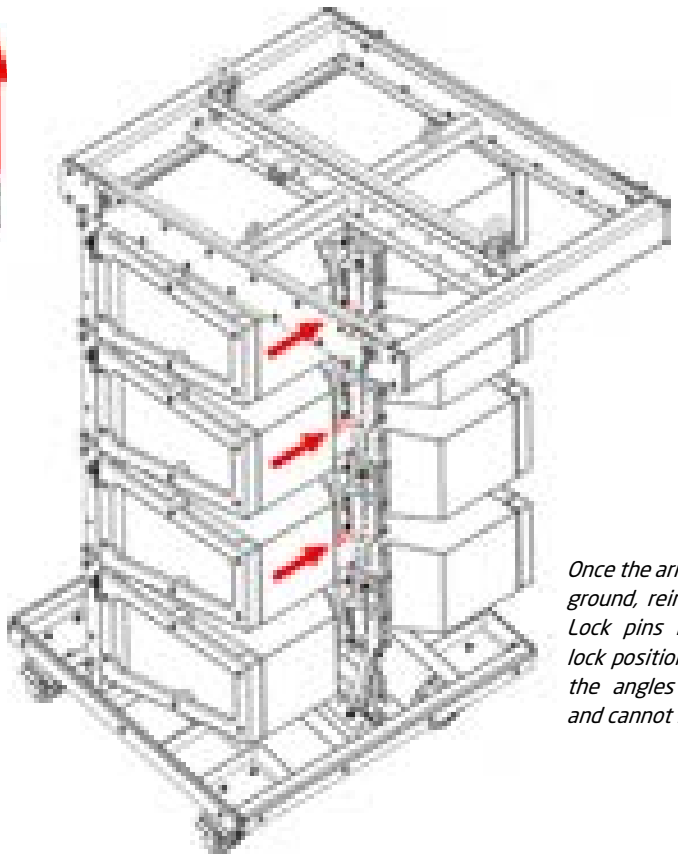


Starting from the 2nd element in the stack and working down to the bottom, remove the Angle Set pin and move the splay link to the desired angle as determined by your EASE Focus 3 simulation. Replace the Angle Set pin for each enclosure into the desired hole to set the angle. Continue this procedure for the 3rd and 4th elements in the stack.

Step 7.

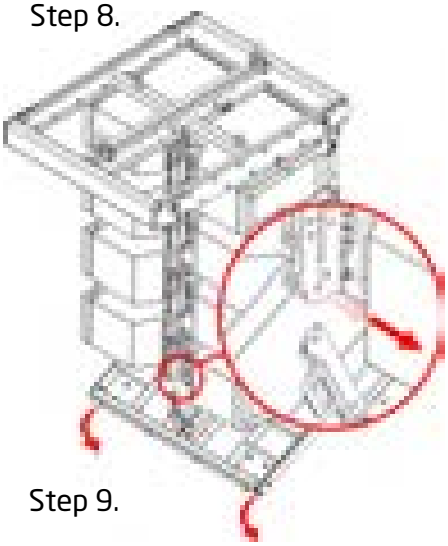
Lift the array, and this will allow the rear angles to open up to their settings under gravity.





Once the array is clear of the ground, reinstate the Splay Lock pins into their splay lock positions - this ensures the angles are now fixed and cannot move.

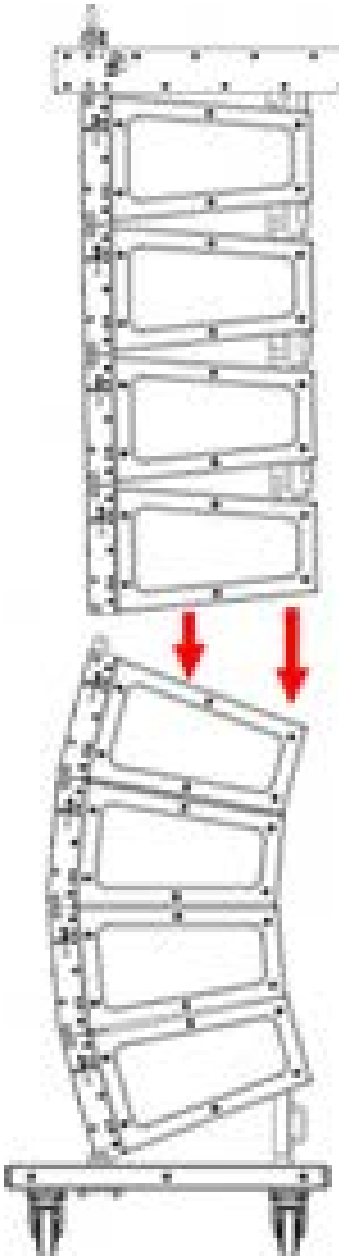
Step 8.



Holding the rear of the wheelcart, remove the Rear Enclosure Link pin from the bottom element of the array so that the wheelcart is released. Gently lower it to the floor.

Now, holding the front of the wheelcart, remove the Front Enclosure Link pins on both sides to remove the wheelcart entirely. Lower it to the floor and set aside.

Step 9.

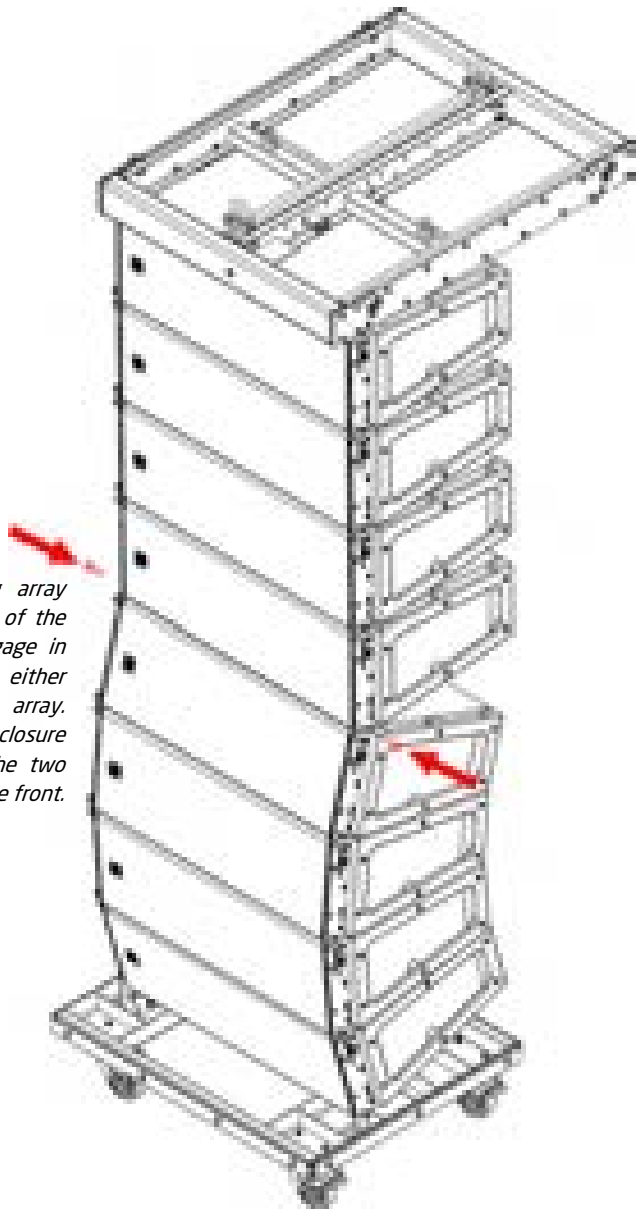


Prepare a second wheelcart of HALO-B and move it into position under the first four.

Ensure front links are extended and locked in place, but the splay link is retracted for the time being.

Repeat the procedure detailed above to set the required angles on the elements of the new stack except the top one, starting from the 2nd element and working down.

Lower the hanging array until the front links of the additional stack engage in the receptacles on either side of the flown array. Reinsert the Front Enclosure Link pins to lock the two blocks together at the front.



Step 10.

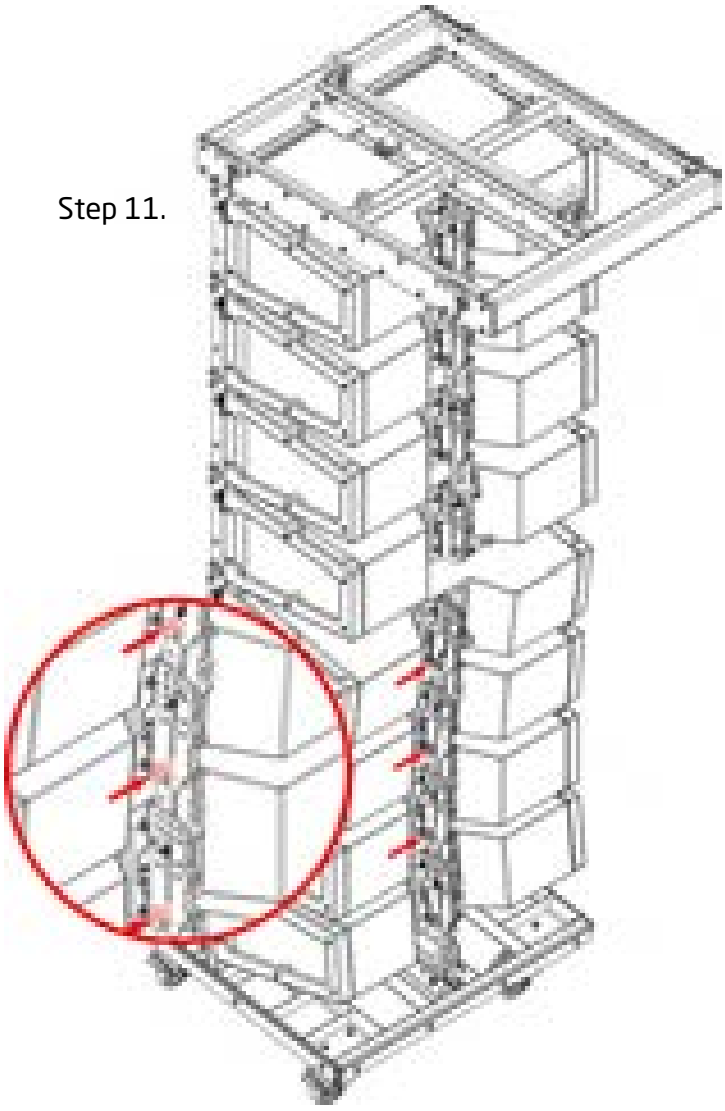
Lift the array.

The lower four enclosures will swing forwards, so pay close attention to where other team members are located when lifting.

As the lower four leave the ground, their angles will open out as before.

CAUTION!
Array will swing forwards

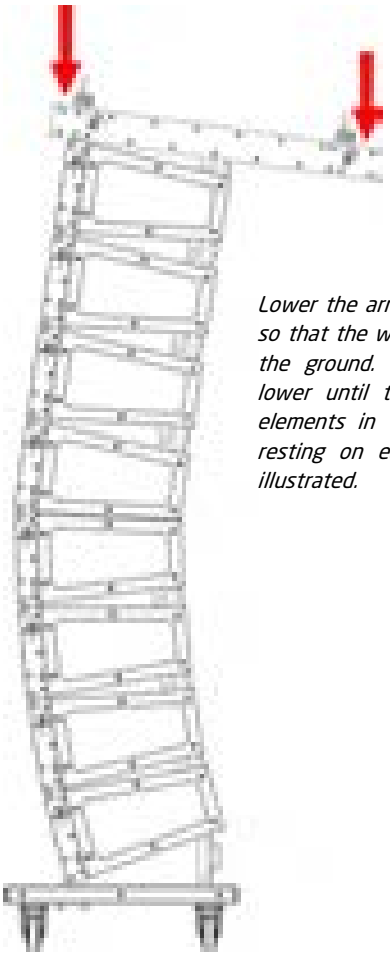
Step 11.



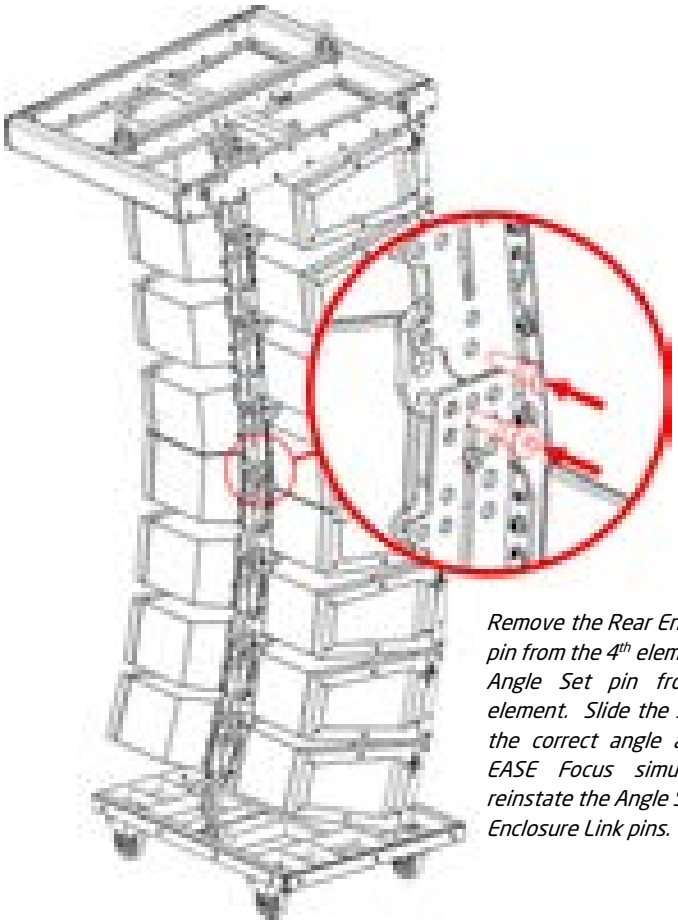
Once the lower four elements are clear of the ground and are hanging, reinstate the Splay Lock pins into their use locations as above. This will lock the angles of the bottom four enclosures.

Be aware, the splay link on the first element of the lower four should remain retracted at this point.

Step 12.



Lower the array once more so that the wheelcart is on the ground. Continue to lower until the 4th & 5th elements in the array are resting on each other as illustrated.

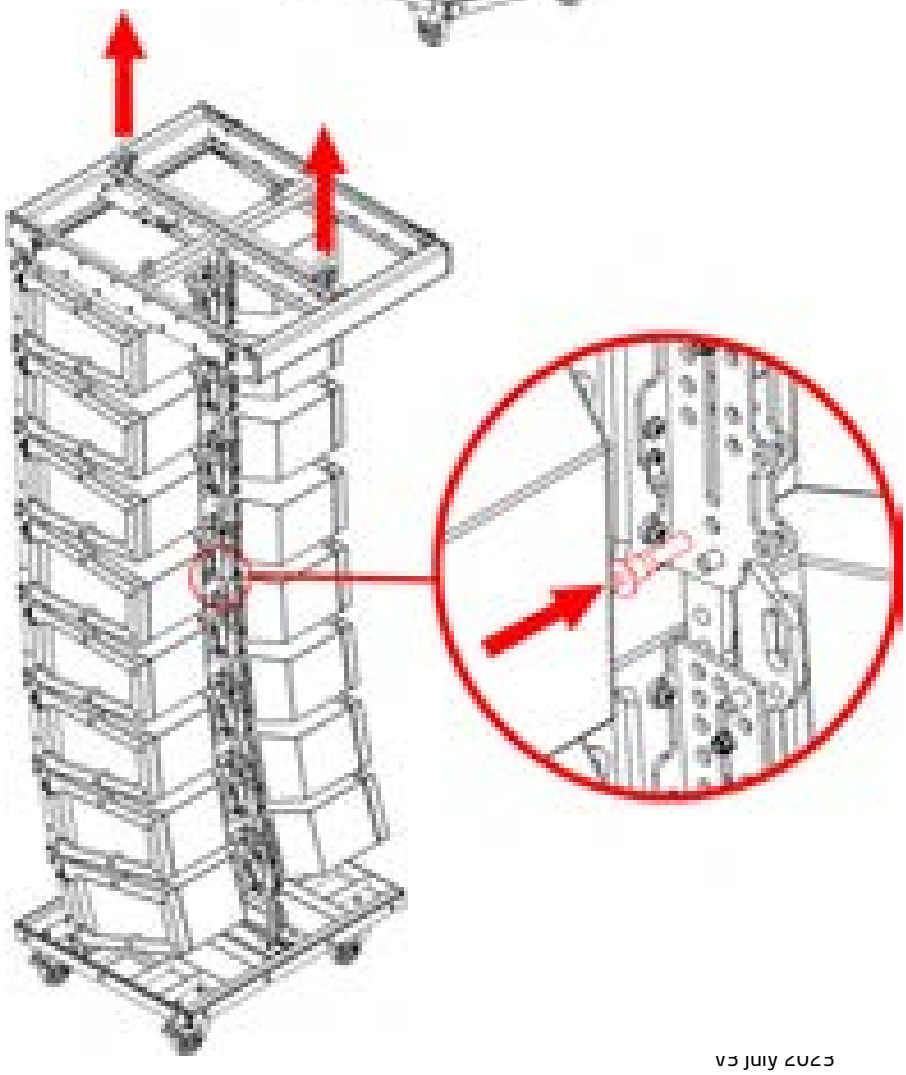


Remove the Rear Enclosure Link pin from the 4th element, and the Angle Set pin from the 5th element. Slide the splay link to the correct angle as per your EASE Focus simulation, and reinstate the Angle Set and Rear Enclosure Link pins.

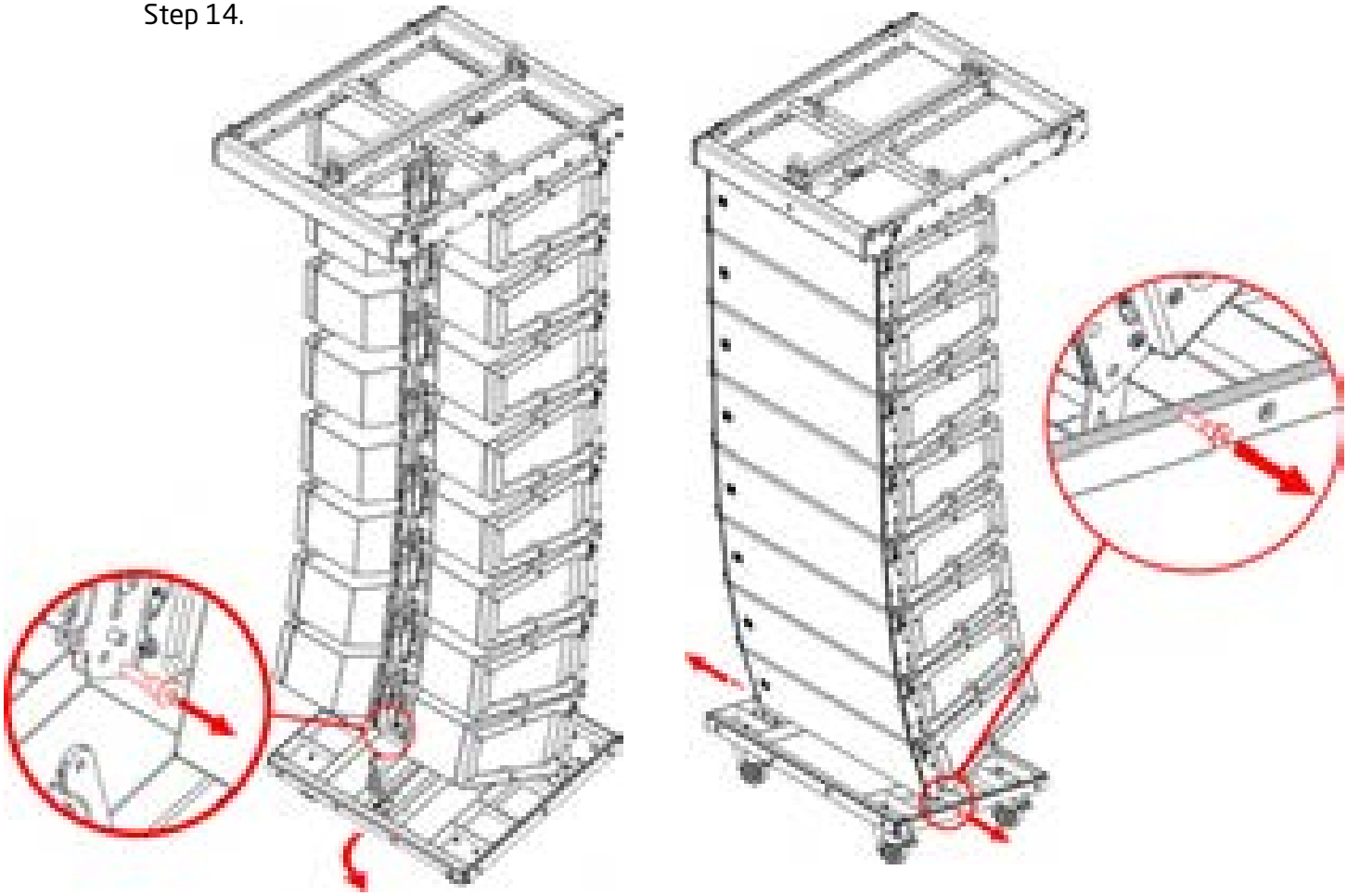
Step 13.

Lift the array clear of the floor once again. The angle between the 4th and 5th elements will now open up, and the array will hang as intended by the angles you have set.

Once it is hanging, move the Splay Lock pin on the 4th element from its stow location to its use location to secure the whole array.



Step 14.



Holding the rear of the wheelcart, remove the Rear Enclosure Link pin from the bottom element of the array so that the wheelcart is released. Gently lower it to the floor.

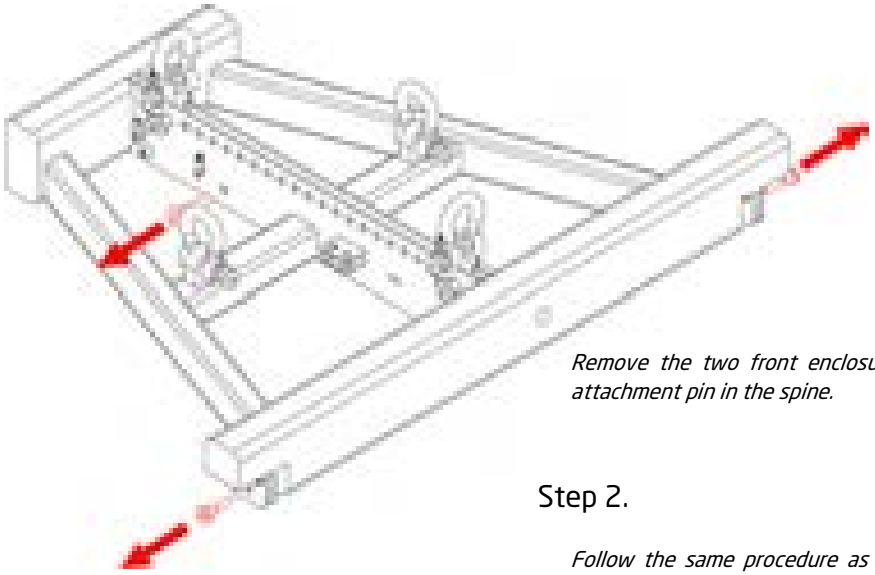
Now, holding the front of the wheelcart, remove the Front Enclosure Link pins on both sides to remove the wheelcart entirely. Lower it to the floor and set aside.

Step 15.

Repeat steps 9 to 14 again to continue to assemble the array according to your simulation - up to a maximum of 24 elements.

6.2.3 - Flying from WC-HALO-B with CG-HALO-B

Step 1.



Remove the two front enclosure link pins, and the splay link attachment pin in the spine.

Step 2.

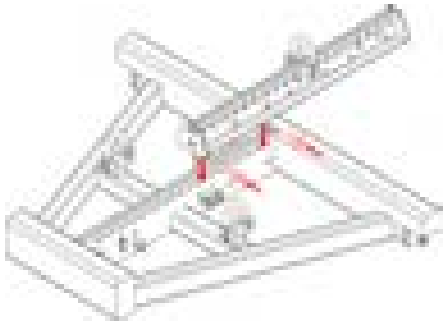
Follow the same procedure as outlined within section 6.2.2 to attach to HALO-B enclosures.

IMPORTANT NOTE:

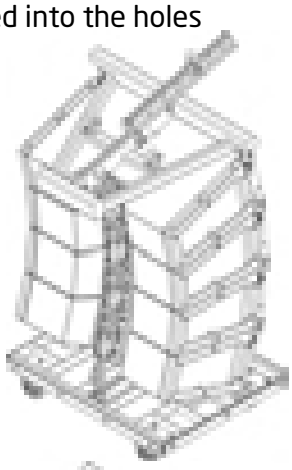
CG-HALO-B ACCESSORIES CAN BE USED TO SUSPEND A MAXIMUM OF 16 ENCLOSURES IN A FLOWN CONFIGURATION

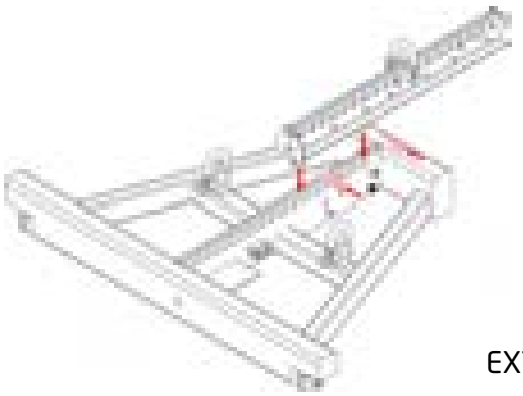
6.2.4 – Using the EXT-HALO-B extension bar

The EXT-HALO-B extension bar is for use with the CG-HALO-B grid where more extreme up or down-tilt angles are required. The EXT-HALO-B can be fitted to extend out the front of the CG-HALO-B (for uptilt) or the back (for down-tilt) and should be fitted into the holes as shown below.

