S-215 Subwoofer

Product User Manual
v1 February 2021

EM ACOUSTICS

LOUDSPEAKERS REDEFINED

Contents

DECLARATION OF CONFORMITY

The products contained within this manual conform to the requirements of the EMC Directive 89/336/EEC, amended by 92/31/EEC and to the requirements of the Low Voltage Directive 73/23/EEC amended by 93/68/EEC.

EMC Emission	EN55103-1:1996
Immunity	EN55103-2:1996
Electrical Safety	EN60065:1993

RECYCLING

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. These products also all comply to the RoHS Directive 2002/95/EC.

1.0 - Introduction

Thank you for purchasing the S-215 subwoofer from EM Acoustics. This product 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 new product, please do not hesitate to contact us directly or your local EM Acoustics representative.

The S-218 is a high-power reflex subwoofer, intended for a wide variety of low frequency applications in medium to large applications. The S-218 is equally at home in permanent installations as well mobile applications due to its rugged construction. A pair of state-of-the-art 18" high-excursion neodymium drive units allows a surprising amount of SPL and low frequency extension from a compact and lightweight cabinet.

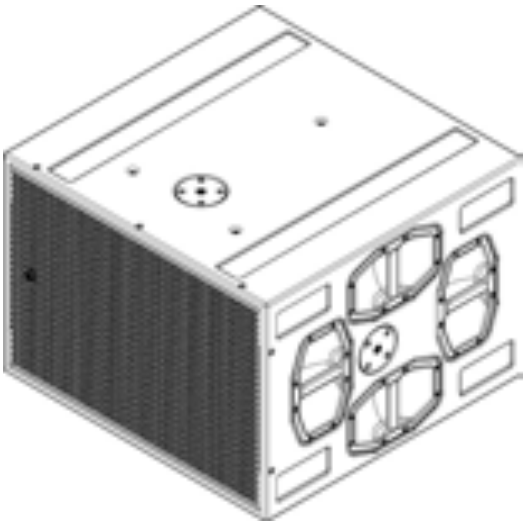
This manual contains all the information you should need on topics of set up, amplifier connection and basic service. If you feel we have missed anything, or you have a question not covered by this manual, please visit our website www.emacoustics.co.uk and send us a message or give us a call – we're 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 – S-215 Subwoofer

Compact high-power reflex subwoofer



FEATURES & BENEFITS