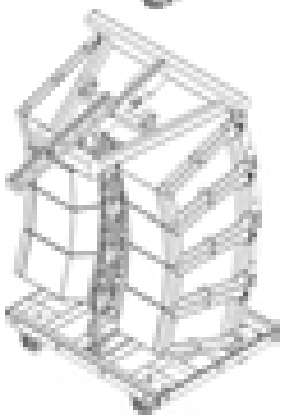


EXT-HALO-B positioned for uptilt



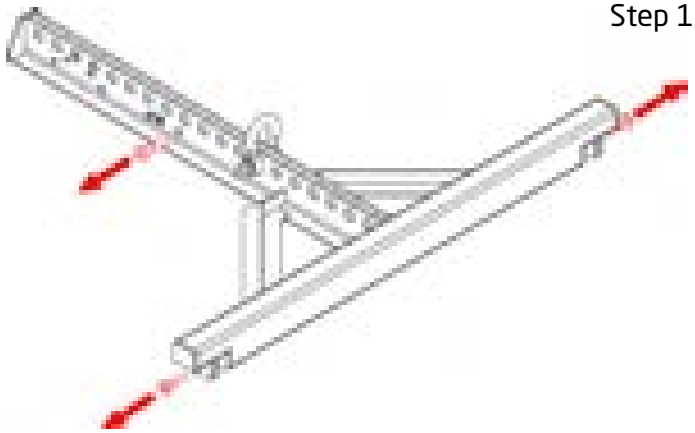


EXT-HALO-B positioned for downtilt



Use EASE Focus 3 to determine the appropriate pickup hole to attach the shackle to to obtain the desired grid angle.

6.2.5 – Flying using SM-HALO-B



Step 1.

Remove the two front enclosure link pins, and the splay link attachment pin in the spine.

Step 2.

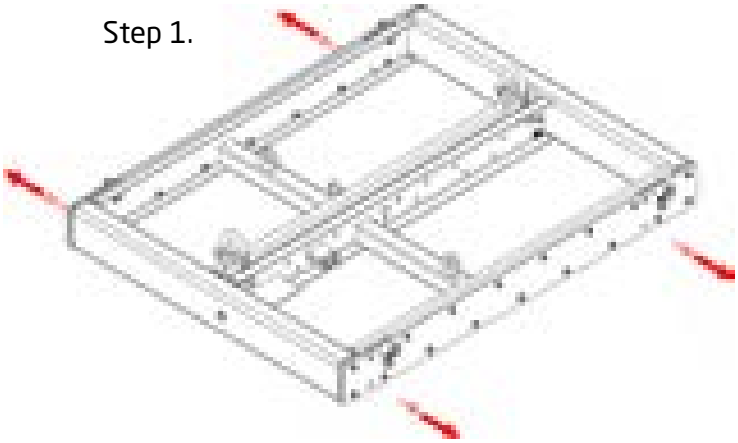
Follow the same procedure as outlined within section 6.2.2 to attach to HALO-B enclosures.

IMPORTANT NOTE:

SM-HALO-B ACCESSORIES CAN BE USED TO SUPPORT A MAXIMUM OF FOUR HALO-B ENCLOSURES

6.3 – Flying HALO-B with ST-215 subwoofers

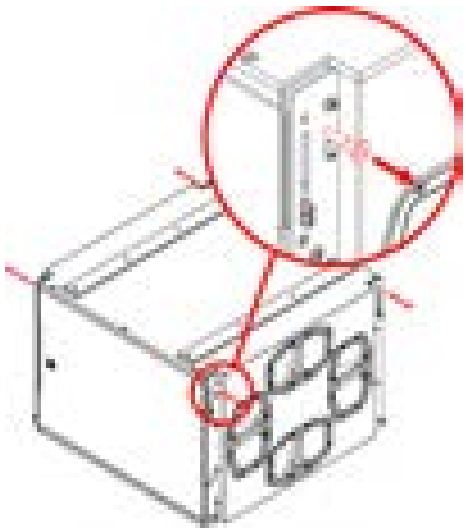
Step 1.



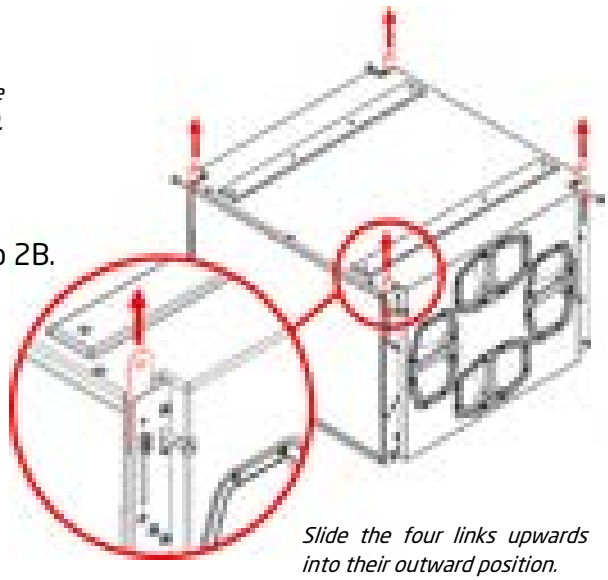
Prepare the FG-HALO-B by positioning the pickup links in their appropriate positions according to your EASE Focus 3 simulation, and removing the Front Link Attachment pins and the Subwoofer Link Attachment pins.

Step 2A.

Prepare the first ST-215 subwoofer. Leave the subwoofer the correct way up (floor runners upwards). Remove the link pins on all four corners.

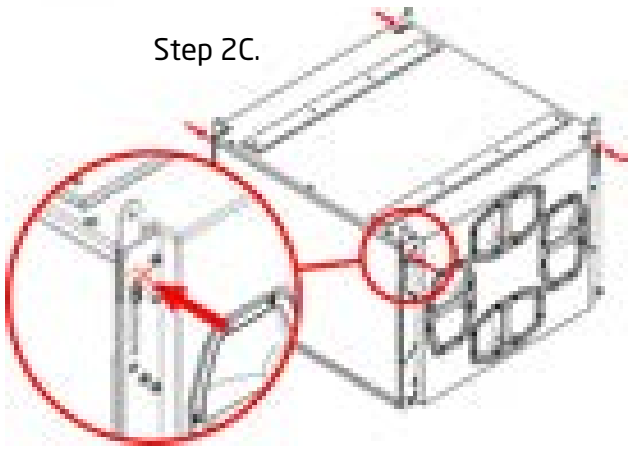


Step 2B.



Slide the four links upwards into their outward position.

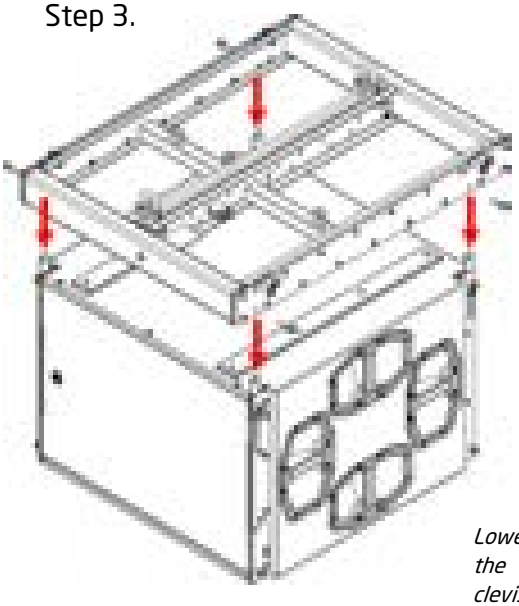
Step 2C.



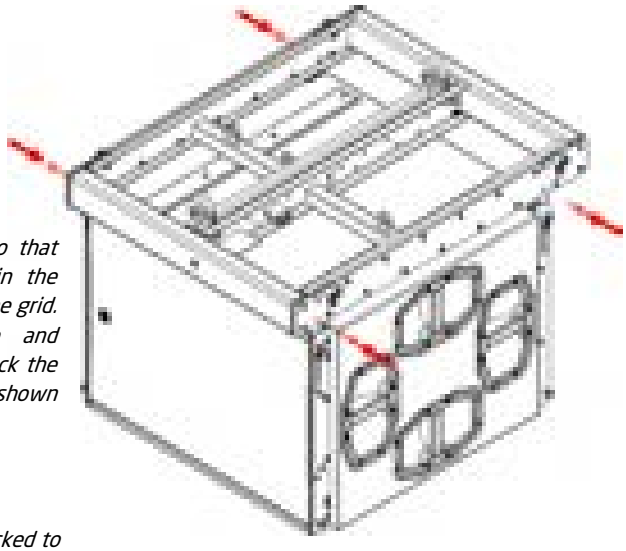
Replace the four link pins in their corresponding pin holes, locking the four links extended.

Your ST-215 is now ready to be flown.

Step 3.

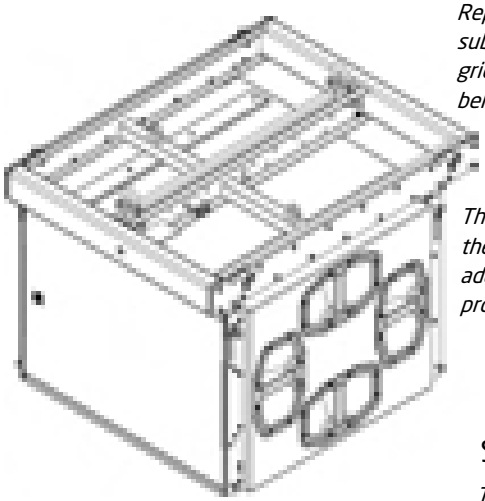


Position the FG-HALO-B above the extended links, ready to lower and engage.

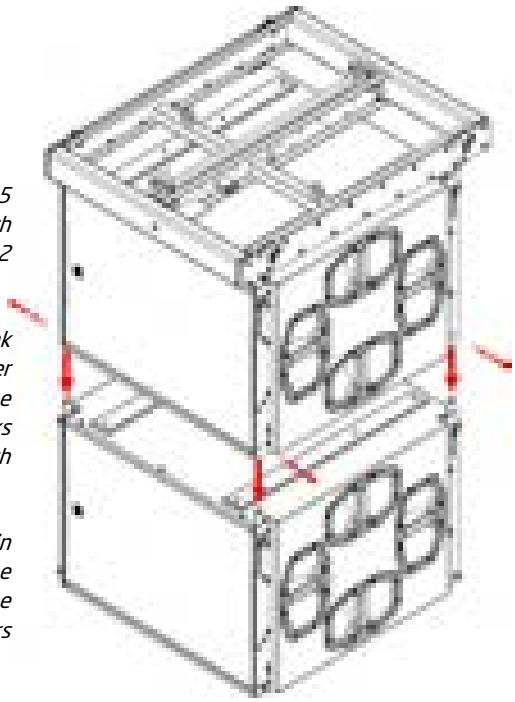


Step 4.

Lower the FG-HALO-B so that the four links engage in the clevis in each corner of the grid. Replace the enclosure and subwoofer link pins to lock the grid to the subwoofer as shown below.



The FG-HALO-B is low locked to the subwoofer. If you are not adding any further subwoofers, proceed to step 6 overleaf.

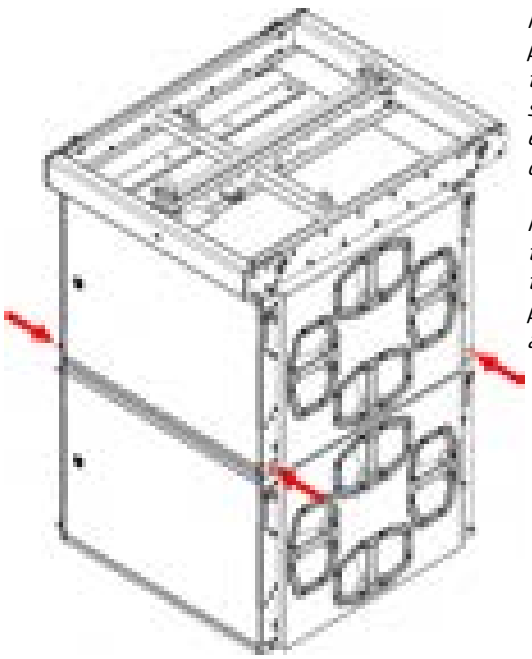


Step 5.

To add additional ST-215 subwoofers, prepare them with their links extended as in step 2 above.

Remove the lower enclosure link pins on the first ST-215 and lower the first subwoofer on top of the second, ensuring that the links engage in the clevises in each corner of the subwoofer.

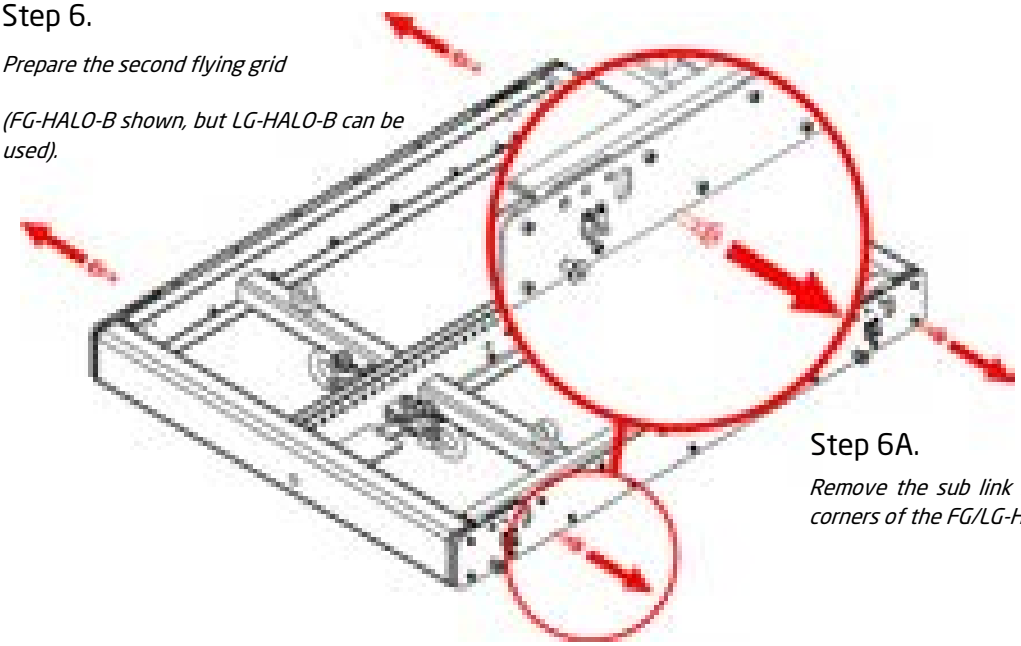
Replace the enclosure link pins in the first subwoofer, locking the two together. Repeat the procedure to add more subwoofers as necessary.



Step 6.

Prepare the second flying grid

(FG-HALO-B shown, but LG-HALO-B can be used).

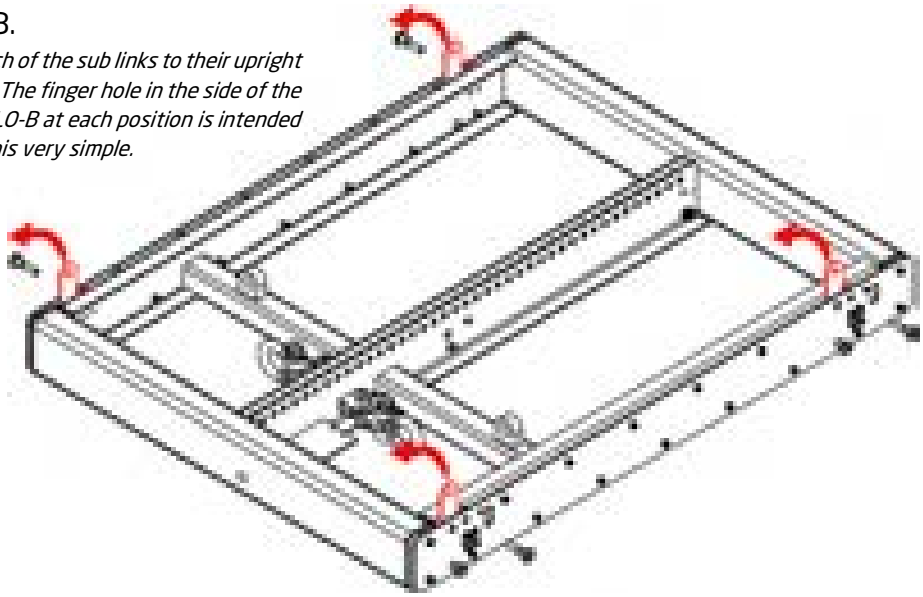


Step 6A.

Remove the sub link lock pins in all four corners of the FG/LG-HALO-B.

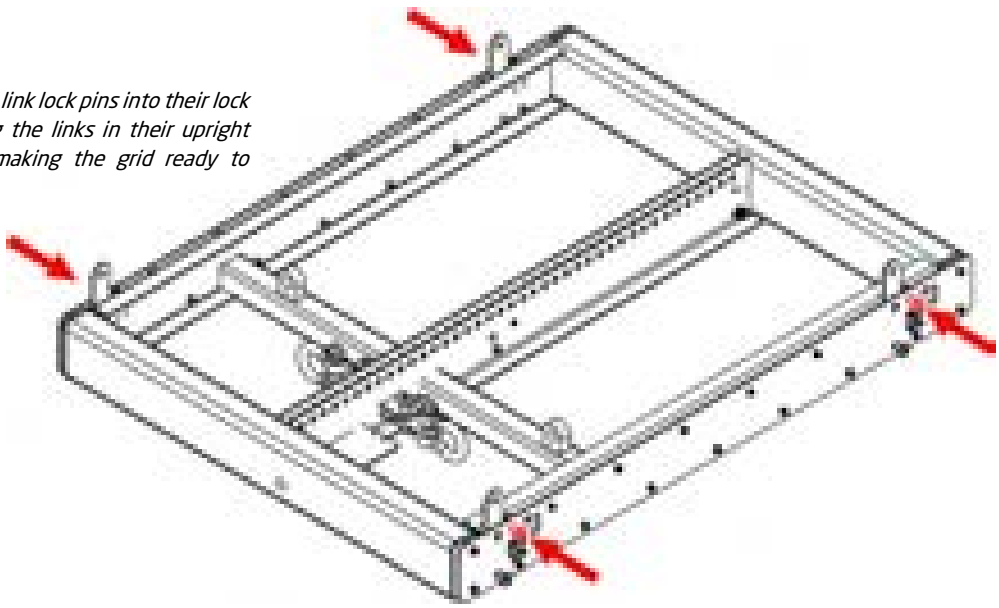
Step 6B.

Rotate each of the sub links to their upright positions. The finger hole in the side of the FG/LG-HALO-B at each position is intended to make this very simple.

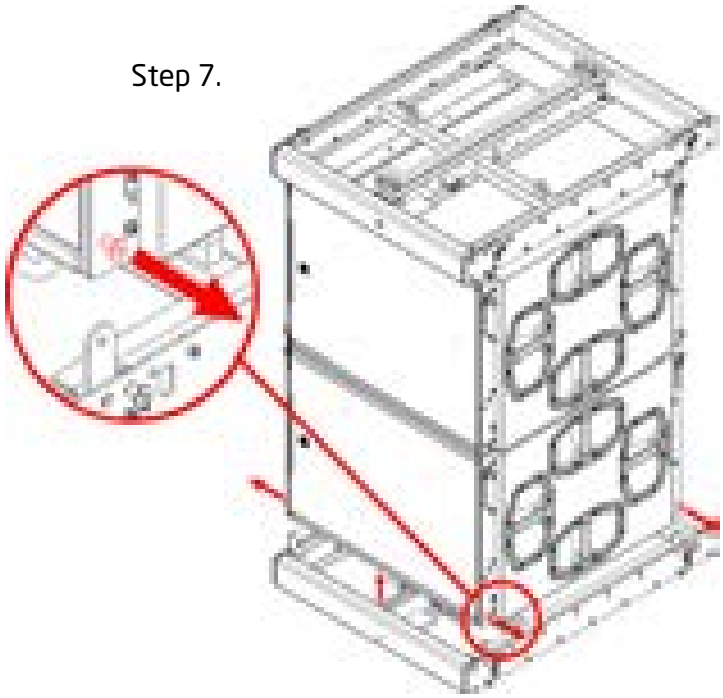


Step 6C.

Replace the sub link lock pins into their lock positions, fixing the links in their upright positions and making the grid ready to attach.

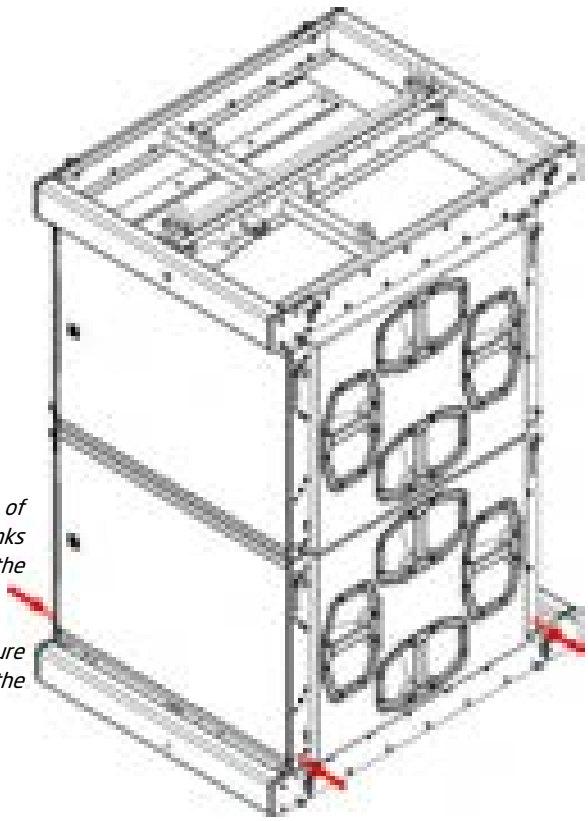


Step 7.



Position the second flying grid underneath the flown subwoofer column.

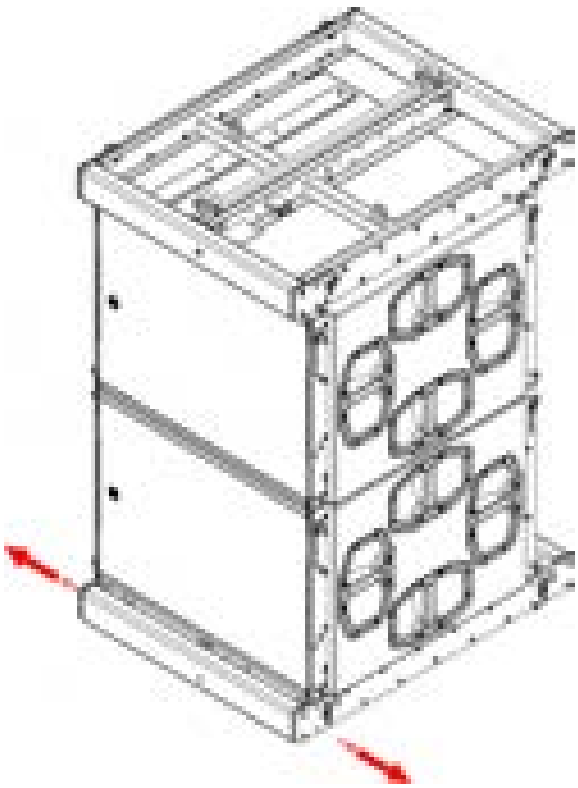
Remove the lower enclosure link pins on all four corners of the bottom subwoofer.



Step 8.

Lift the second flying grid up to the bottom of the ST-215, ensuring that the four sub links engage into the clevises in the bottom of the subwoofer.

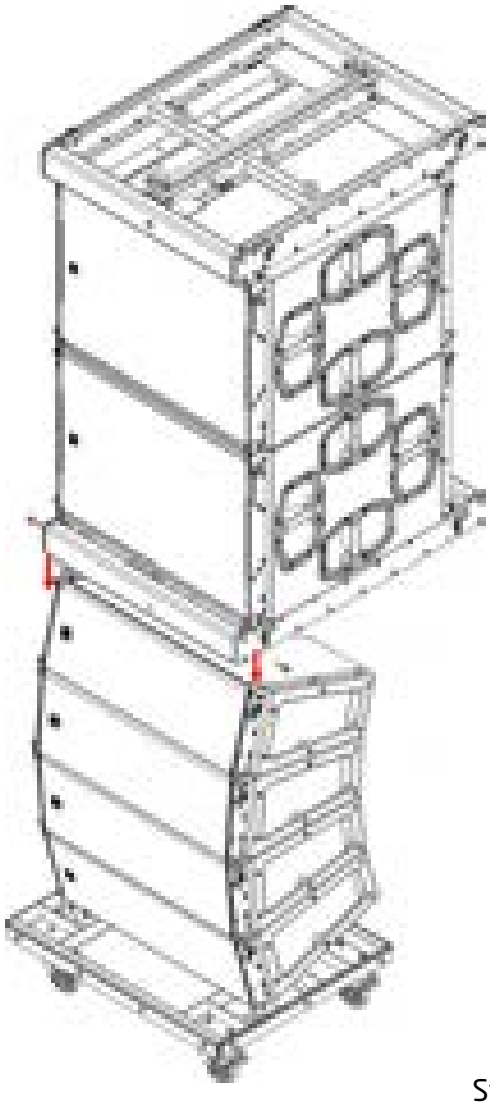
Replace the four enclosure link pins to secure the FG/LG-HALO-B to the bottom of the subwoofer column.



Step 9.

Remove the front enclosure link pins, ready to attach the HALO-B enclosures.

Also, remove the splay link attachment pin in the FG/LG-HALO-B spine.



Step 10.

Prepare your first cart of HALO-B enclosures as detailed in section 6.2.2.

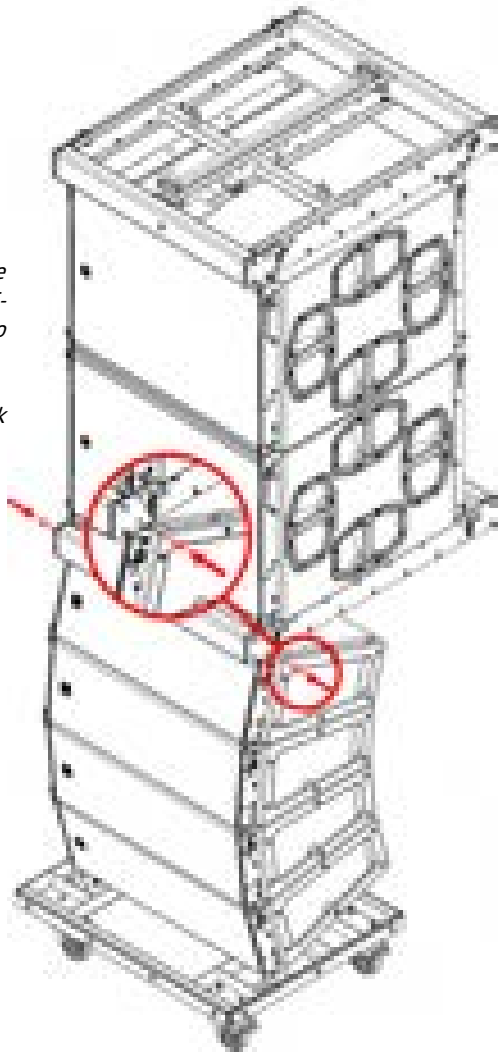
Position this cart of HALO-B underneath your flown ST-215 column.

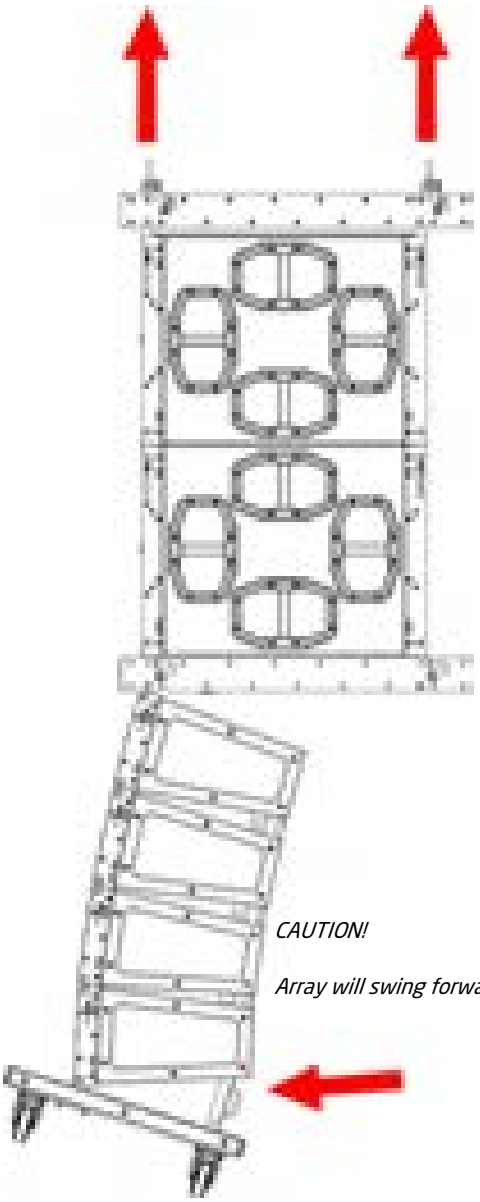
Lower the subwoofer column toward the HALO-B enclosures.

Step 10.

Ensuring the HALO-B front links engage in the front point clevis on the FG or LG-HALO-B grid, secure the HALO-B cart to the grid by replacing the pins.

Do not attempt to connect the splay link of the HALO-B enclosures yet.





Step 11.

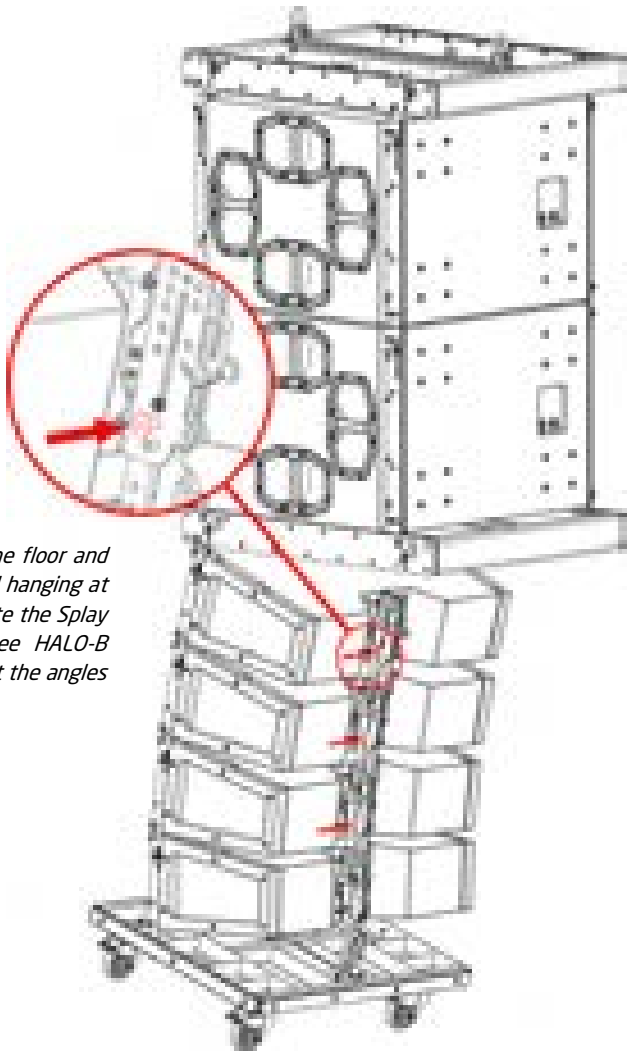
Lift the array until the WC-HALO-B is clear of the floor.

As the HALO-B enclosures leave the floor, the angles at the rear will open to the settings you have determined.

Take care as the HALO-B elements will tend to swing forward as they leave the ground.

CAUTION!

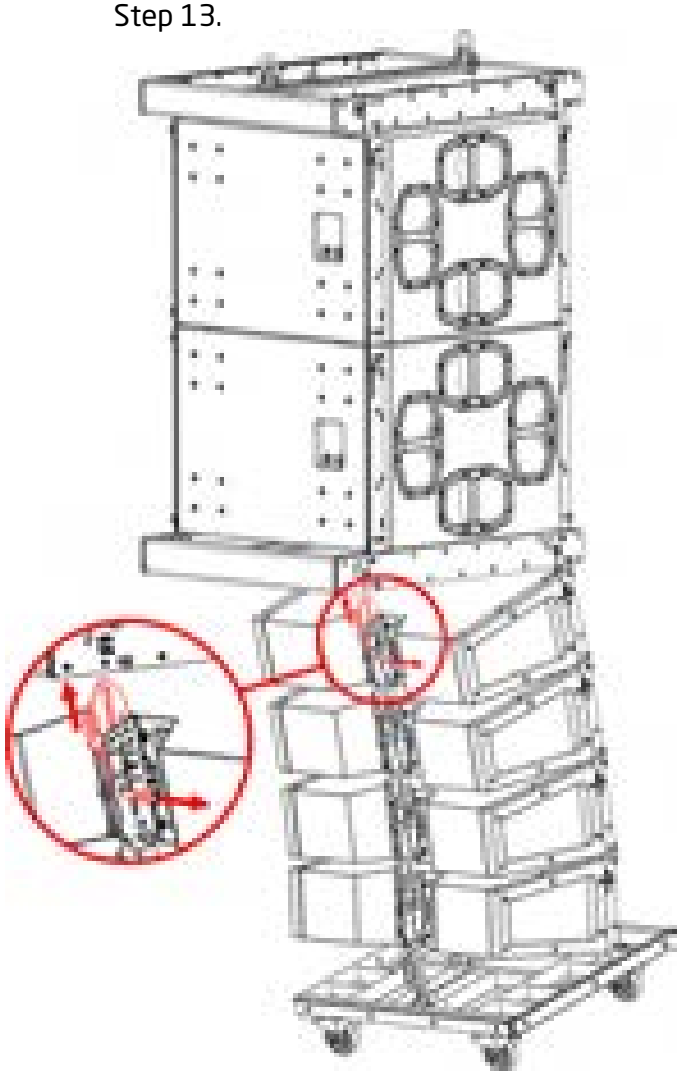
Array will swing forward.



Step 12.

Once the array is clear of the floor and the HALO-B elements are all hanging at their desired angles, reinstate the Splay Lock pins on the top three HALO-B enclosures - this will prevent the angles closing.

Step 13.

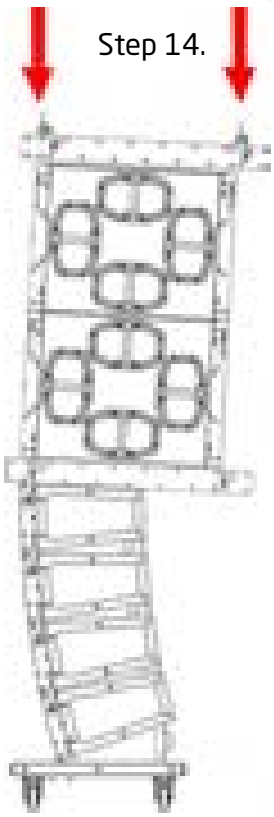


Keeping the array hanging, remove the Angle Set pin from its stow location on the first HALO-B element.

Extend the Splay Link to the desired angle - paying attention to the legend on the FG-HALO-B spine with regards indicated angle compared to actual angle.

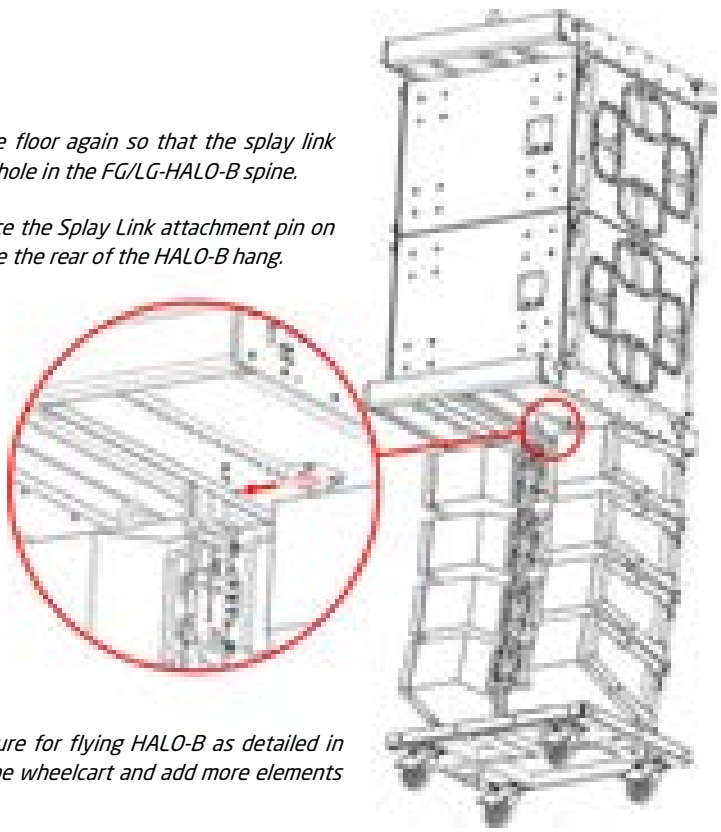
Reinstate the Angle Set pin at the desired location to set the angle.

Step 14.



Land the array back on the floor again so that the splay link moves toward the location hole in the FG/LG-HALO-B spine.

Once it is in position, replace the Splay Link attachment pin on the FG/LG-HALO-B to secure the rear of the HALO-B hang.



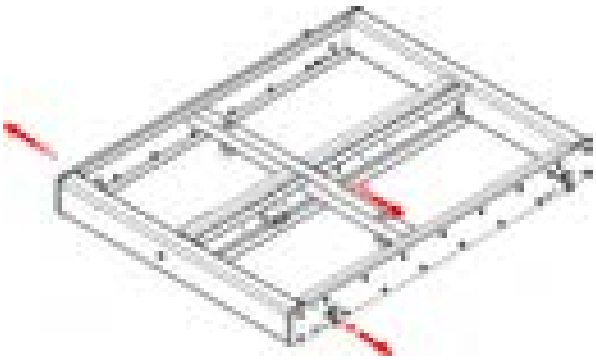
Continue with the procedure for flying HALO-B as detailed in section 6.2.2 to remove the wheelcart and add more elements as required.

emacoustics

6.4 – Ground Stacking HALO-B

6.4.1 – Ground Stacking with FG-HALO-B (or LG-HALO-B)

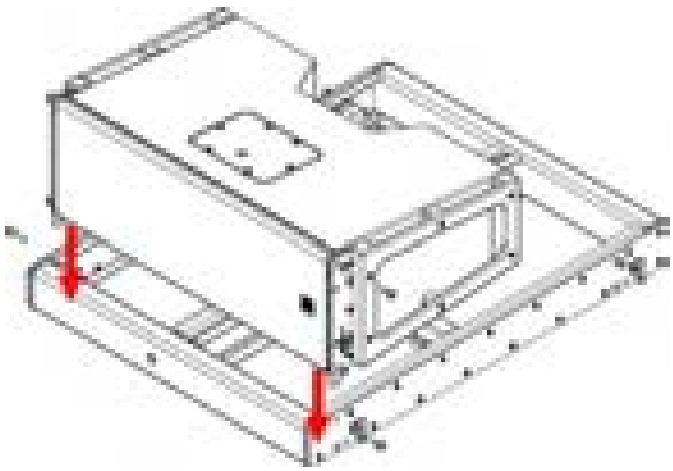
The procedure below details ground stacking with the FG-HALO-B grid, however the procedure is the same when using the LG-HALO-B grid.



Step 1.

Prepare the FG-HALO-B by inverting it and removing the Front Link Attachment pins and the Splay Link Attachment pin.

Ensure that the FG-HALO-B is on a flat surface and is stable before proceeding any further.

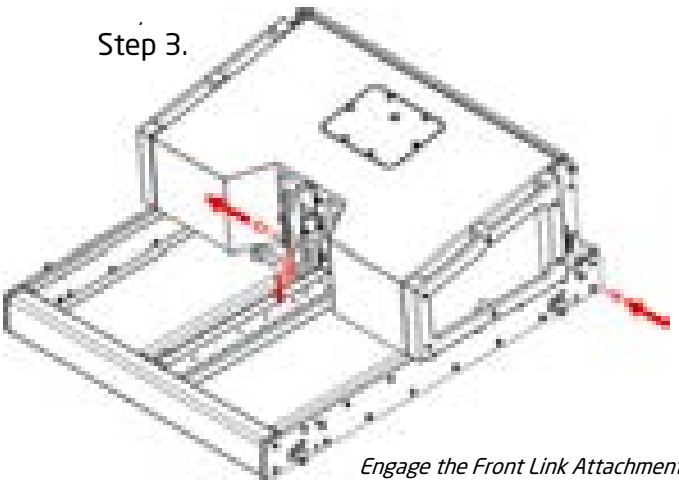


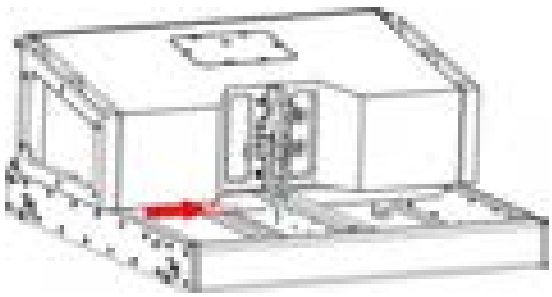
Step 2.

Prepare the first HALO-B enclosure by extending the front rigging links as described in 6.1.1 above.

Invert the HALO-B and lower it into position so that the front links engage in their receptacles on the FG-HALO-B.

Step 3.

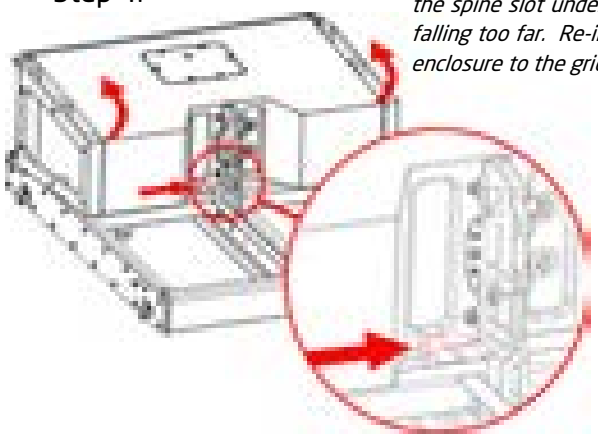




Engage the Front Link Attachment pins to secure the HALO-B to the FG-HALO-B and then lower the rear of the enclosure to rest on the FG-HALO-B spine.

Step 4.

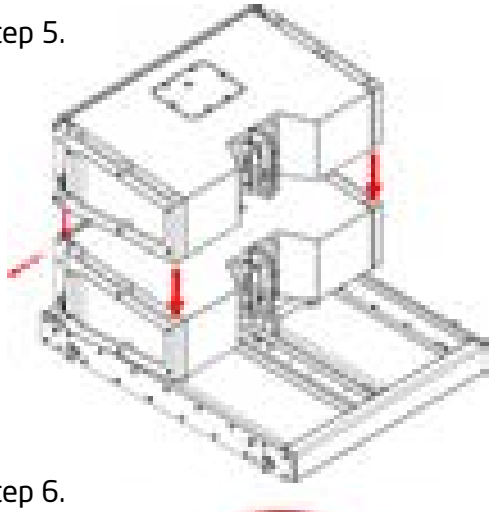
Remove the Angle Set pin from the rear of the HALO-B, which will allow the splay link to drop down into the spine slot under gravity. There is a metal stop welded to the spine which prevents the link from falling too far. Re-insert the Splay Link Attachment pin into the spine of the FG-HALO-A to secure the enclosure to the grid.



Lift the rear of the HALO-B enclosure to allow the splay link to move within the splay rigging assembly. Select the appropriate angle as determined by your EASE Focus simulation, and insert the Angle Set pin into the appropriate hole.

Pay close attention to the label on the FG-HALO-B which illustrates the difference between indicated angle and achieved angle on the FG-HALO-B.

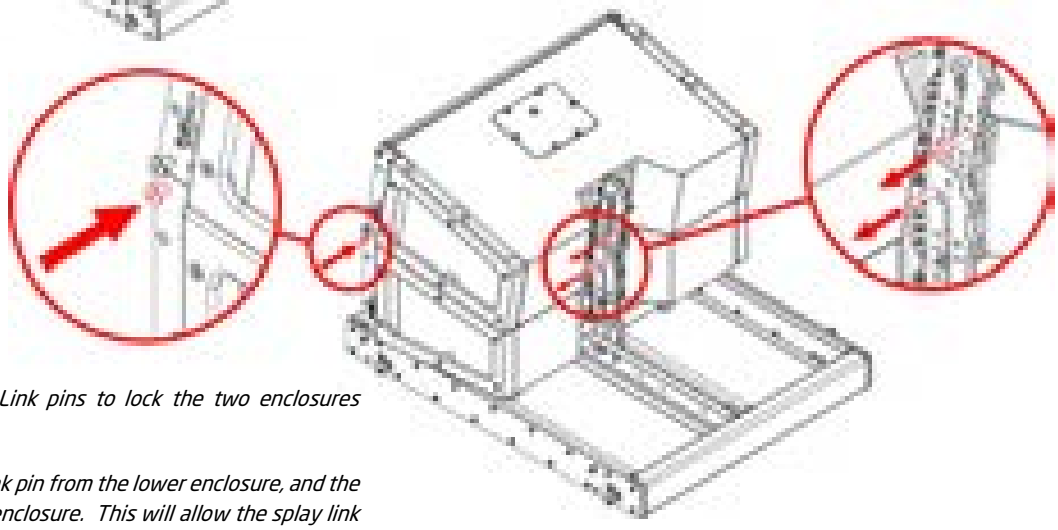
Step 5.



Remove the Front Enclosure Link pins from the attached HALO-B enclosure.

Prepare a second HALO-B enclosure as described in 6.1.1 above. Invert the enclosure and lower it into place on the first.

Step 6.

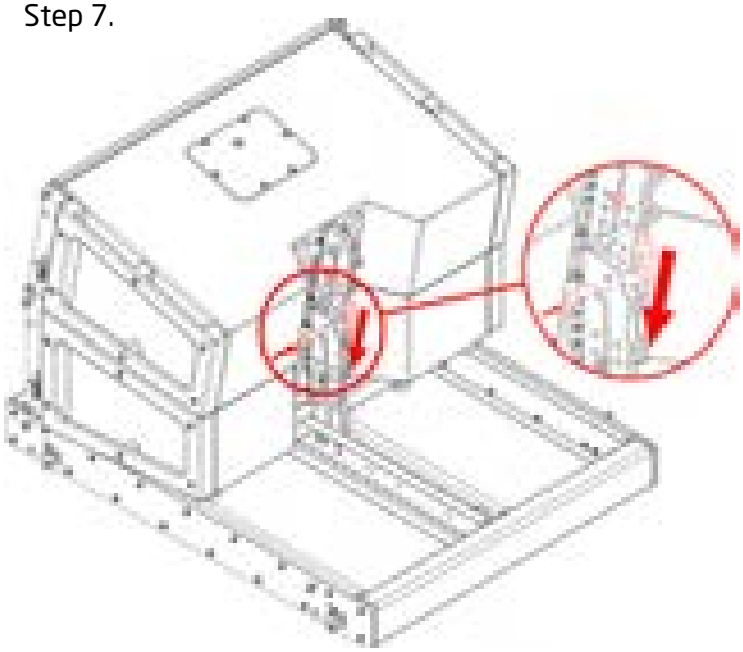


Replace the Front Enclosure Link pins to lock the two enclosures together.

Remove the Rear Enclosure Link pin from the lower enclosure, and the Angle Set pin from the upper enclosure. This will allow the splay link to drop under gravity into the enclosure link receptacle on the lower enclosure.

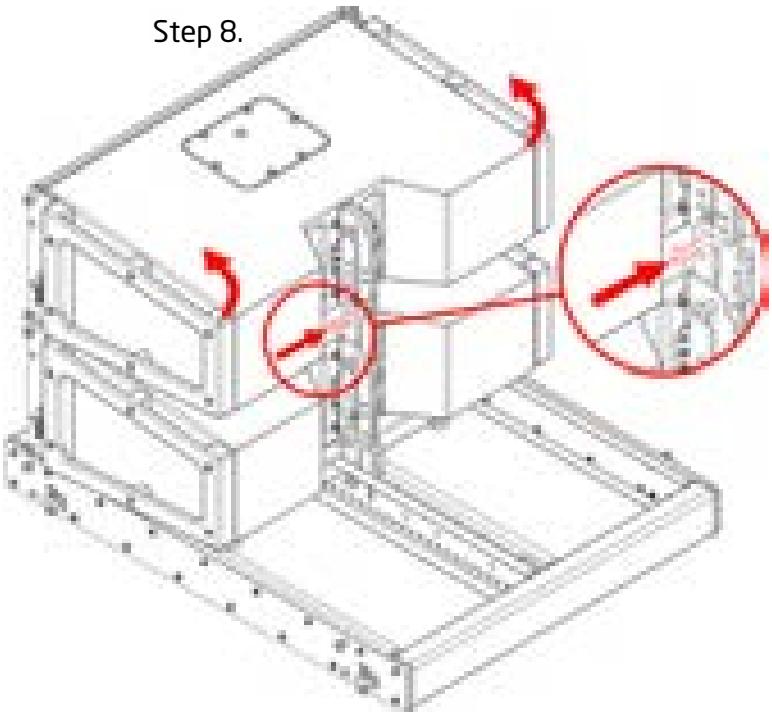
It will rest on the splay lock pin of the lower enclosure, preventing it from falling too far.

Step 7.



Insert the Rear Enclosure Link pin which will join the two enclosures together.

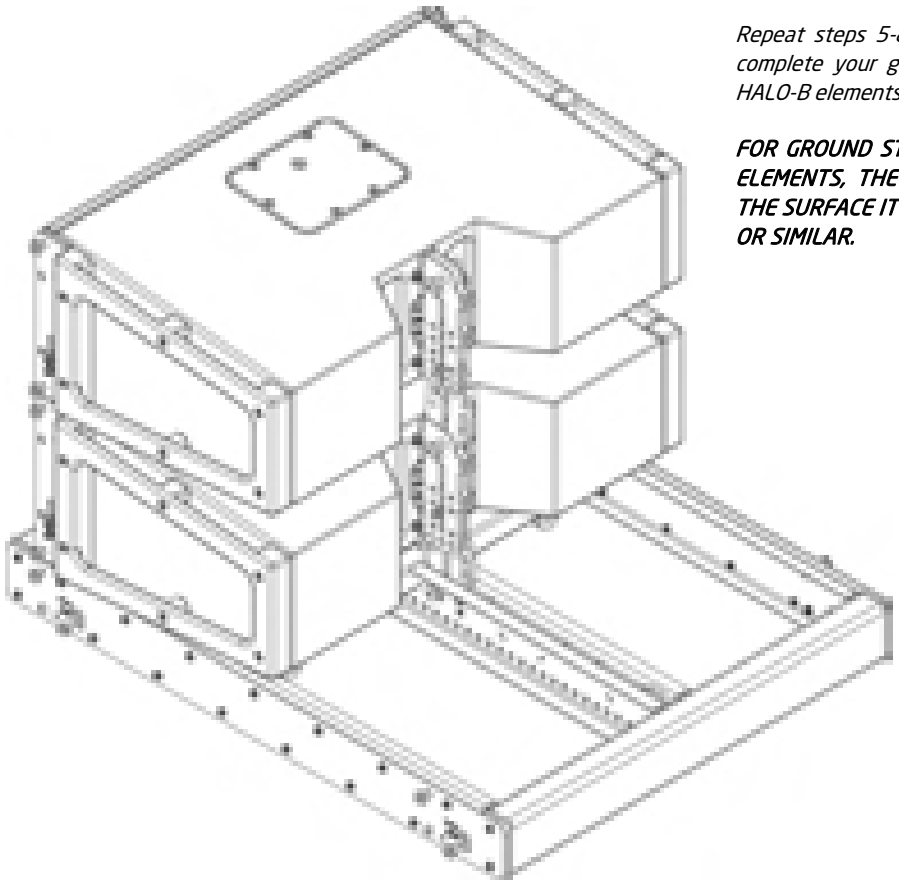
Step 8.



Lift the rear of the upper enclosure, allowing the splay link to move within the splay rigging assembly.

Select the desired angle from your EASE Focus simulation and insert the Angle Set pin into the corresponding location hole.

Step 9.



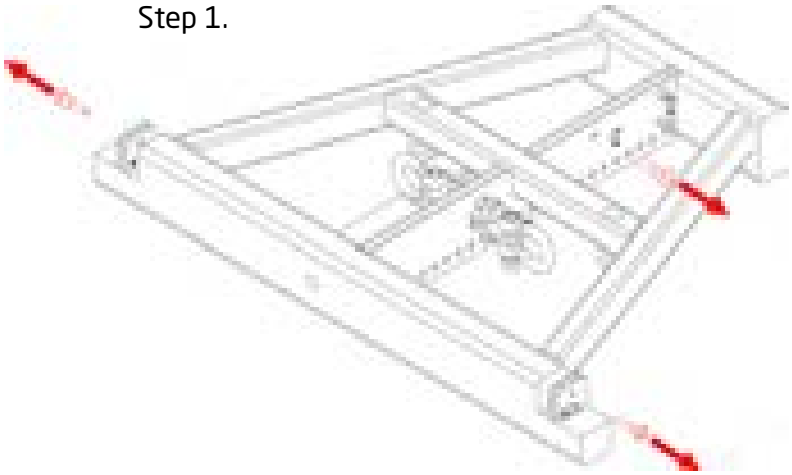
Repeat steps 5-8 with further HALO-B enclosures to complete your ground stack, up to a maximum of 8 HALO-B elements.

FOR GROUND STACKS GREATER THAN TWO HALO-B ELEMENTS, THE FG-HALO-B MUST BE SECURED TO THE SURFACE IT IS RESTING ON BY RATCHET STRAPS OR SIMILAR.

6.4.2 - Ground Stacking with CG-HALO-B

The procedure is identical to that of using the FG-HALO-B described in 6.4.1 above.

Step 1.

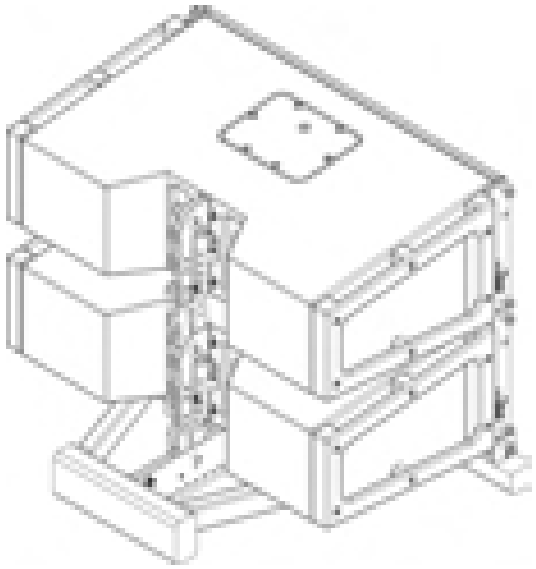


Prepare the CG-HALO-B by inverting it and removing the Front Link Attachment pins and the Splay Link Attachment pin.

Ensure that the CG-HALO-B is on a flat surface and is stable before proceeding any further.

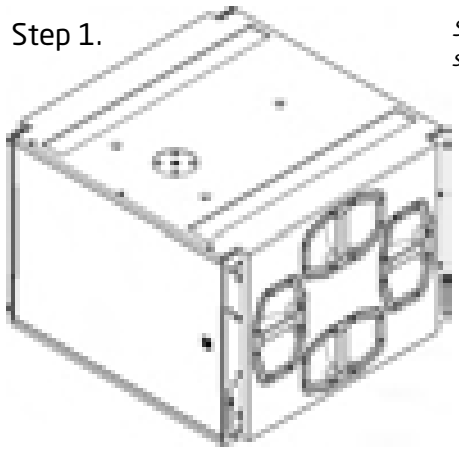
Repeat the steps in 6.4.1 above to build the ground stack, up to a maximum of 6 HALO-B elements.

FOR GROUND STACKS GREATER THAN TWO HALO-B ELEMENTS, THE CG-HALO-B MUST BE SECURED TO THE SURFACE IT IS RESTING ON BY RATCHET STRAPS OR SIMILAR.



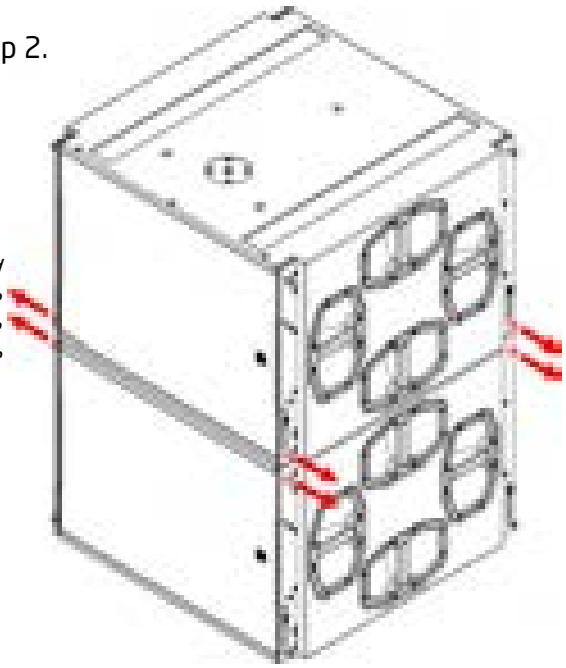
6.4.3 - Ground Stacking with ST-215 & FG-HALO-B (or LG-HALO-B)

Step 1.

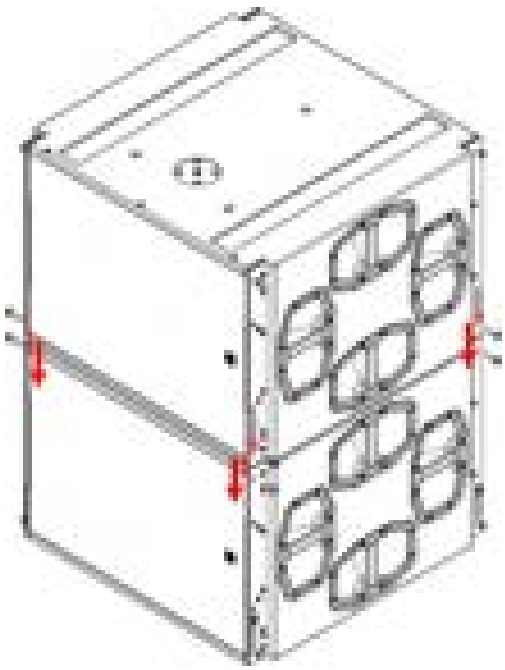


ST-215 subwoofers should be inverted for ground stacking - so that the subwoofer sits on its runners, and the polemount is visible.

Step 2.

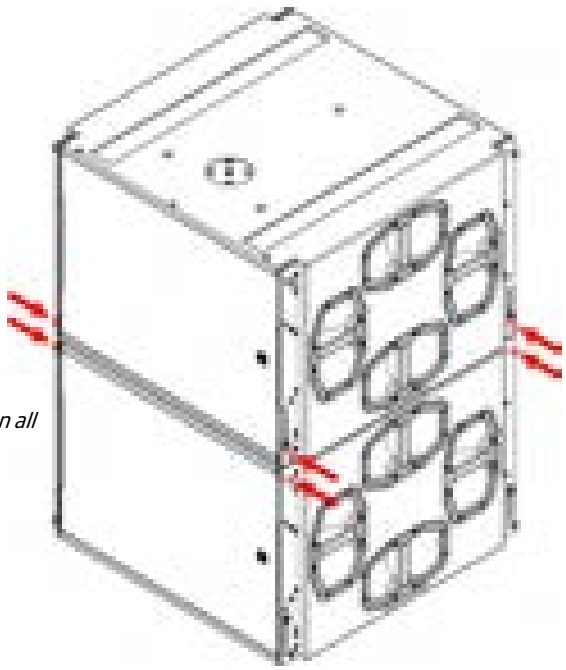


If ground stacking more than one ST-215, invert the second subwoofer and sit it on top of the first, so its runners sit into the recesses on the first subwoofer cabinet. Then, remove both the Enclosure Link and Link Lock pins on all four rigging hardware assemblies.



Step 3.

When both pins are removed, the four Enclosure Links will drop down under gravity into the clevises on the subwoofer below.

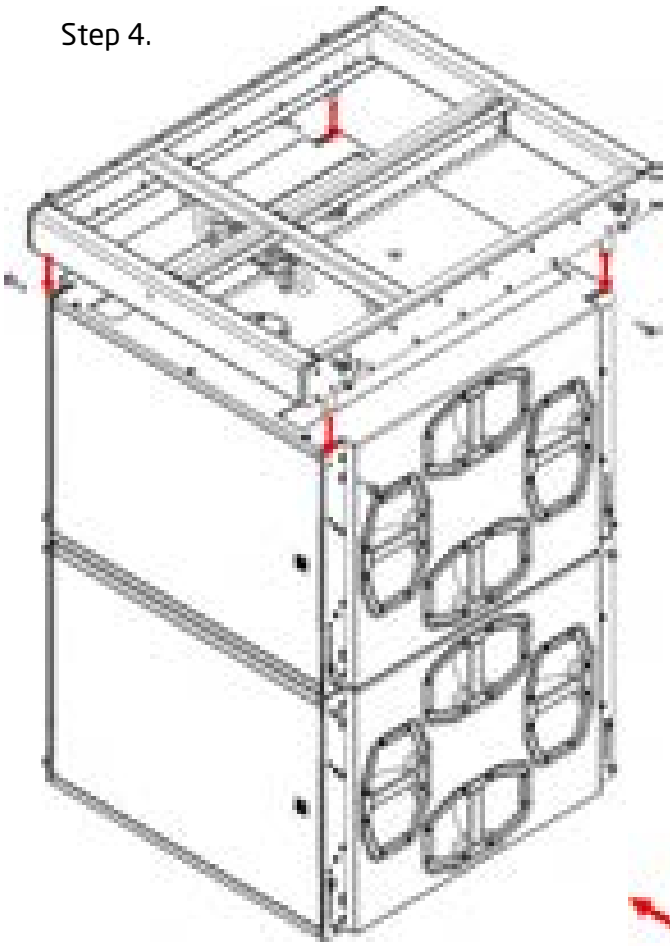


Step 4.

Reinstate both the Enclosure Link and Link Lock pins on all four corners to lock the subwoofers together.

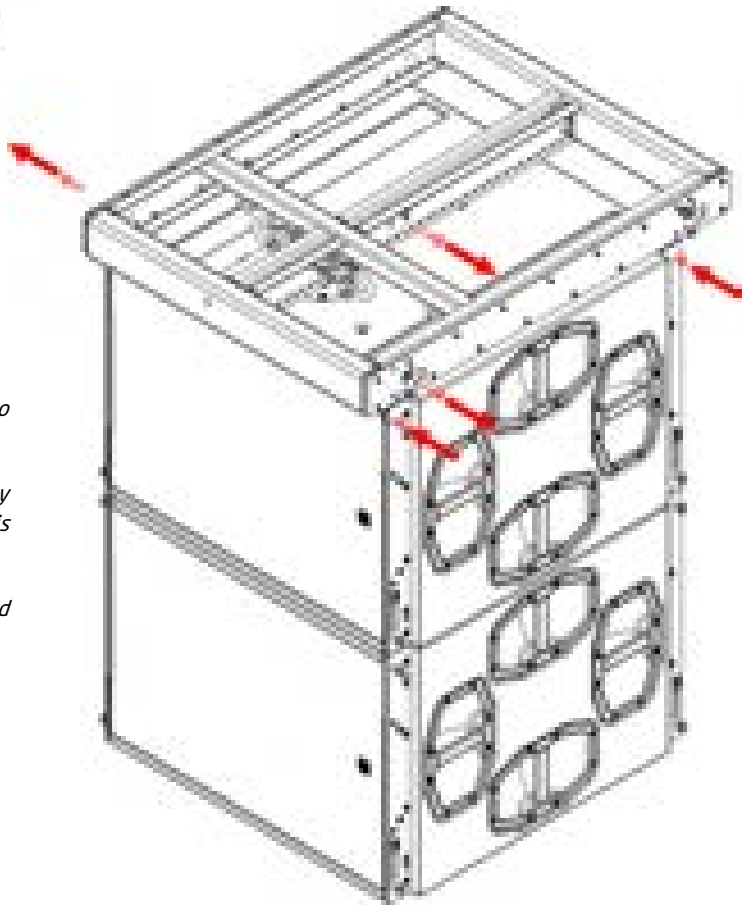
Repeat this process if adding more subwoofers.

Step 4.



Prepare an FG-HALO-B or LG-HALO-B as described in Section 6.3 step 6 above, rotating the sub links into their use positions and then inverting the FG/LG-HALO-B.

Lower the FG/LG-HALO-B into position so that each of the sub links engage in the clevis in each corner of the ST-215.



Step 5.

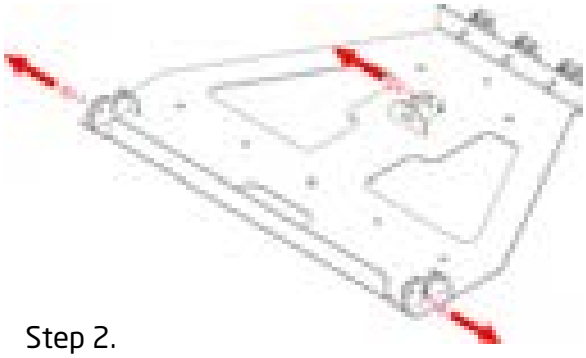
Replace the Enclosure Link pins on all four corners to lock the FG/LG-HALO-B to the ST-215.

Remove the front Enclosure Link pins, and the Splay Link pin on the spine, from the FG/LG-HALO-B so it is ready to receive HALO-B enclosures.

HALO-B enclosures can now be added to the ground stack as described in Section 6.4.1 above.

6.4.4 – Ground Stacking with GS-HALO-B

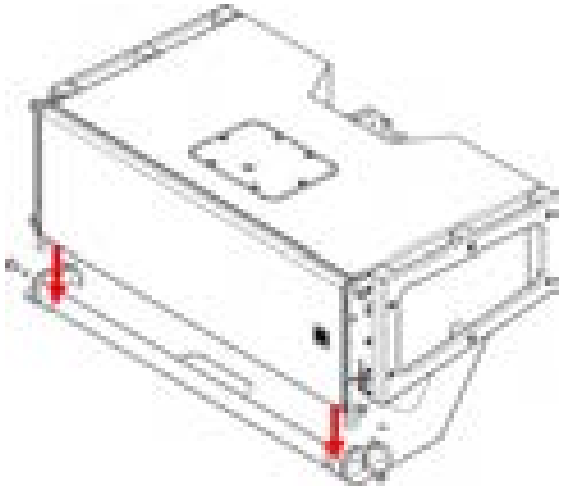
Step 1.

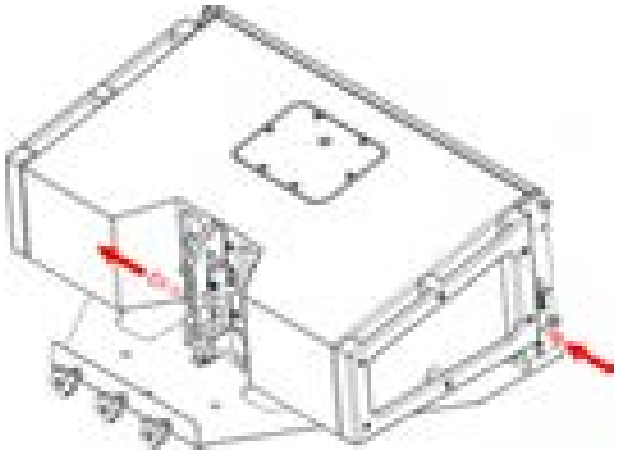


Prepare the GS-HALO-B by ensuring it is on a flat, stable surface. Remove the front Enclosure Link pins and the central Splay Link pin.

Step 2.

Prepare the first HALO-B enclosure by extending the front rigging links and inverting the enclosure. Line up the enclosure so that the front links are ready to engage in the clevis on each side.





Step 3.

Reinstate the front Enclosure Link pins on the GS-HALO-B to lock the first enclosure to the plate.

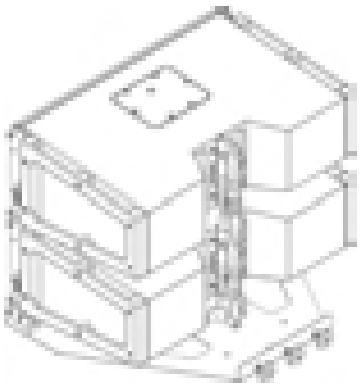
Remove the Angle Set pin from the rear rigging assembly – the Splay Link will drop down under gravity. Ensure it engages in the central clevis, where there is a stop to prevent it travelling too far.

Reinstate the Splay Link pin on the GS-HALO-B to secure the Splay Link to the plate, and as with other ground stack systems then lift the rear of the HALO-B to arrive at the correct angle, and then reinstate the Angle Set pin to lock the angle in place.

Step 4.

Repeat steps 2 & 3 above to build the ground stack, up to a maximum of 6 HALO-B elements.

FOR GROUND STACKS GREATER THAN TWO HALO-B ELEMENTS, THE GS-HALO-B MUST BE SECURED TO THE SURFACE IT IS RESTING ON BY BOLTS, RATCHET STRAPS OR SIMILAR.

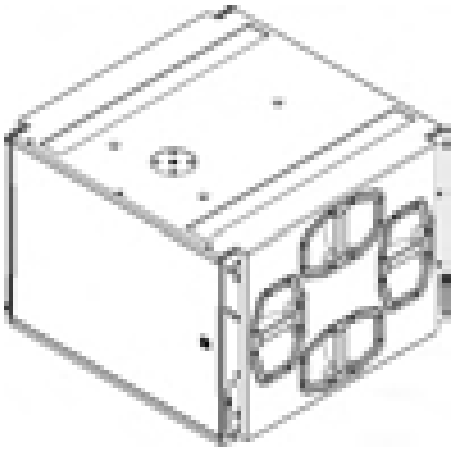


6.4.5 – Using GS-HALO-B as an installation bracket

GS-HALO-B can be used to fly up to pairs of HALO-B enclosures in an installation environment. Additional mounting holes in the GS-HALO-B plate are provided for this purpose.

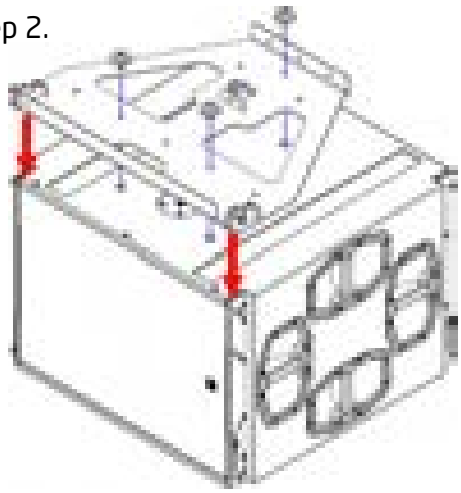
6.4.6 - Ground Stacking with ST-215 & GS-HALO-B

Step 1.



Prepare the ST-215 subwoofer by inverting so it sits on its floor runners. If more than one subwoofer is being used, lock them together using the flying system as described in Section 6.4.3 above.

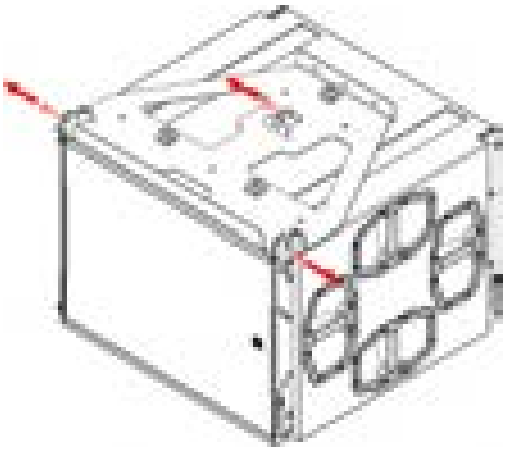
Step 2.



Position the GS-HALO-B on top of the ST-215, so that the three M8 clearance mounting holes line up with the M8 threaded fittings in the top of the ST-215.

Remove the M8 lobe knobs from the storage bosses on the GS-HALO-B, and use them to secure the GS-HALO-B tightly to the top of the ST-215.

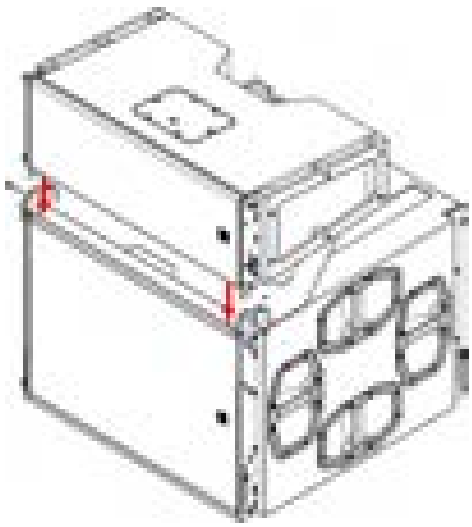
Step 3.



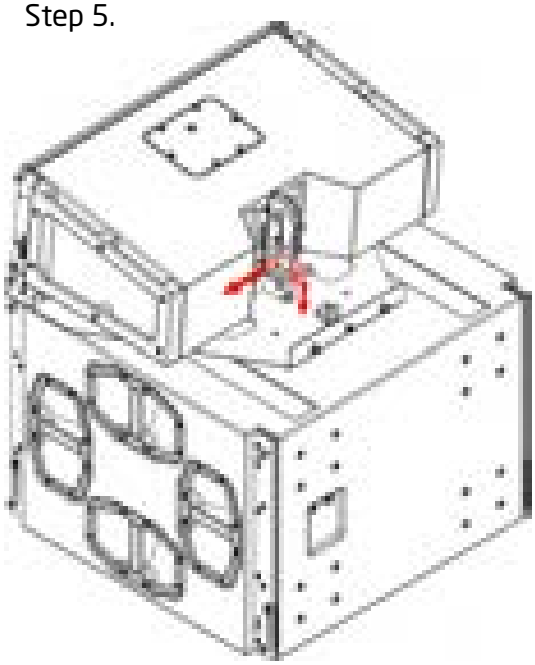
Remove the front Enclosure Link pins, and the central rear Splay Link pin.

Step 4.

Prepare the first HALO-B enclosure as described in the previous sections - extend the front rigging links, invert the enclosure and position so that the front rigging links engage into the clevises on either side of the GS-HALO-B.



Step 5.

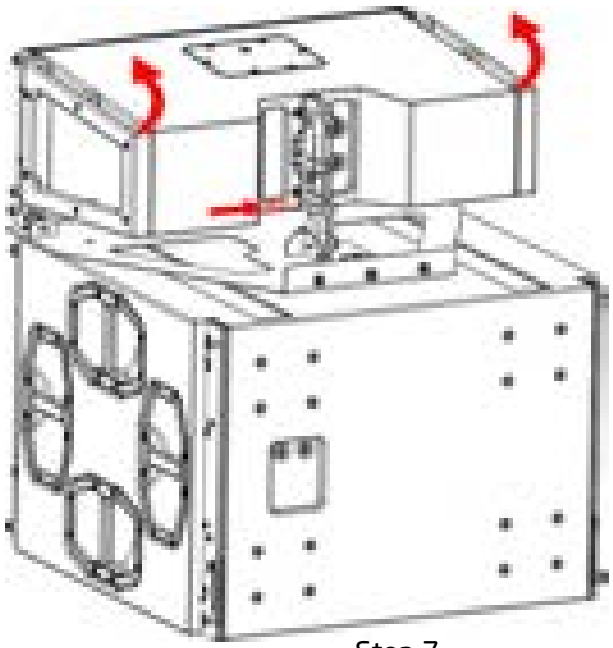


Remove the Angle Set pin from the rear rigging assembly - the Splay Link will drop down under gravity. Ensure it engages in the central clevis, where there is a stop to prevent it travelling too far.

Reinstate the Splay Link pin on the GS-HALO-B to secure the Splay Link to the plate.

Step 6.

Lift the rear of the HALO-B to arrive at the correct angle according to your EASE Focus 3 simulation, and then reinstate the Angle Set pin to lock the angle in place.



Step 7.

Repeat steps 4-6 above to build the ground stack, up to a maximum of 6 HALO-B elements on two subwoofers, or four elements on three subwoofers.

FOR ANY GROUND STACK SYSTEM, ENSURE THE STACK IS ON LEVEL, STABLE GROUND AND CANNOT TOPPLE OVER. IF IN DOUBT, SECURE THE STACK USING RATCHET STRAPS OR SIMILAR TO ENSURE THERE IS NO RISK TO ANY PERSON NEAR THE ARRAY.

6.5 Using the CHAIN-HALO-B lifting chain

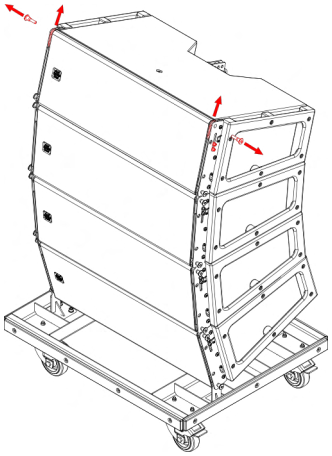
Self-climbing motors have chain bags, which hang below the motor and can foul the correct position of the HALO-B flying grid. The CHAIN-HALO-B is a 1m effective length lifting chain with a SWL of 760kg which is intended to sit between the motor hook and the FG- or CG-HALO-B pickup link. The CHAIN-HALO-B has a chain hook included so that the chain length can be adjusted as necessary.

Using the CHAIN-HALO-B allows you to create sufficient space below the motor for the chain bag to sit safely.

6.6 - Using HALO-B as a downfill for HALO-A systems

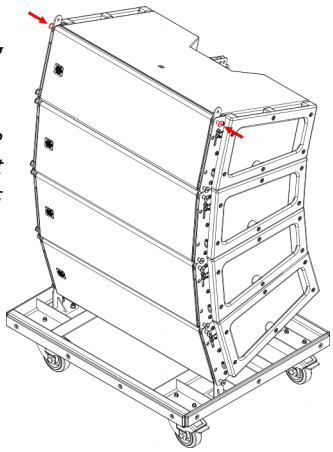
Step 1. *Assemble your HALO-A array as detailed in the HALO-A user manual*

Step 2.

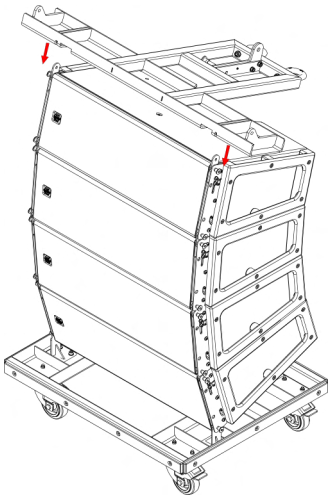


Prepare the first WC-HALO-B by extending the HALO-B front links.

Remove the Front Link Lock pins on the top HALO-B enclosure, extend the front links and replace the Front Link Lock pins to lock the links in place.



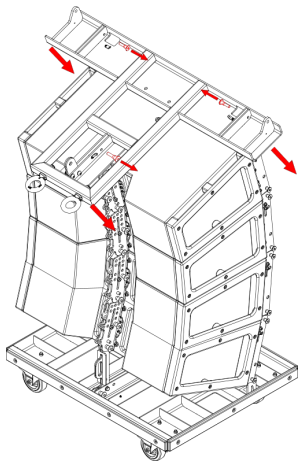
Step 3.



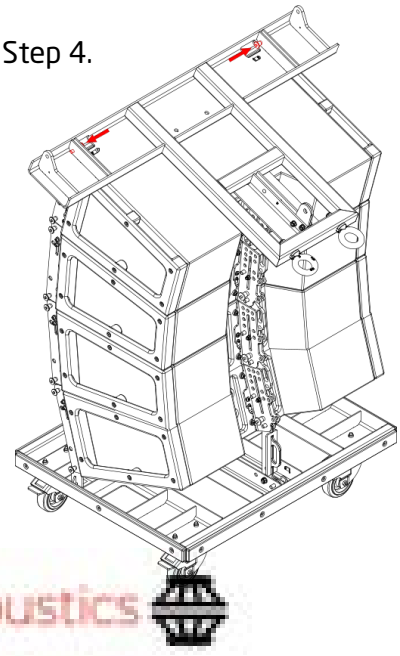
Position the PB-HALO-B above the WC-HALO-B.

Remove the HALO-B Front Link Attachment pins on both sides, and the HALO-B Rear Link Attachment pin from the PB-HALO-A spine.

Lower the PB-HALO-A on to the top HALO-B enclosure, ensuring that the HALO-B front enclosure links engage in the receptacle on the PB-HALO-B.

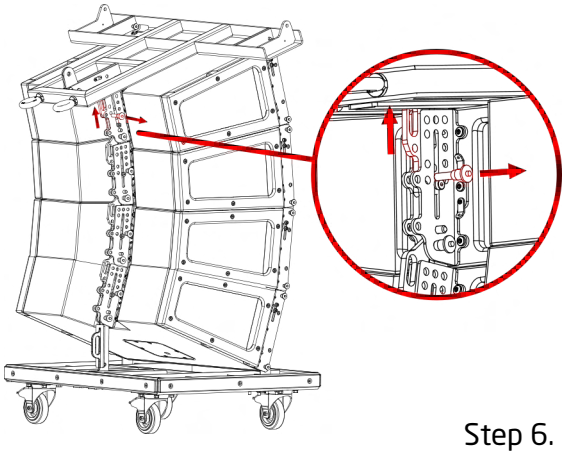


Step 4.



Insert the HALO-B Front Link Attachment pins back in place to secure the front of the PB-HALO-B to the top HALO-B enclosure.

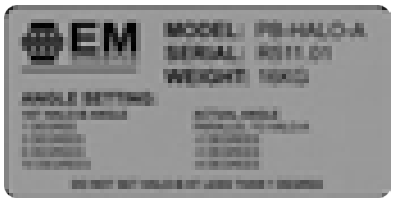
Step 5.



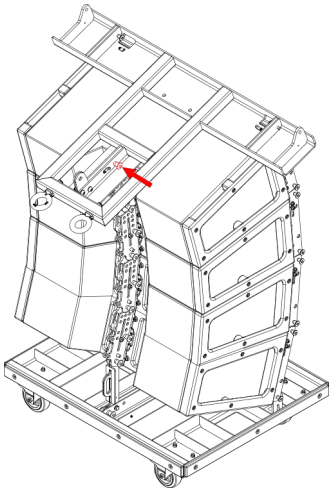
Remove the Angle Set pin from the first HALO-B enclosure, and slide the Splay Link upwards into the slot in the spine of the PB-HALO-A.

Slide the link upwards to select the angle required as per your EASE Focus simulation.

Note the label artwork on the PB-HALO-A which details the difference between indicated angle and actual angle on the HALO-B enclosure.

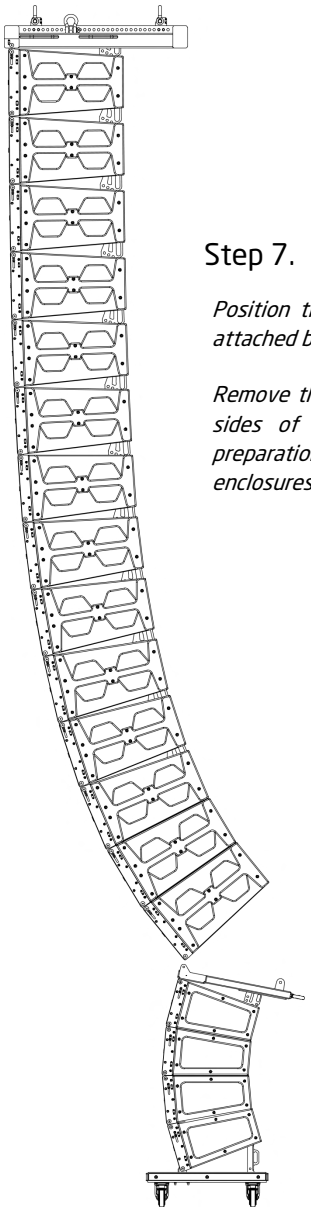


Step 6.



Lift the rear of the PB-HALO-A so that the Rear Link Attachment pin hole lines up with the slot in the splay link of the HALO-B enclosure. Insert the Rear Link Attachment pin in the PB-HALO-A to secure them.

TAKE NOTE: The splay link on a HALO-B is a slot, not a hole - and therefore the PB-HALO-A will drop down to rest on the HALO-B enclosure when released. Take care!

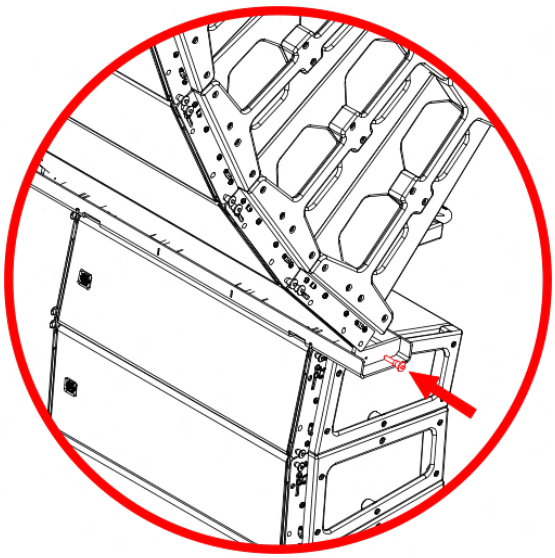


Step 7.

Position the WC-HALO-B with the PB-HALO-A attached below your flown HALO-A system.

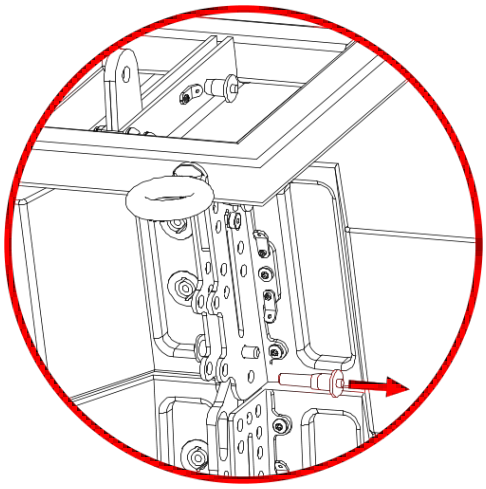
Remove the Front Enclosure Link pins on both sides of the bottom HALO-A enclosure in preparation for attaching the HALO-B enclosures.

Step 8.



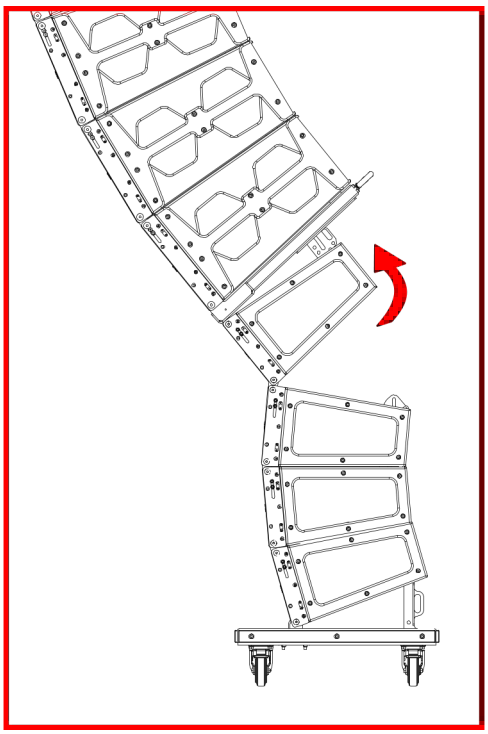
Line the HALO-A hang up with the PB-HALO-A front links.

Once completely lined up, replace the Front Enclosure Link pins to secure the front of the PB-HALO-A to the bottom HALO-A enclosure.



Step 9.

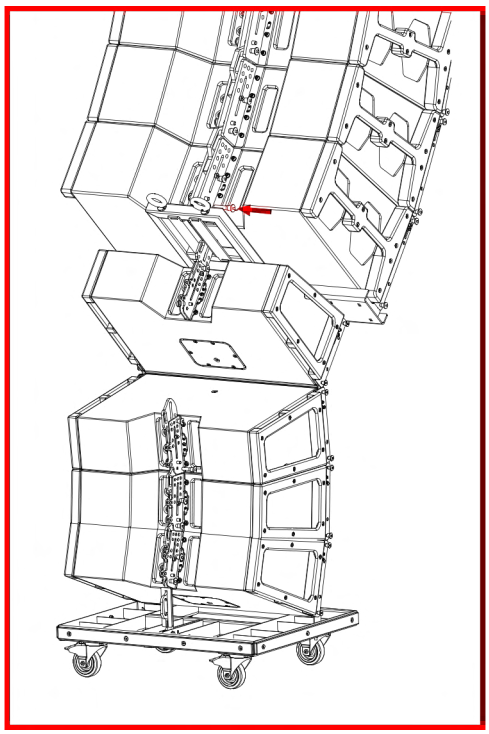
Remove the Rear Enclosure Link pin on the first HALO-B enclosure - this separates this enclosure at the rear from the 2nd in the stack on the WC-HALO-B.

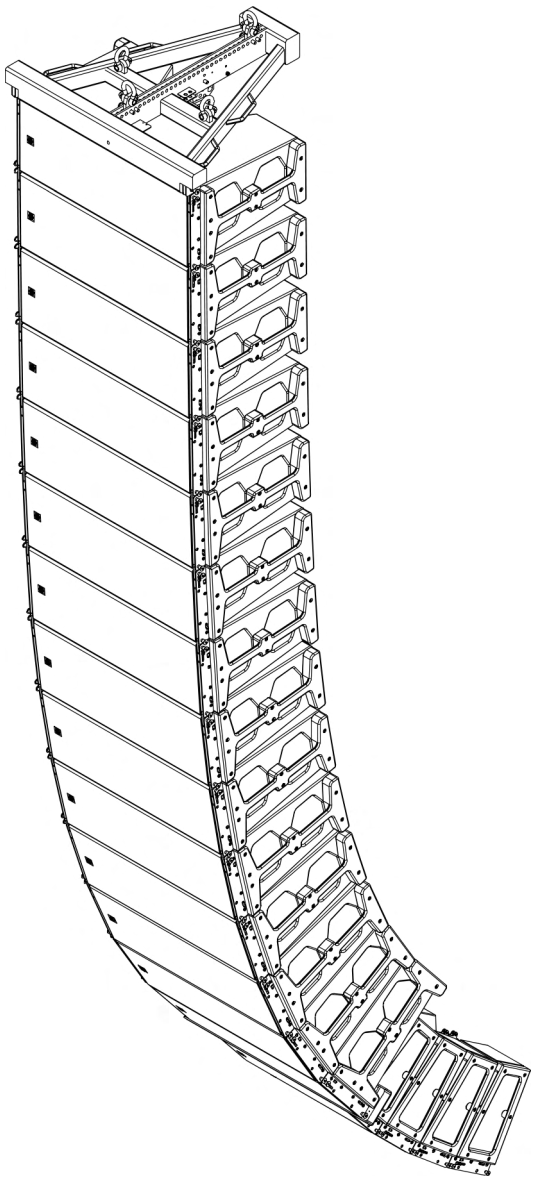


Step 10.

Lift the rear of the first HALO-B enclosure, pivoting it around the front rigging between the 1st and 2nd HALO-B elements. Continue to lift until the PB-HALO-A rear link engages in the receptacle for the Rear Link Attachment of the bottom HALO-A enclosure.

Insert the Rear Enclosure Link pin in the bottom HALO-A to secure the PB-HALO-A in place.



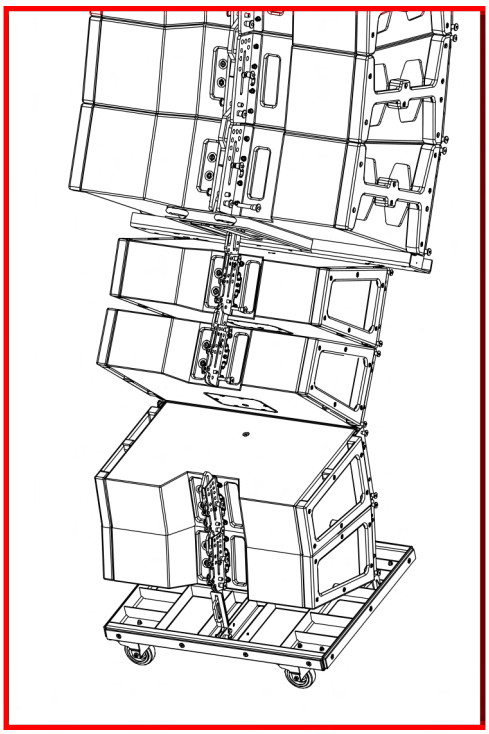


Step 11.

Repeat step 10 for the remaining enclosures on the WC-HALO-B cart.

As each enclosure is locked in place, use the Angle Set pin to ensure each element is correctly angled as per your EASE Focus simulation.

*Continue to repeat Step 10 up to a maximum of **six** HALO-B enclosures in the underhang.*

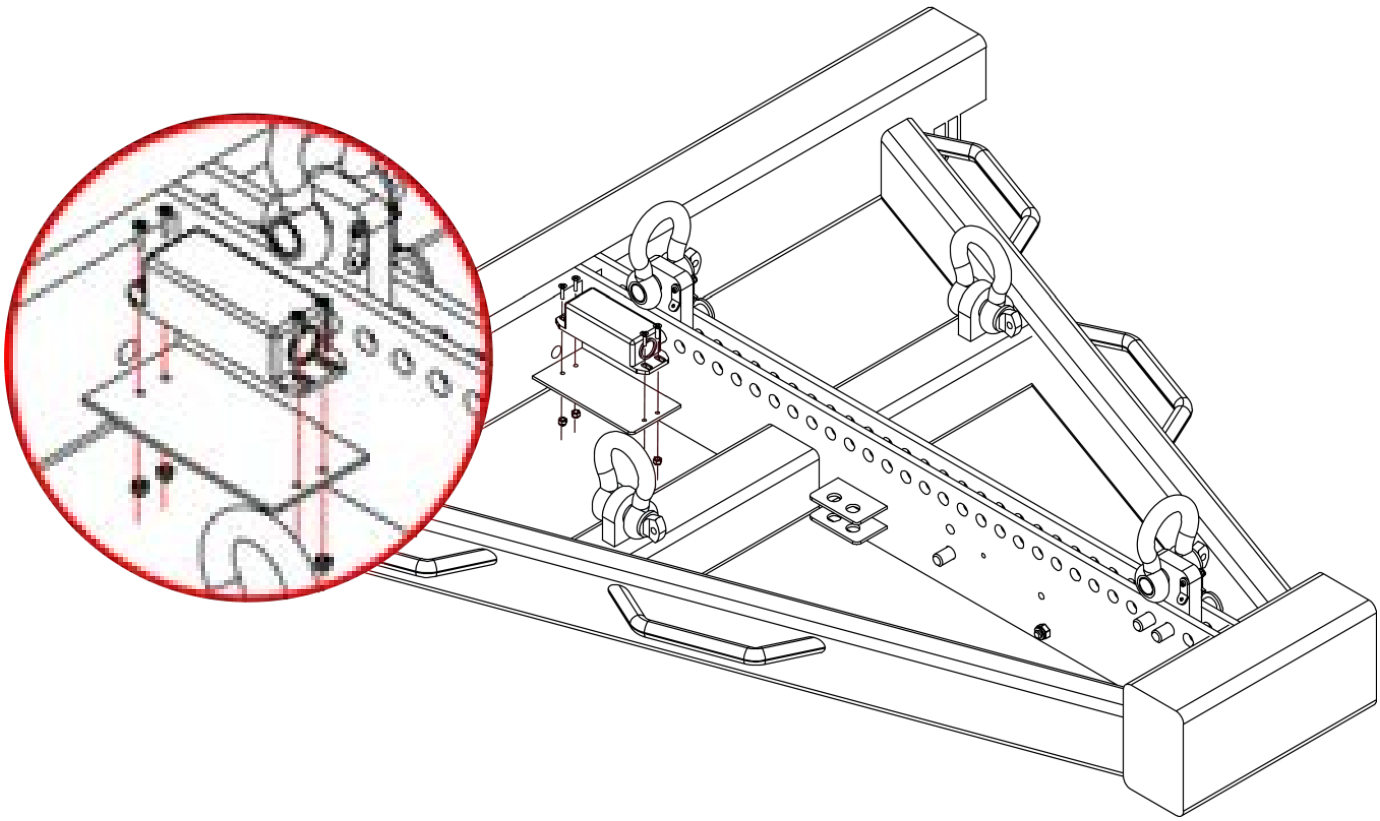


6.7 - Fitting an Inclinometer

TOOLS REQUIRED:
PZ1 screwdriver
7mm ring spanner

To fit an inclinometer – such as the LAP-TEQ system by TEQSAS - to the CG or FG-HALO-B you will require the four M4 countersunk machine screws and Nyloc nuts supplied with the the grid you are using.

Locate the inclinometer on the mounting plate, and insert the four screws as indicated. Secure them underneath with M4 Nyloc nuts, and tighten them accordingly.



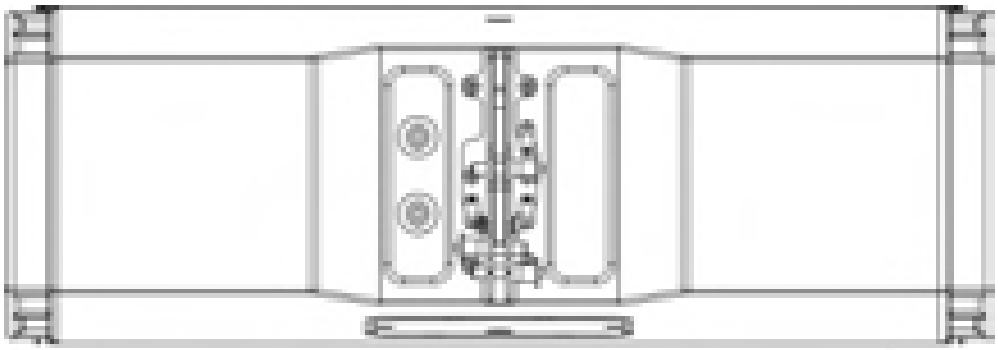
7.0 – Powering the System

The HALO B system is not just the loudspeakers, but the amplification and control package forms a vital part of the system for it to function as intended. The use of DQ or Di Series amplifiers provides a neat and flexible system that will encompass all requirements for the system to function correctly, as well as providing user control for room EQ and system alignment.

7.1 - Amplifier and Processing Requirements

7.1.1 - Connections

HALO B is a bi-amplified system – requiring two amplifier channels to drive it correctly and active processing on both channels to ensure the system performs as intended. Inputs to the HALO-B enclosure are on Neutrik SpeakON NL4 as illustrated below.



Four-core cable should be used for connecting HALO-B loudspeakers, and the connections are as follows:

SpeakON connection	1+	1-	2+	2-
Drive unit connection	LF +	LF -	HF +	HF –

7.1.2 - Connector Options

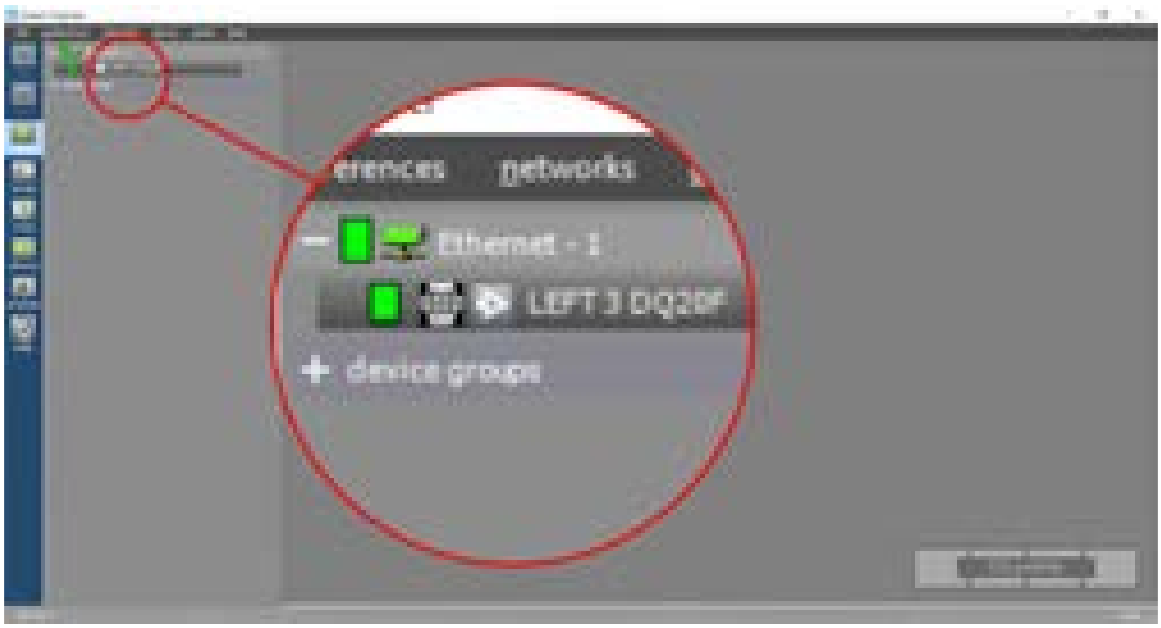
HALO B is supplied as standard with NL4TMP connectors, which form an IP54 rated connection when used with the STX series of SpeakON cable connectors. For more demanding environments, HALO-B can be supplied with Van Damme PA-CON connectors (male/female) which provide an IP65 connection rating when mated.

Other options may be possible by special order – please contact EM Acoustics to discuss your requirement.

7.1.3 - Amplifier Requirements

HALO-B makes ingenious use of FIR (Finite Impulse Response) filtering, allowing perfect alignment of the low and high frequency sections to ensure uniform coverage, near-perfect impulse & phase response and a significant reduction of off-axis parallax effects. As it is a turnkey system, HALO-B must be used with DQ Series amplifiers, however these must be the 2nd generation units equipped with FIR technology. Any amplifier supplied with your HALO-B system will be FIR-enabled, however for older units please check with EM Acoustics directly referencing the unit's serial number. Di Series installation amplifiers or the DSC48 DSP processor can also be used.

Alternatively, by connecting any DQ Series amplifier to the System Engineer software the FIR status can be determined – the device window on the left of the screen will display an "F" after the device name if they are FIR enabled – see example below.

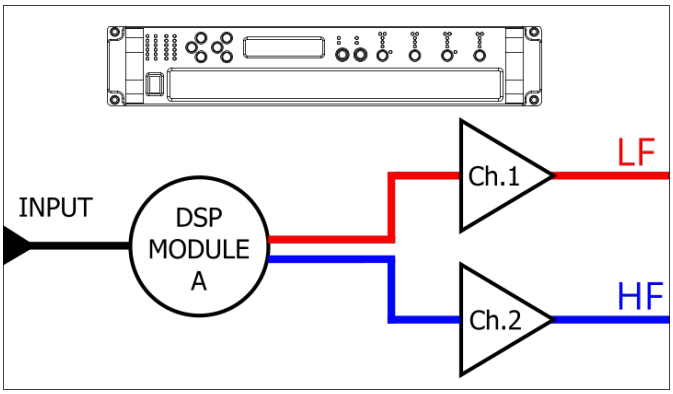


7.2 - Presets and Settings

7.2.1 - Preset Description

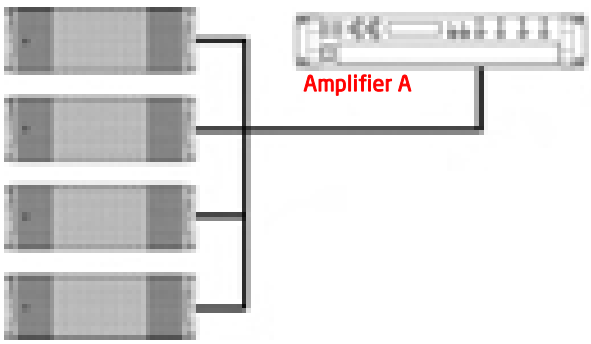
A variety of presets are provided within the DQ Series amplifiers to present a starting point for your system depending on the array size. Scope is available within the DQ Series processing for room EQ and system alignment, or alternatively a front-end processor could also be used to perform these duties.

These presets are two-channel presets, referred to as **module** presets. The diagram below illustrates how those presets work.



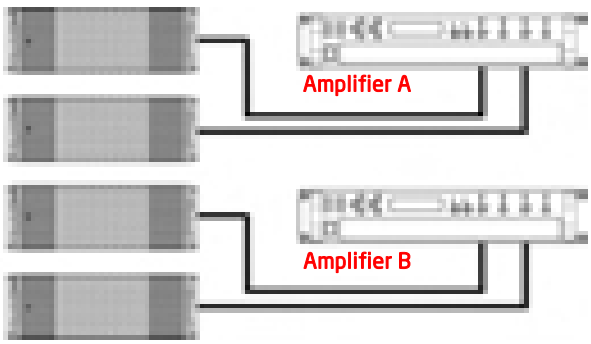
When selecting a preset, it is extremely important that the right preset is selected otherwise the system will not perform as expected. The presets are based around the **TOTAL NUMBER OF ELEMENTS IN THE ARRAY** – not the number of elements connected to each amplifier channel.

To illustrate below, both the system wiring configurations below of using four HALO-B would have the same preset recalled onto the DQ20 amplifier driving them.



Four HALO-B, wired in parallel
Driven from one biamp output of a DQ20 amplifier (2 channels)

Recall preset HALO-B.1-4 - preset for 1 to 4 enclosures - on one module of amplifier A

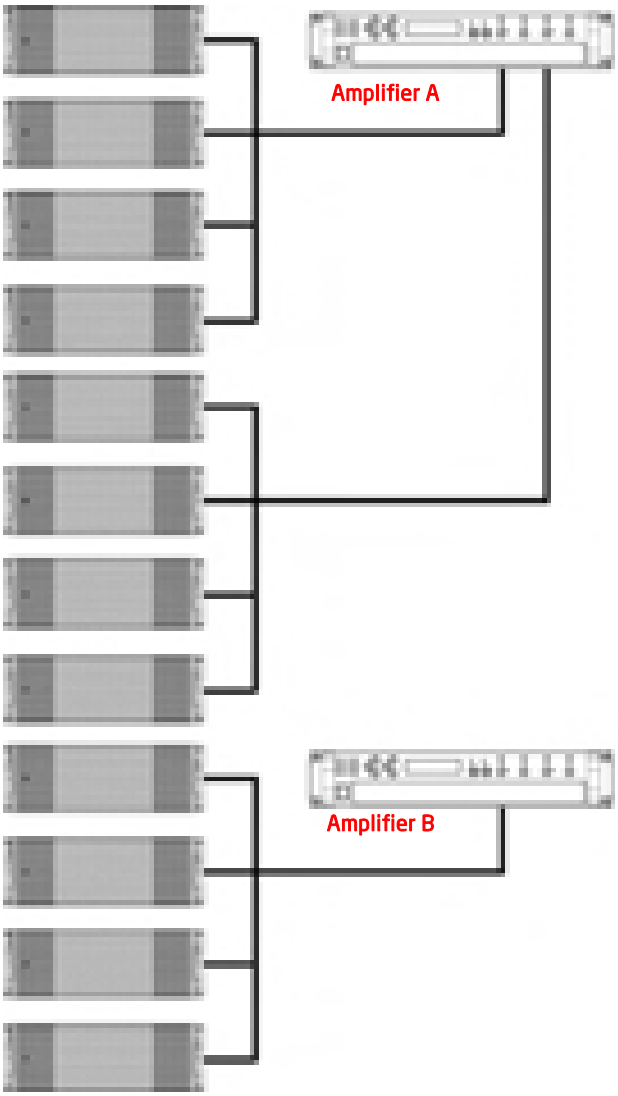


Four HALO-B, wired individually
Driven from four biamp outputs of two DQ20 amplifiers (4 x 2 channels)

Recall preset HALO-B.1-4 - preset for 1 to 4 enclosures - on one module of amplifier A and one module of amplifier B

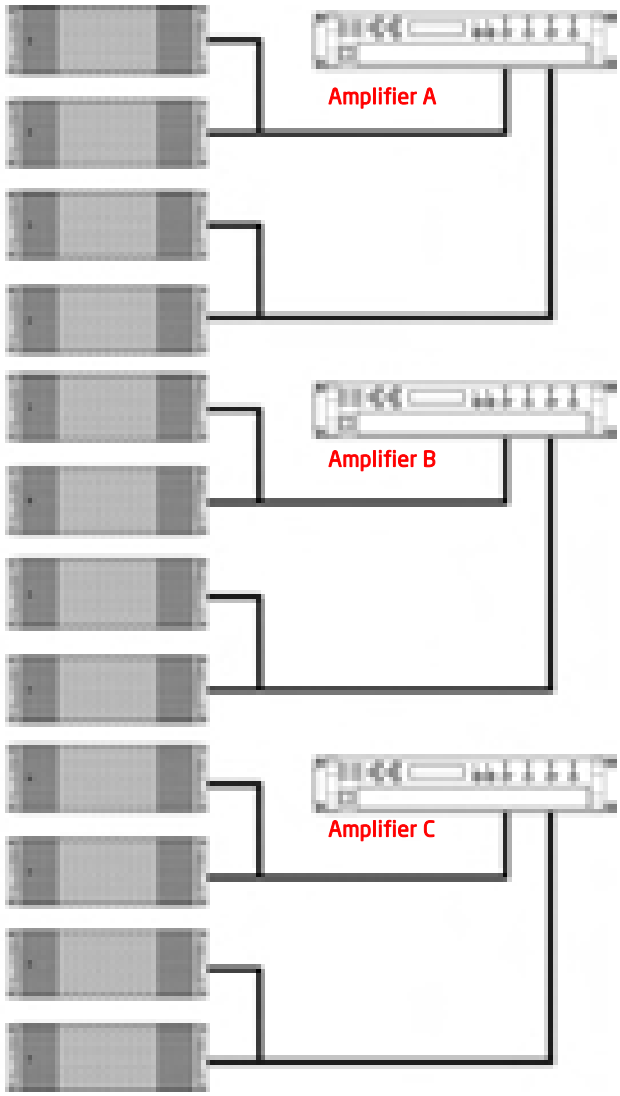
As illustrated, both examples above would use the same preset file recalled into the amplifier, all that is different is the number of amplifier channel pairs required – all of which require the same preset recalled.

The system example below is also intended to illustrate how the preset relates to the length of the array, not the number of enclosures connected to the amplifier channel.



Twelve HALO-B, wired as three groups of four in parallel
Driven from three biamp outputs of two DQ20 amplifiers
(3 x 2 channels)

Recall preset HALO-B.9-16 - preset for 9 to 16 enclosures - on two modules of amplifier A, and one module of amplifier B



Twelve HALO-B, wired as six groups of two in parallel
Driven from six biamp outputs of three DQ20 amplifiers (6 x 2 channels)

Recall preset HALO-B.9-16 - preset for 9 to 16 enclosures - on all modules of amplifiers A, B & C

As illustrated, regardless of the combination of amplifiers used, or how the loudspeakers are wired, the preset to be recalled is determined by the number of elements in the array.

7.2.2 - FIR Latency

FIR processing, like any digital processing system introduces latency due to the processing time. The latency imposed by the FIR processing is **4 milliseconds**, and this should be taken into account when determining geometric delays based on your system configuration.

7.2.3 - Geometric Delay

To ensure your system performs as intended, appropriate delay will need to be added to different elements to ensure everything is correctly time-aligned – for example aligning subwoofers to the main array hangs. This delay is determined by both geometric position and filter slopes applied. Use of a measurement tool such as SMAART will help to align your system.

It is of paramount importance that any delay applied to a line array hang, is applied to the *entire* hang – if delay is only applied to one part of the array (for example only on amplifier A in the example on the previous page) then the array would not perform acoustically as it should, and performance will be wildly different to what was simulated. As such it is always best to apply this delay on the input side of the amplifier (for example in the FOH desk, overall system processor if present, or in the input DSP of the DQ Series unit), or if using multiple amplifiers then to group Modules together in System Engineer software so the delay can be applied and adjusted identically on all relevant modules.

7.2.4 - Applying EQ

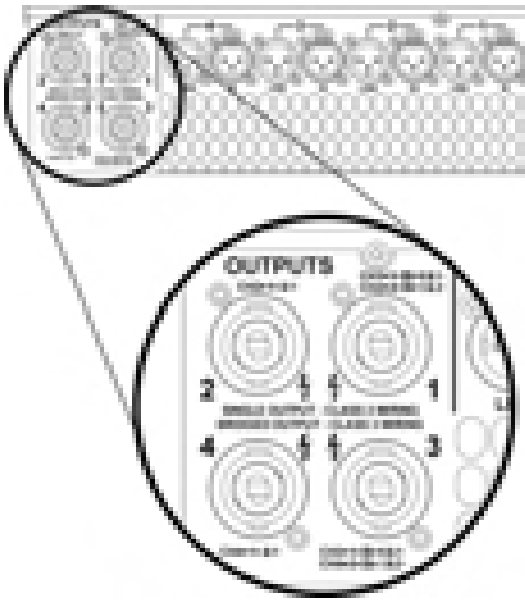
The presets are intended to be a starting point for your system, and will almost certainly require tuning on-site dependent on room characteristics, the rest of your system design and the system voicing you are aiming for. HALO-B is designed with a significant amount of system headroom, so applying EQ is perfectly acceptable.

EQ filters add group delay into a system, and as such just as with delay above, it is imperative that the same EQ filter is applied across the entire array to ensure that the system still performs as a line array. EQ filters applied to only one section of an array will impose a group delay on that part of the system, which will bring further acoustical issues.

7.3 - Use with the DQ Series Advanced System Amplifiers

HALO-B requires the proprietary DQ or Di Series of Advanced System Amplifiers to function correctly and should not be used with any other amplifier or processor combination. The information below details configuring a DQ Series amplifier for HALO-B enclosures specifically. Please refer to the relevant amplifier User Manual for detailed information on using the amplifiers and the System Engineer software.

7.3.1 - Connections



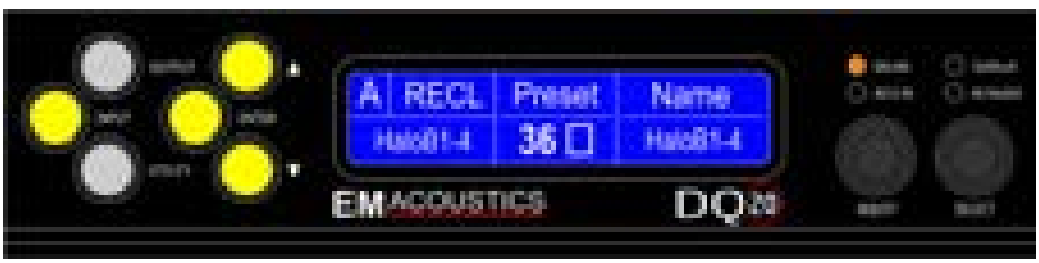
The four amplifier channels appear on four speakON connectors on the rear of the DQ Series amplifiers. HALO-A is a biamplified system and as such requires two amplifier channels. For convenience, the connectors for outputs 1 & 3 also carry outputs 2 & 4 respectively on the 2+/2- pins. So, 4-core cables can be used directly from connectors 1 and/or 3 to connect HALO-B elements

7.3.2 - Preset Recall

The family of HALO-B presets are pre-installed on EM Acoustics' amplifiers, and as such they can be used following the normal preset recall procedure. As detailed above, recall the preset that relates to the size of the array hang, not the number of elements per channel. The presets available are:

HALOB.1-4	1-4 element array size
HALOB.5-8	5-8 element array size
HALOB.9-16	9-16 element array size
HALOB.17-24	17-24 element array size.

As mentioned above, these presets are intended to be a starting point and additional work may be required depending on the venue, the style of content and the end result you are looking for.



7.4 - System Connectivity

7.4.1 - Maximum number of elements per amplifier

In order to achieve the designed headroom and output from your HALO-B system, sufficient amplifier power must be available. All DQ Series (DQ6, DQ10 and DQ20) or Di Series (Di06, Di10, Di20) can be used to drive HALO-B, however due to their available output power, the number of elements that can be driven per amplifier varies.

HALO-B

Amplifier Model	*Max. enclosures in parallel*	*Max enclosures per amplifier*
DQ6	1	2
DQ10	2	4
DQ20	4	8
Di06*	1	2
Di10	1	2
Di20	2	4

It is strongly advised not to mix amplifier types within a single array. HALO-B is designed to work effectively with all EM Acoustics' amplifiers.

*** - Due to the lower output power, whilst the Di06 will work with HALO-B, it will significantly limit the available output and as such its use is not recommended.**

7.4.2 - Cable Length and Specification

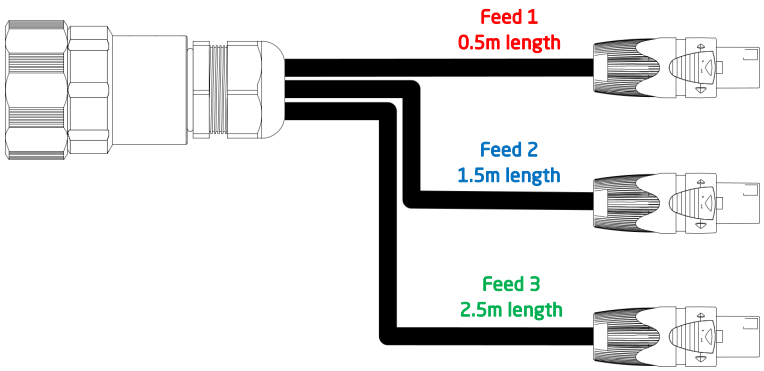
All cables add to the system impedance, and as such careful selection is required depending on your amplifier setup and overall system impedance. Cables with a cross sectional area of less than 2.5mm^2 should not be used. Recommended maximum cable lengths are given below:

Conductor Area	Maximum Recommended Cable Length		
	2 ohms	4 ohms	8 ohms
2.5mm^2 (14 AWG)	15m	30m	60m
4.0mm^2 (12 AWG)	20m	40m	80m
6.0mm^2 (10 AWG)	30m	60m	120m

7.4.3 - Available Cable Accessories

There are a number of bespoke cable assemblies which can be supplied by EM Acoustics to ensure correct wiring for your system, both using DQ Series amplifiers alone and also using the DQRack touring solution.

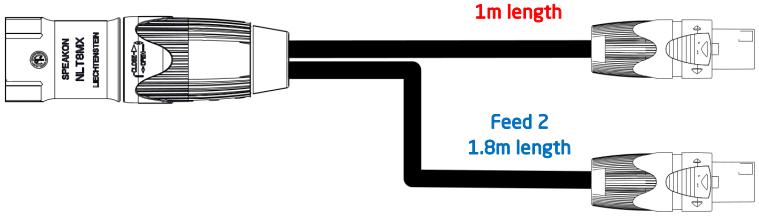
SPLIT-HALO-B-19P



19-pole pin	Feed & Connection
1	Feed 1, 1+
2	Feed 1, 1-
3	Feed 1, 2+
4	Feed 1, 2-
5	Feed 2, 1+
6	Feed 2, 1-
7	Feed 2, 2+
8	Feed 2, 2-
9	Feed 3, 1+
10	Feed 3, 1-
11	Feed 3, 2+
12	Feed 3, 2-
13-19	No connection

Intended for use with 19-pole circular connectors such as Socapex, the SPLIT-HALOB-19P assembly gives three 4-core cable sends, on NL4 connectors, with appropriate cable lengths to allow each feed to connect to four HALO-B elements in parallel. This assembly is intended for use at the loudspeaker end of the cable run.

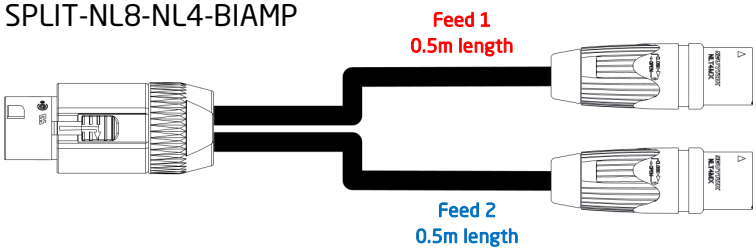
SPLIT-HALO-B-NL8



NL8 pin	Feed & Connection
1+	Feed 1, 1+
1-	Feed 1, 1-
2-	Feed 1, 2+
2-	Feed 1, 2-
3+	Feed 2, 1+
3-	Feed 2, 1-
4+	Feed 2, 2+
4-	Feed 2, 2-

Intended as an array connector when using NL8 cables, the SPLIT-HALOB-NL8 assembly gives two 4-core cable sends, on NL4 connectors, with appropriate cable lengths to allow each feed to connect to four HALO-B elements in parallel. This assembly is intended for use at the loudspeaker end of the cable run.

SPLIT-NL8-NL4-BIAMP

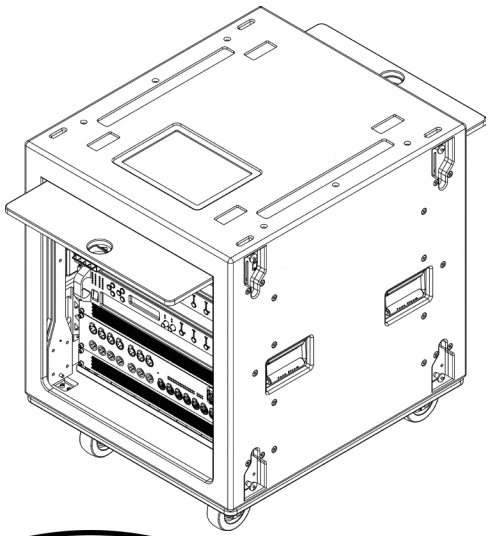


NL8 pin	Feed & Connection
1+	Feed 1, 1+
1-	Feed 1, 1-
2-	Feed 1, 2+
2-	Feed 1, 2-
3+	Feed 2, 1+
3-	Feed 2, 1-
4+	Feed 2, 2+
4-	Feed 2, 2-

Intended to split NL8 connections into two biamplified feeds, SPLIT-NL8-NL4-BIAMP gives two 4-core cable sends, on male NL4 sockets. This assembly is intended for use at the amplifier end of the cable run.

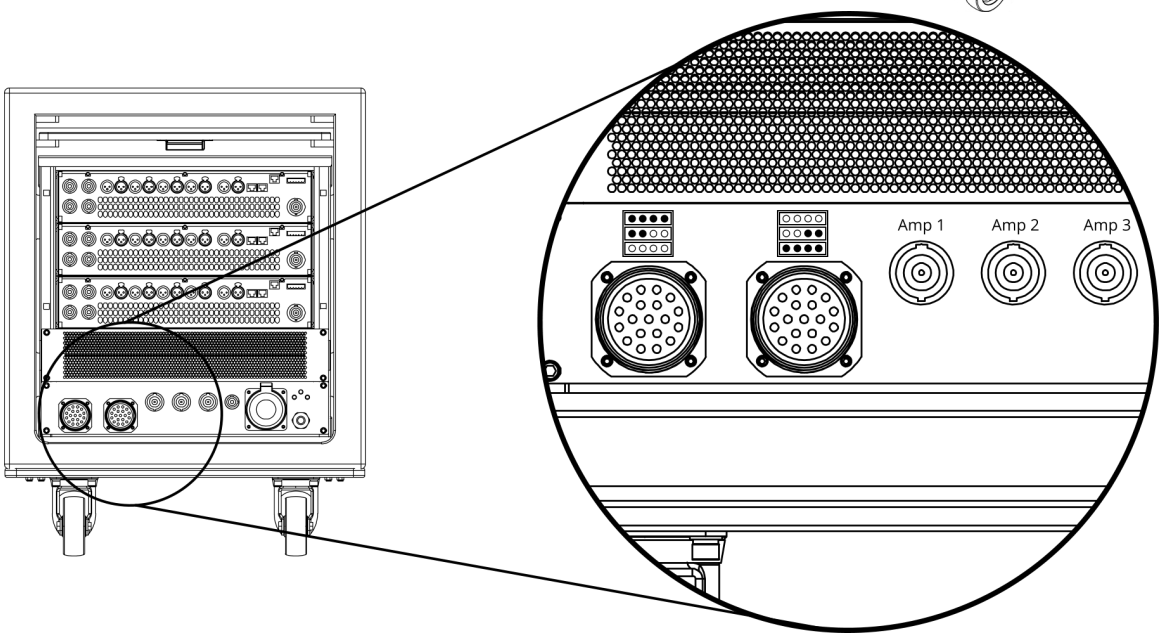
7.5 - Use with the DQRack

7.5.1 - DQRack Overview



The DQRack is EM Acoustics' flagship touring amplification and control solution. 12 channels of premium quality Class D amplification with full onboard DSP and Dante connectivity, packaged with a bespoke I/O solution for signal, data, loudspeaker outputs and mains power. The DQRack is the optimum solution for touring environments and provides an optimum turnkey solution.

The DQRack has two loudspeaker output options, depending on your chosen cabling method.



Each of the two 19-pole connectors delivers 6 channels of amplifier power, as identified from the legend on the output panel.

The 19-pole connectors are wired in parallel to the three NL8 connectors, each of which delivers the four outputs from each amplifier.

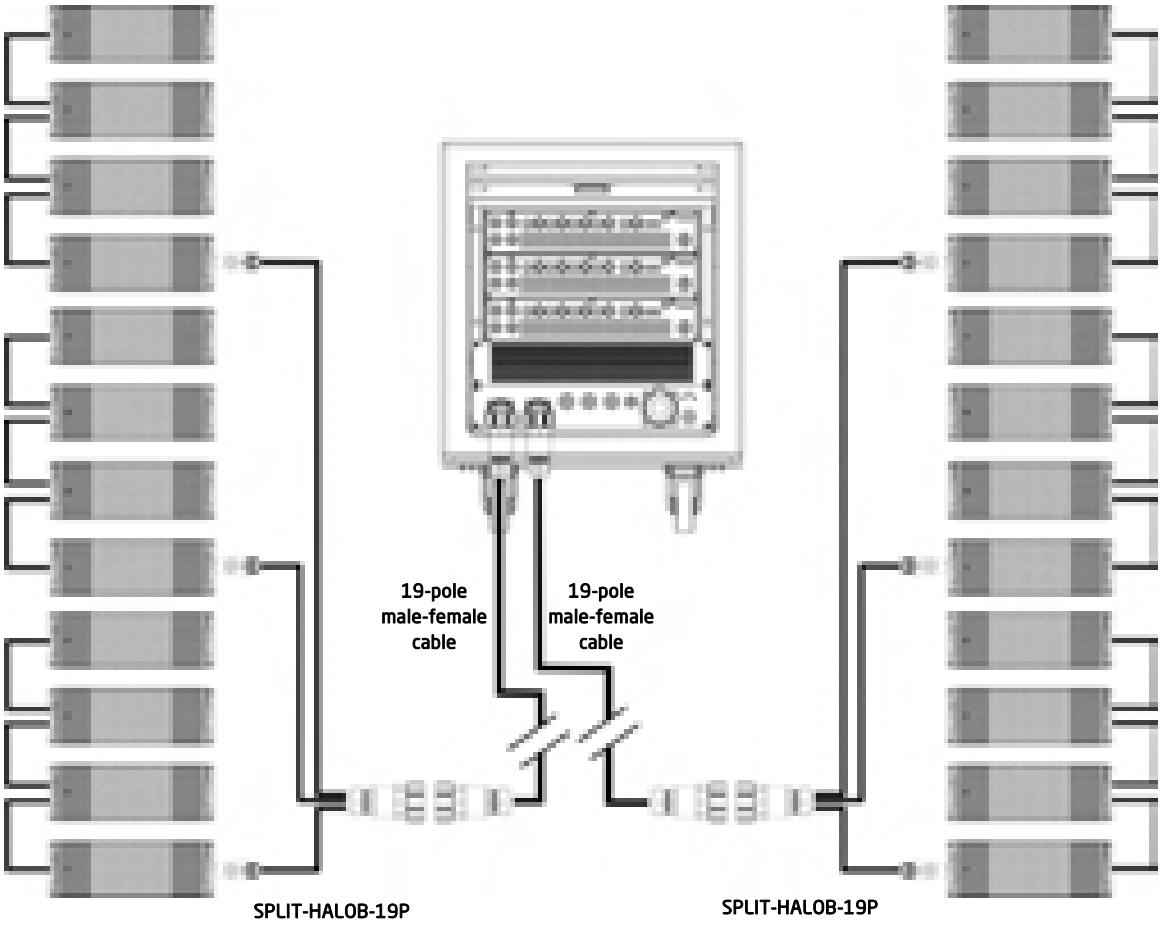
Detailed below are some examples of how you can use the DQRack to power a system appropriately in a touring environment, and the various accessories and other parts that would be required.

7.5.2 - System Examples with the DQRack

The example below illustrates the maximum HALO-B capacity that can be run from a DQRack. Using the two 19-pole outputs, each of three feeds per connector drives four HALO-A in parallel. The two arrays shown in this image could be one large 24-element hang, the cabling principle would be the same.

Parts required:

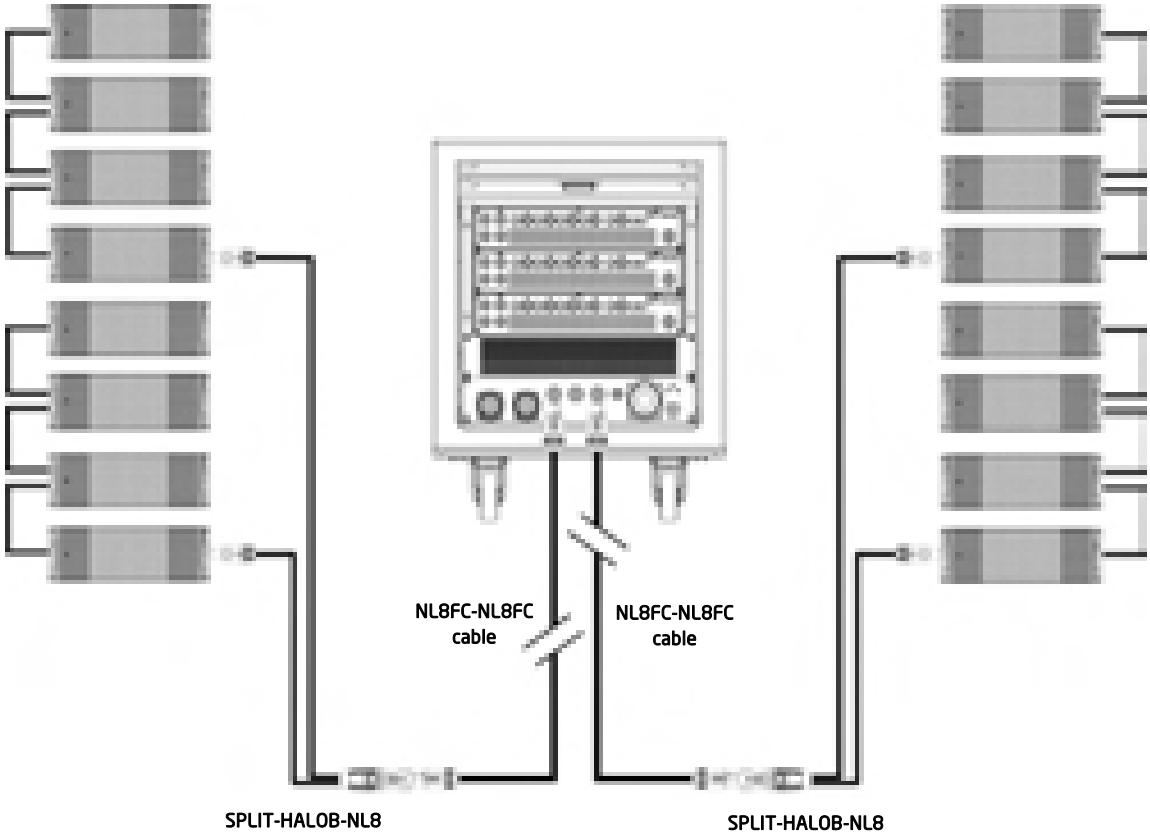
24 x HALO-B enclosure
1 x DQRack
2 x SPLIT-HALOB-19P
2 x male-female 19-pole connector cables (16 cores minimum) of suitable length
18 x NL4-NL4 (4-core cable) link cables – optimum length 0.5m



The example below shows the use of the SPLIT-HALOB-NL8. The example below loads amplifiers 1 and 3 to their maximum capacity, and leaves amplifier 2 spare for subwoofers, front fills or other loudspeakers.

Parts required:

16 x HALO-B enclosure
1 x DQRack
2 x SPLIT-HALOB-NL8
2 x NL8FC-NL8FC cables (8-core cable) of suitable length
12 x NL4-NL4 (4-core cable) link cables – optimum length 0.5m



Many other combinations are possible, using the various adapters available – splits can be put in place either near the DQRack or near the loudspeakers, depending on what is required in your setup configuration.

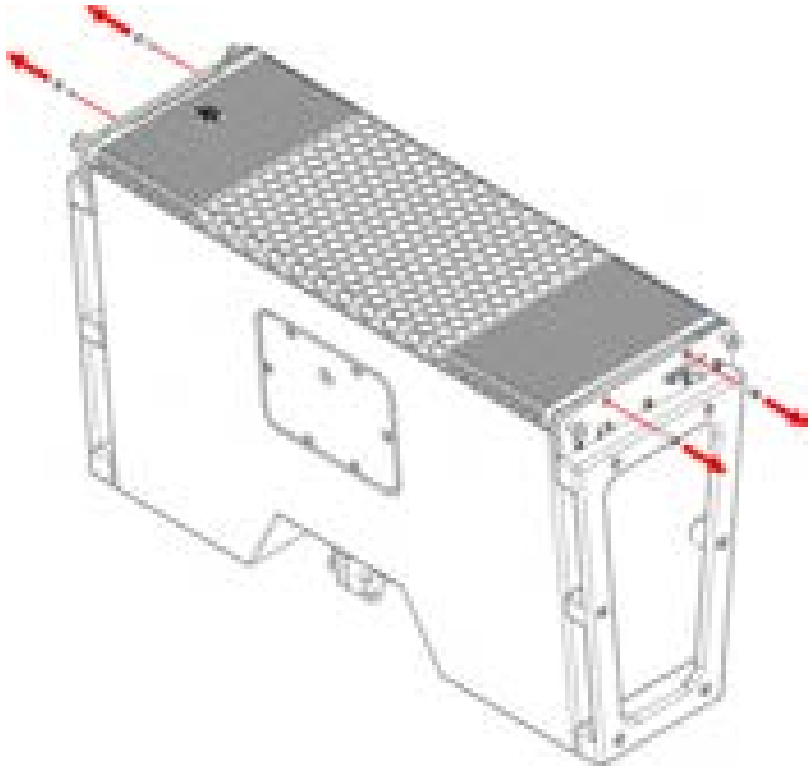
8.0 – Servicing Information

All HALO B components can be removed for service purposes if required, using the minimum of tools.

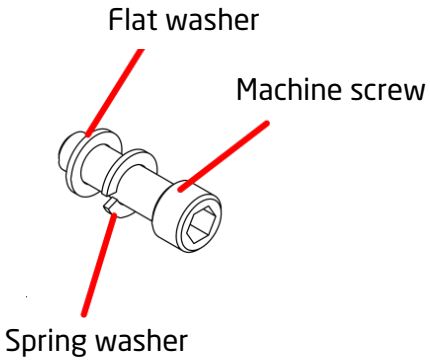
8.1 - HALO-B: Removing the grille

TOOLS REQUIRED: 5mm Allen key

1. Lie the enclosure on its' back and remove the two M6x20 socket cap screws in each end of the grille. Ensure to collect the washers (flat and spring) from the screw recess, and then lift the grille clear of the cabinet.



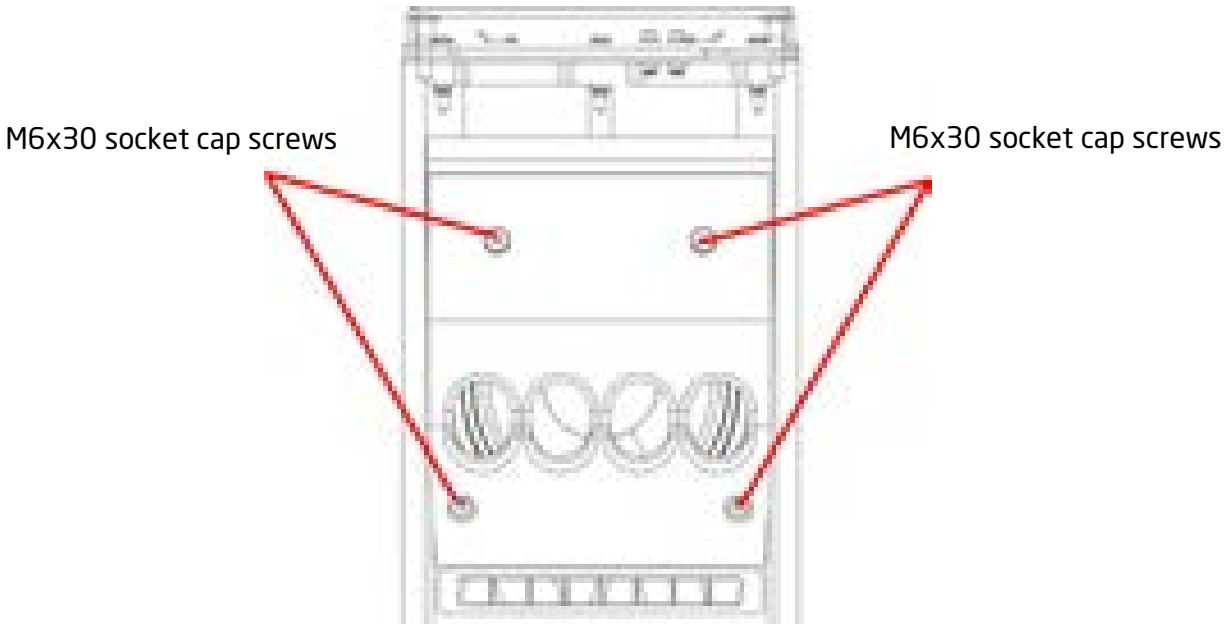
2. To replace the grille, first check that the foam gaskets on each end and on the long edges are complete and intact - replace these if necessary. Position the grille on the front of the HALO-B (logo badge should be on the left of the enclosure when in a flown configuration) and ensure the threaded fittings on the grille are lined up with the mounting holes. Replace each of the four M6x20 socket cap screws (with their washers – the spring washer should be sandwiched between the flat washer and the bolt head) and ensure all four machine screws are started in their threads before beginning to tighten. Ensure they are all tightened evenly so that the grille sits straight and flat and does not rattle.



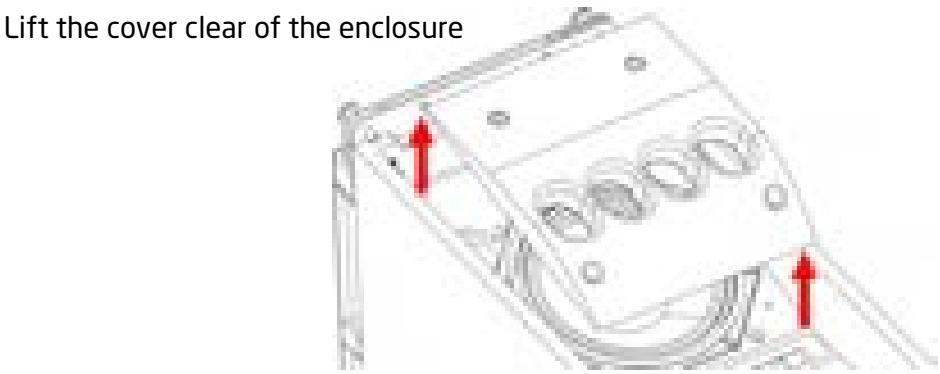
8.2 - HALO-B: Removing waveguide/LF drive unit covers

TOOLS REQUIRED: 5mm Allen keys

1. Complete step 8.1 above to remove the grille.
2. Using a 5mm Allen key, remove the four M6x30 socket cap screws that secure the external edge of the waveguide/drive unit cover part. Ensure that you remove the flat washers from the recesses as well as the machine screws.



3. Lift the waveguide/drive unit cover part clear of the enclosure. Be aware that there are self-adhesive gaskets on the mating surface, and these can help the part stick to the enclosure – remove carefully. Repeat the procedure to remove the other cover if necessary.



4. To replace the part, first check that the mating surface gaskets are complete and intact – replace these if necessary. Position the waveguide/drive unit cover over the LF drive unit, and check the mounting holes line up in all locations. Replace the relevant machine screws with their washers and ensure every screw has started turning smoothly in its thread prior to tightening. Check that the throat edge is not overhanging the HF drive unit exits, and then begin to tighten.

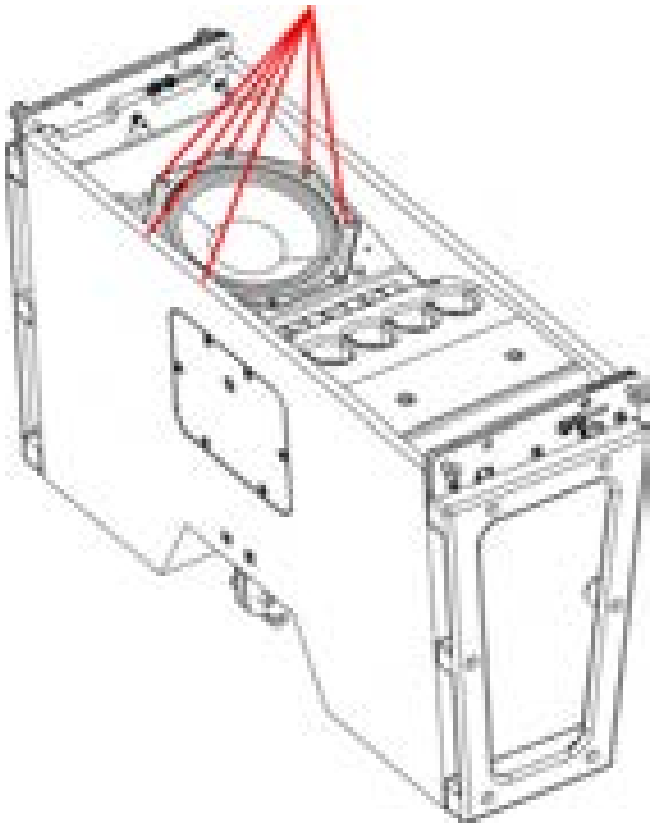
8.3 - HALO-B: Removing the LF Drive Unit

TOOLS REQUIRED: 4mm & 5mm Allen keys

1. Follow steps 8.1 & 8.2 above to remove the grille, and the waveguide/drive unit cover over the drive unit you need to remove.

2. Using a 4mm Allen key, loosen and remove the six M5x30 socket cap screws holding the drive unit in place. Be aware there is a spring washer with each bolt which needs to be retained.

6pcs M5x30 socket cap machine screws with spring washers



3. There is a simple finger groove to assist in removing the drive unit from its recess.

4. Lift the drive unit clear of the mounting hole and disconnect the two cables – note the polarity for reconnection.

5. To replace the drive unit, first sit a fresh gasket in the drive unit recess, ensuring that the holes line up with the cabinet mounting holes. Reconnect the cables to the drive unit (note the brown cable goes to the positive (red) terminal, and the blue cable goes to the negative (black) terminal on the drive unit) and then sit the drive unit in the recess, ensuring that the mounting holes line up.

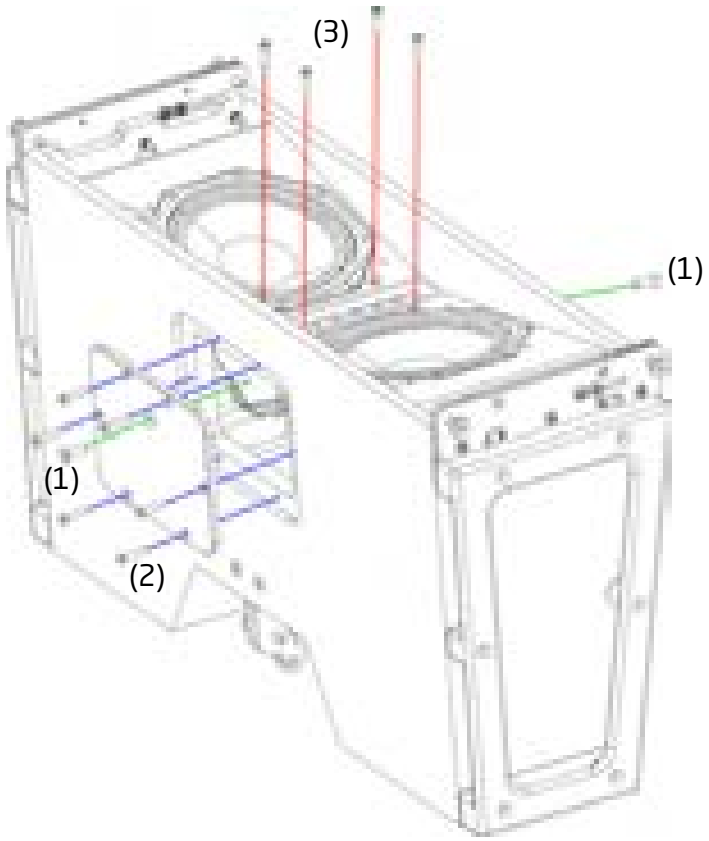
6. Replace the M5x30 socket cap machine screws with their spring washers and ensure all machine screws are started in their threads before tightening. Tighten opposing bolts, working around the drive unit until all bolts are appropriately tightened.

7. Replace the waveguide/drive unit cover parts and the grille as described above.

8.4 - HALO-B: Removing the HF assembly

TOOLS REQUIRED: 4mm & 5mm Allen key

1. Follow steps 8.1 & 8.2 above to remove the grille and both waveguide/drive unit cover parts.



2. Using a 5mm Allen key, remove the single M8x20 countersunk socket head machine screw on each side – one in the centre of the access door, and one on the opposite face (labelled (1) above). Then, using a 4mm Allen key, remove the six M6x20 countersunk socket head screws so that the access door can be removed (labelled (2) above). Reach into the enclosure past the HF assembly and disconnect the white & yellow twist cable from the input circuit board on the back panel of the cabinet, leaving it attached to the HF assembly.

3. Lie the enclosure down on its side with the access door upwards. Using a 5mm Allen key, undo the four M6x25 socket cap machine screws through the front of the loudspeaker (labelled (3) above) to release the HF assembly. Once the HF assembly is completely released, it can be removed through the access door.

4. To replace the HF assembly, first check that all cables from the drive units are correctly connected, and the sealing gasket around the front face is intact – replace if necessary. Lower the HF assembly through the access door and locate it within the recess in the front of the enclosure. Replace the four M6x25 socket cap machine screws – with their flat and spring washers as detailed in 8.1 above – through the front location holes and tighten with a 5mm Allen key to pull the HF assembly tight into its recess.

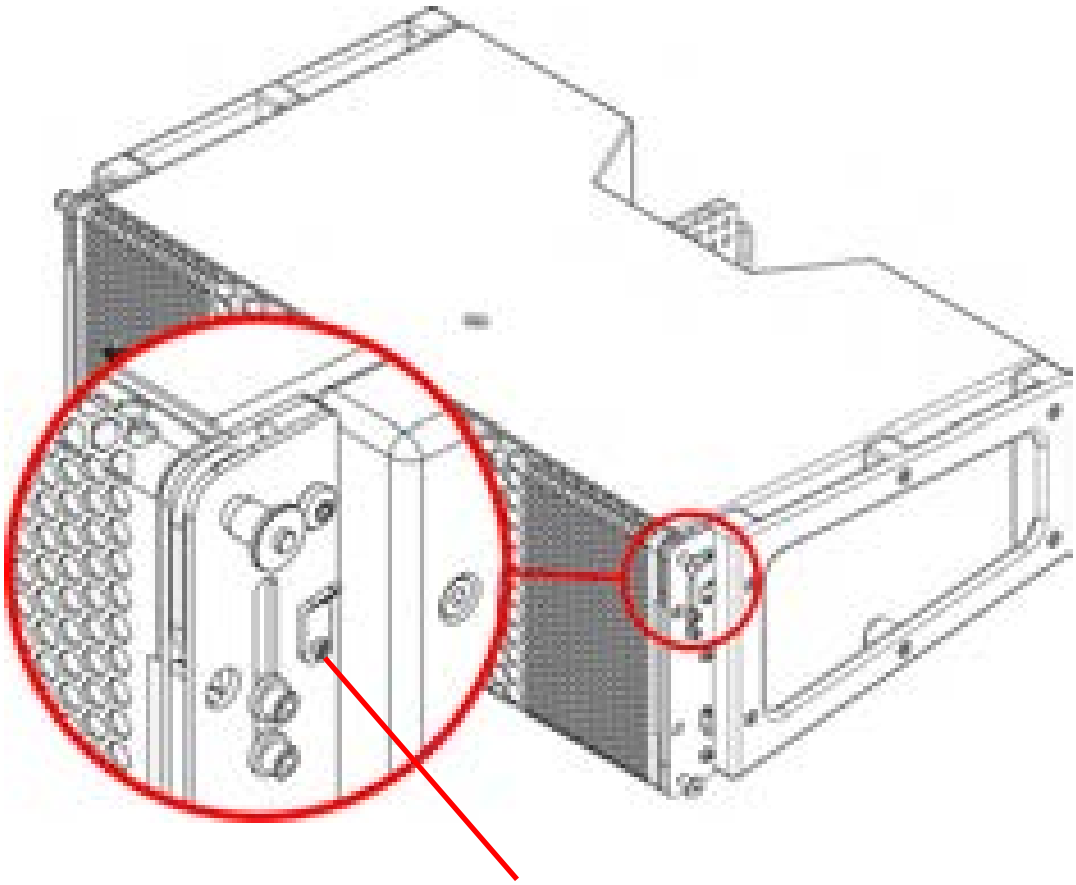
5. Stand the enclosure on its back. Check the gasket on the access door is complete and intact and replace if necessary. Locate the access door back in position and replace all the machine screws. Ensure that all machine screws (M6 **and** M8) are started in their threads before tightening any. Once all the screws are started, tighten them all to complete the process.

6. Replace the waveguide/drive unit cover parts, and the grille as described above.

8.5 - HALO-B: Replacing a Front Rigging flying pin

TOOLS REQUIRED: 2.5mm Allen key

1. The front rigging flying pins are held in place by M3 socket cap machine screws, with captive Nyloc nuts within the assembly. As such, they can be easily removed and replaced in the field. Using a 2.5mm Allen key, undo the machine screw to remove it.



M3 socket cap screw securing pin lanyard tab

2. To replace, simply reverse the procedure and tighten the machine screw appropriately.

8.6 HALO-B: Replacing a Splay Rigging flying pin

1. The nuts that secure the pin lanyard tabs on the splay rigging assembly are **not** captive – and as such the splay rigging assembly needs to be removed from the enclosure to replace these pins.

   It is imperative that you contact EM Acoustics before attempting this for detailed instructions and relevant replacement machine screws, as removing the rear rigging assembly is a potential safety issue.

Appendix A – Technical Specifications

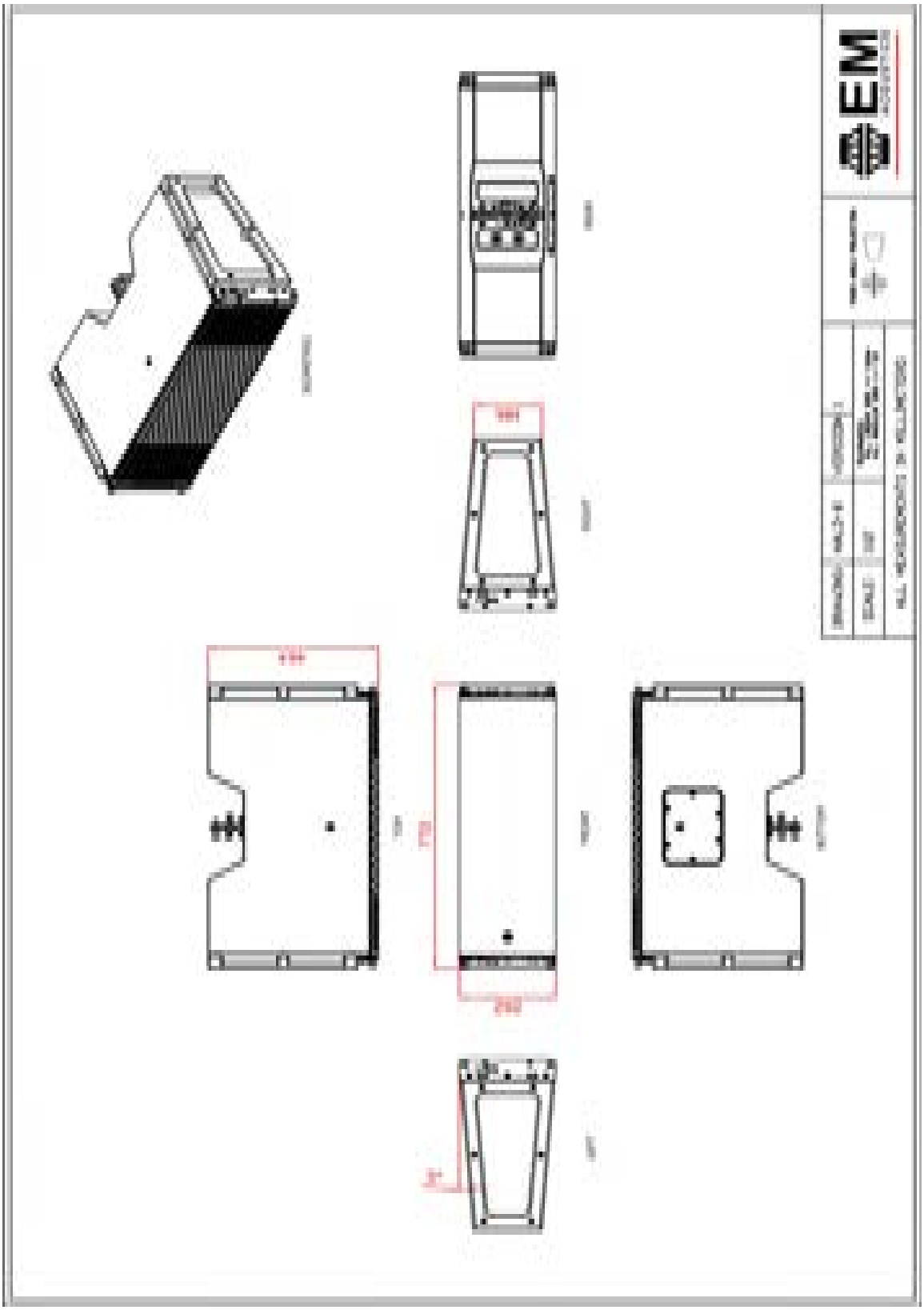
HALO-B 2-way medium format line array element

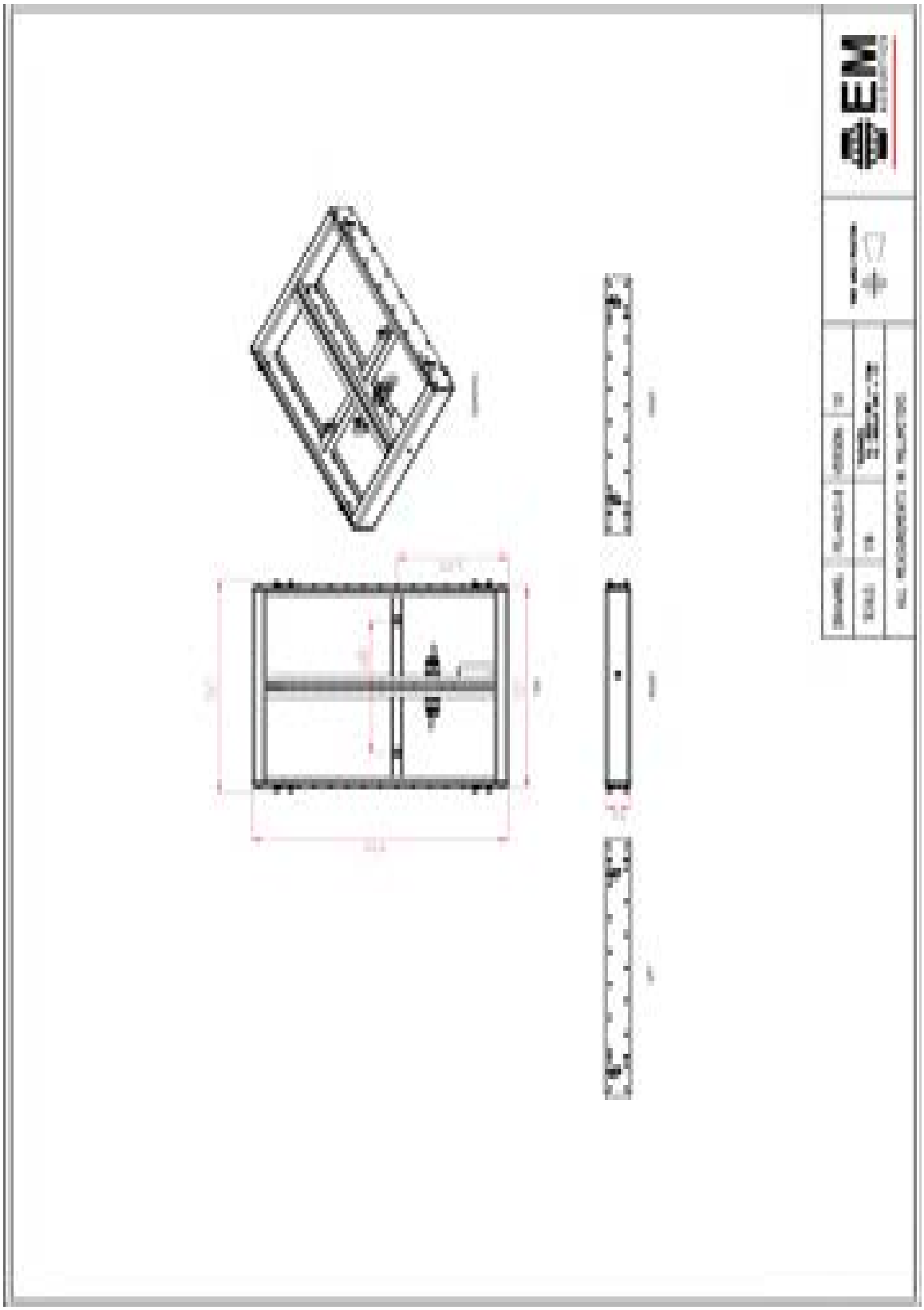
Dimensions (HxWxD) :	262 x 772 x 464mm (10.3" x 30.4" x 18.3")
Net/Shipping Weight:	29kg/32kg (63.8lbs/70.4lbs)
Frequency Response (+/- 3dB)[1]:	65Hz – 20kHz
Dispersion[3]:	Horizontal (-6dB) 110 degrees Vertical (-6dB) Dependent on array settings
Drive Units:	2 x 2.5" (64mm) voice coil 8" (203mm) neodymium LF drive unit 4 x 1.5" (38mm) diaphragm, 1" (25mm) exit neodymium HF drive unit on bespoke plane-wave manifold
Power Handling:	LF: 600W RMS, 1200W program HF: 140W RMS, 280W program
Maximum SPL:	135dB continuous, 141dB peak
Nominal Impedance:	LF: 8 ohms HF: 16 ohms
Crossover:	External active
Enclosures per amplifier:	DQ6: 2 DQ10: 4 DQ20: 8
Connectors:	2 x Neutrik SpeakON™ NLT4MP
Enclosure:	15/30mm (5/8" & 1 3/16") multi-laminate birch plywood, rebated, screwed and glued. Finished in polyurethane textured finish
Rigging & Hardware:	3-point system, ultra-high tensile steel. Finished in Xylan™ protective coating. Rated to 24 elements at 10:1 safety factor. Splay angles 0.25, 0.5, 1, 1.5 and 3-10 degrees
Grille:	Powder coated stainless steel, fabric backed
Options:	Colours/Connectors
Accessories:	FG-HALO-B master flying grid / CG-HALO-B compact flying grid EXT-HALO-B extension beam SM-HALO-B simple mounting frame PB-HALO-A pullback/underhang frame (for underhanging from HALO-A) GS-HALO-B ground stacking adapter frame WC-HALO-B quad enclosure transit wheelcart TC-HALO-B quad enclosure padded transit cover

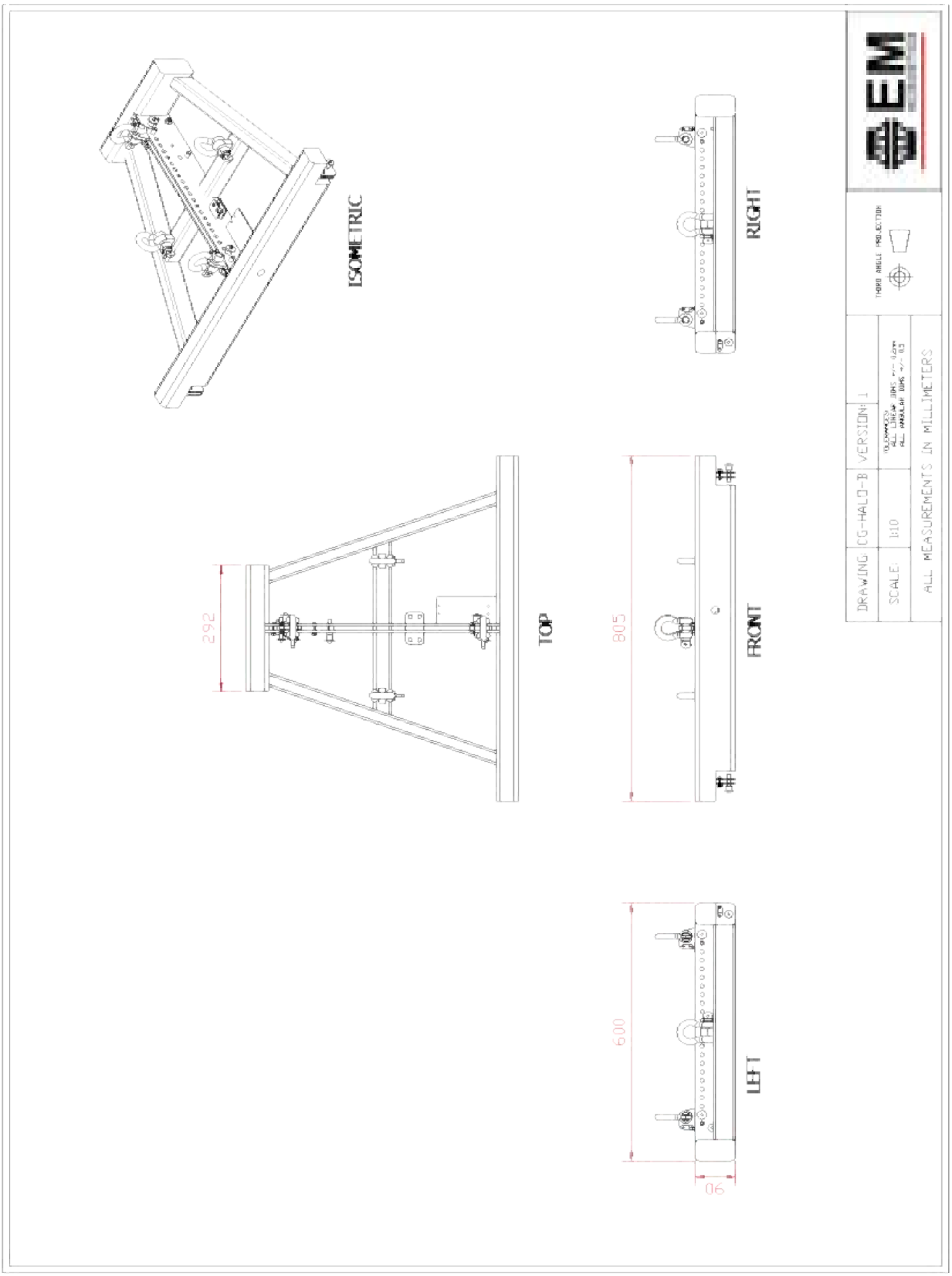
Notes on measurement conditions:

[1]Measured on-axis at 2m in an anechoic environment and referenced to 1m. [2]Measured in half-space at 2m with 4W sine wave input and referenced to 1m. [3]Nominal dispersion, measured in an anechoic environment and averaged over stated bandwidth. [4]Calculated and verified by subjective listening test of familiar program material.

Appendix B – Technical Drawings






ISOMETRIC
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292
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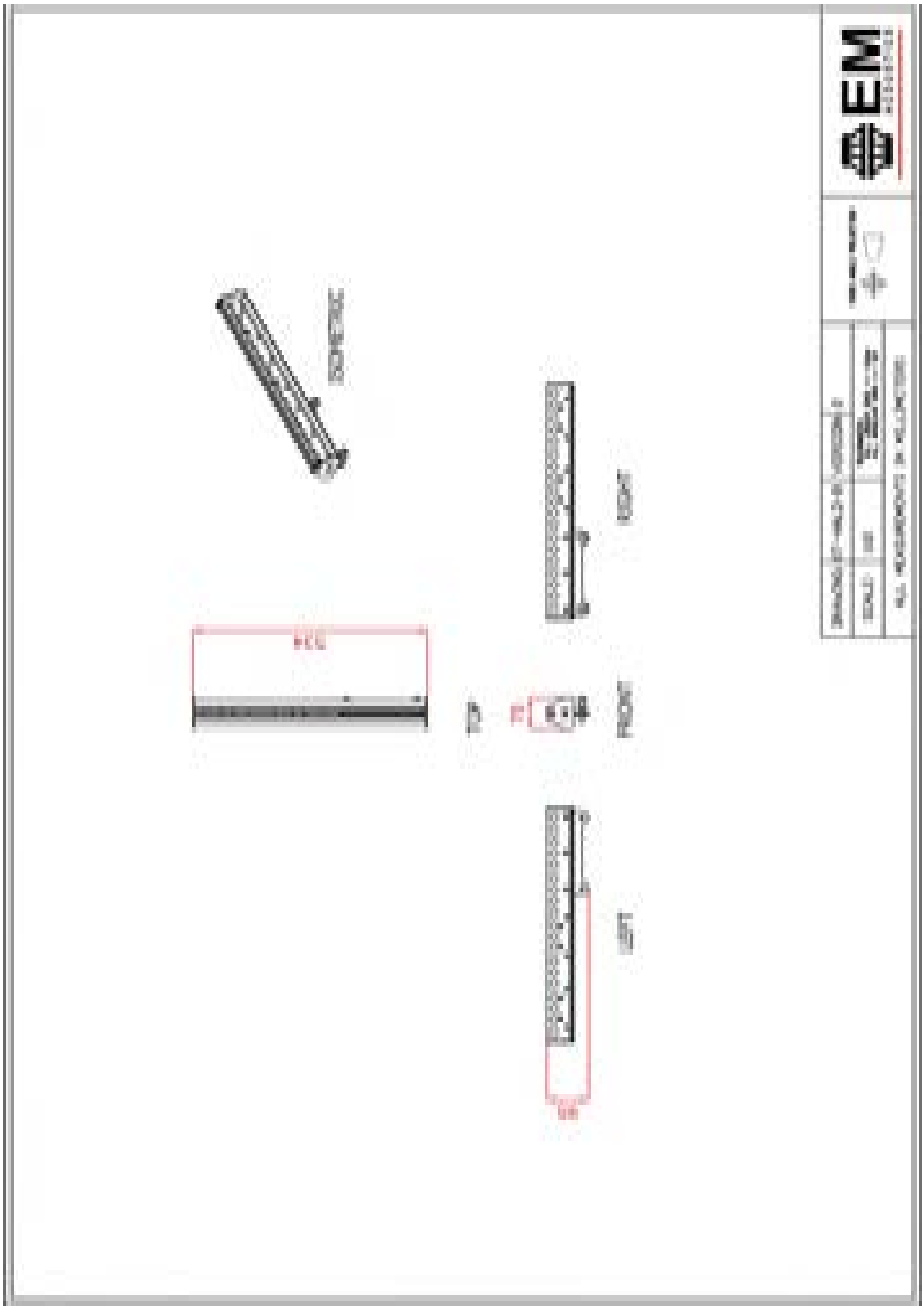
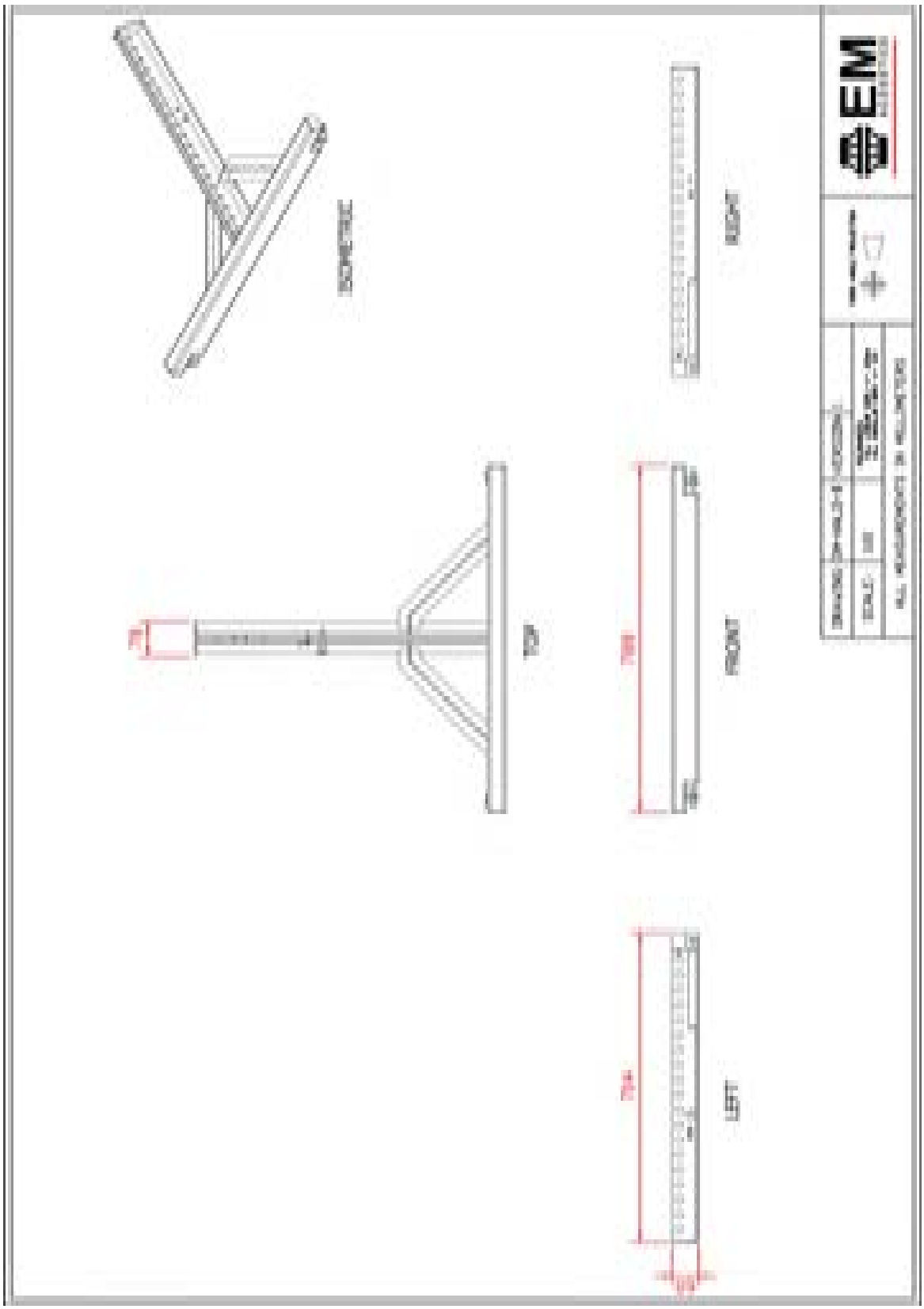
600
90
DRAWING CG-HALO-B VERSION 1
SCALE 1:10
ALL MEASUREMENTS IN MILLIMETERS




ISOMETRIC
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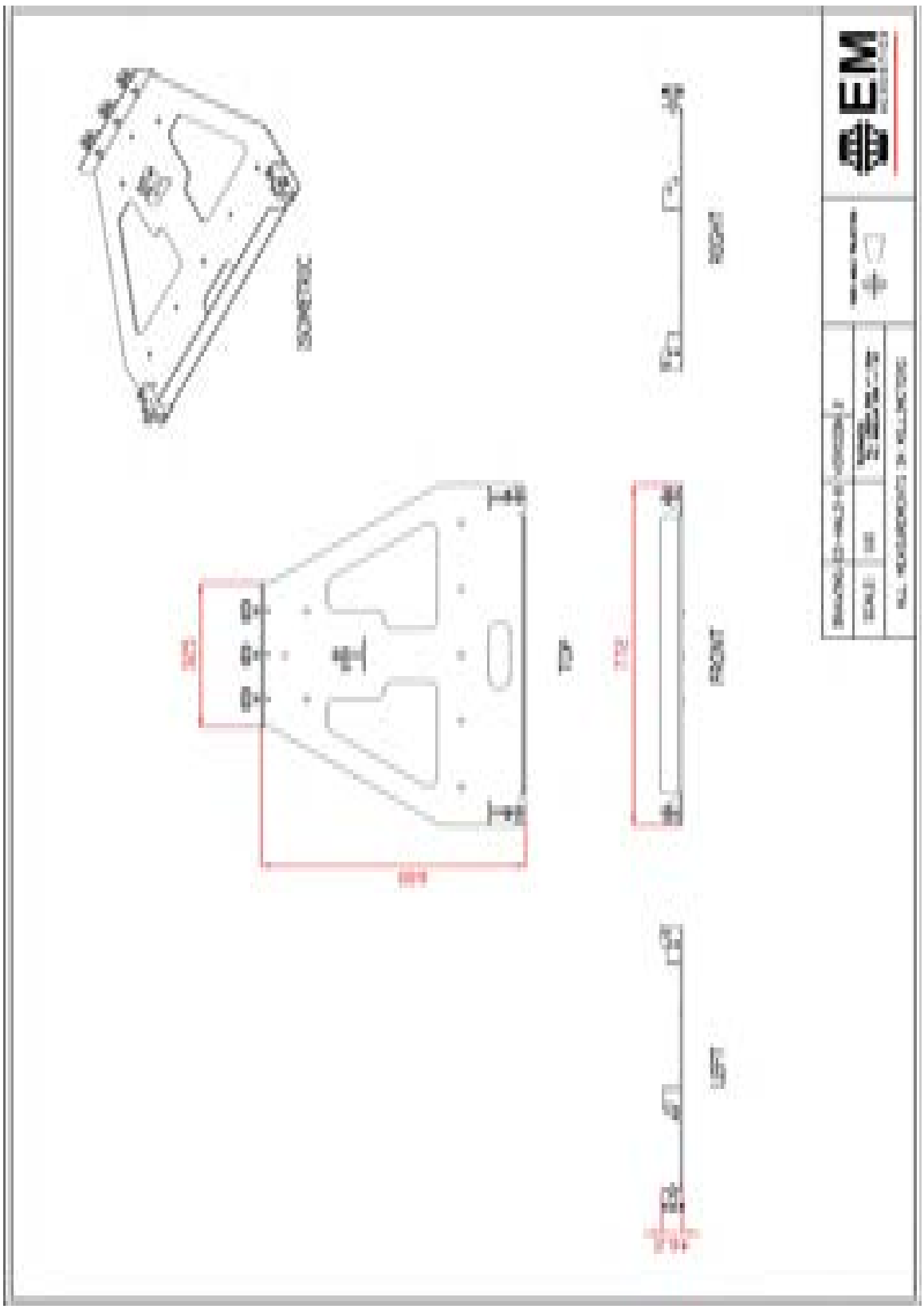

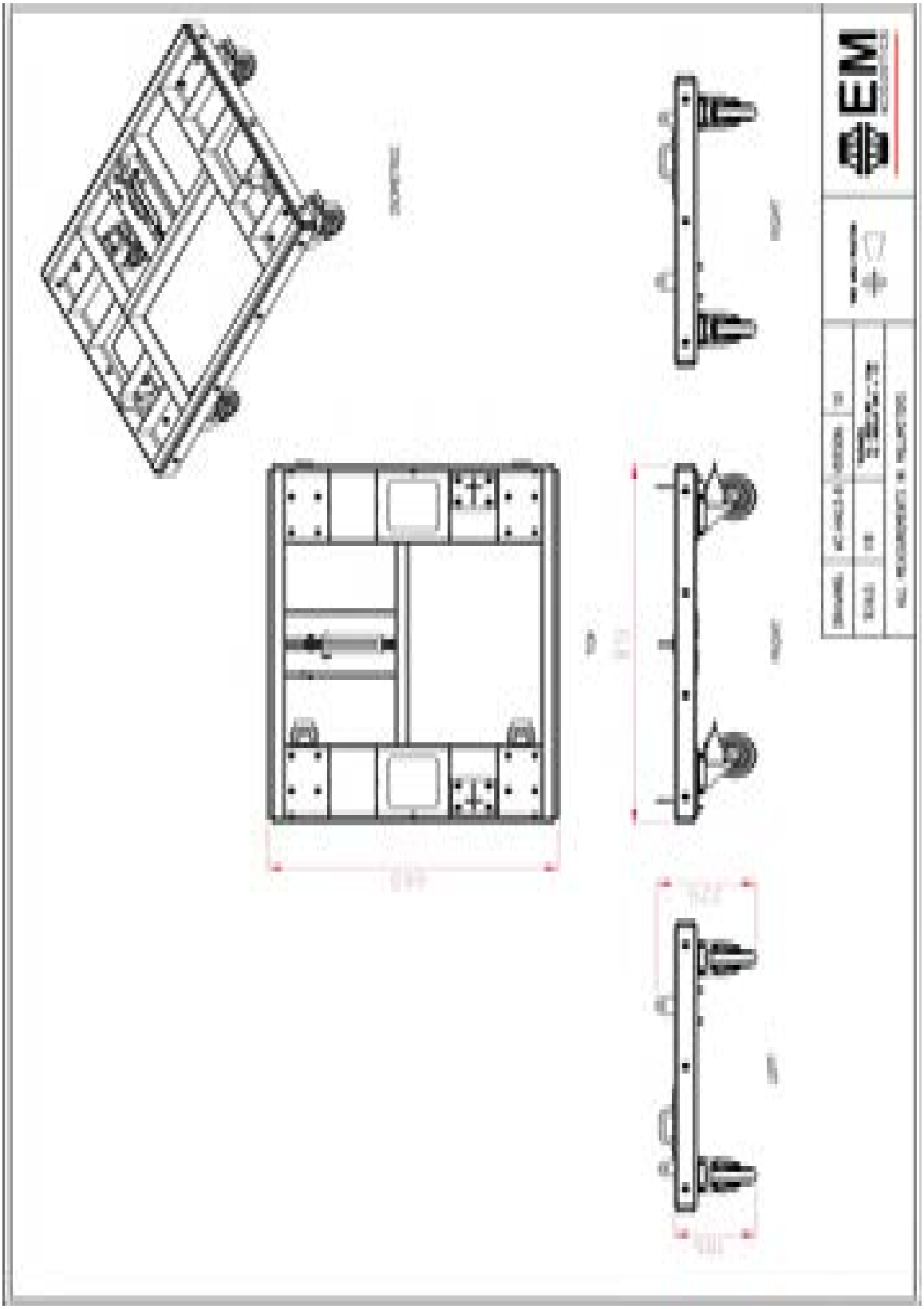

Appendix C - Spare Parts List

Order Code	Description
01A030	DU-807 replacement 16 ohm 8" LF drive unit
01B017	CDU-1005 replacement 16 ohm 1" exit HF drive unit
04A048	RFG-HALO-B replacement grille/fabric for HALO-B
05A097	PIN-0.3125/0.625 ball-lock flying pin - HALO-B front rigging
05A087	PIN-0.375/0.813 ball-lock flying pin - HALO-B splay rigging

Appendix D – Warranty Information

Limited Warranty

This EM Acoustics loudspeaker product is warranted to the original end-user purchaser and all subsequent owners for a period of **five (5) years** from the original date of purchase.

Warranty Coverage

This warranty covers defects in materials and workmanship. It does not include:

- Damage or failure caused by accident, misuse, neglect, abuse or modification by any person other than an authorised EM Acoustics representative.
- Damage or failure caused by operating the loudspeaker product contrary to the instructions contained within this manual.
- Damage caused during shipment.
- Claims based on any misrepresentation by the seller.
- Products which contain anything other than the original components (or EM Acoustics factory supplied spare parts).
- Products on which the serial number has been removed, altered or defaced.

Returning your EM Acoustics loudspeaker

Should your EM Acoustics loudspeaker develop a fault, please return it (freight prepaid) in its original packaging, along with proof of purchase to your local dealer or to:

EM Acoustics (Returns Department), Building 19.11, Dunsfold Park, Cranleigh, Surrey, GU6 8TB, UK

including a description of the suspected fault. Serial numbers must be quoted in all correspondence relating to the claim. EM Acoustics or its representatives are in no way liable for any loss or damage in transit, and hence it is recommended that the sender insure the shipment. EM Acoustics will pay for return freight should the repair be covered under warranty.

EM Acoustics' liability is to the replacement or repair (at our discretion) of any defective components, and as such are not liable for any incidental and consequential damages including (without limitation) injury to persons, damage to property or loss of use.

This warranty is exclusive and no other warranty is expressed or implied. This warranty is also in addition to – and in no way detracts from – your statutory rights as a consumer.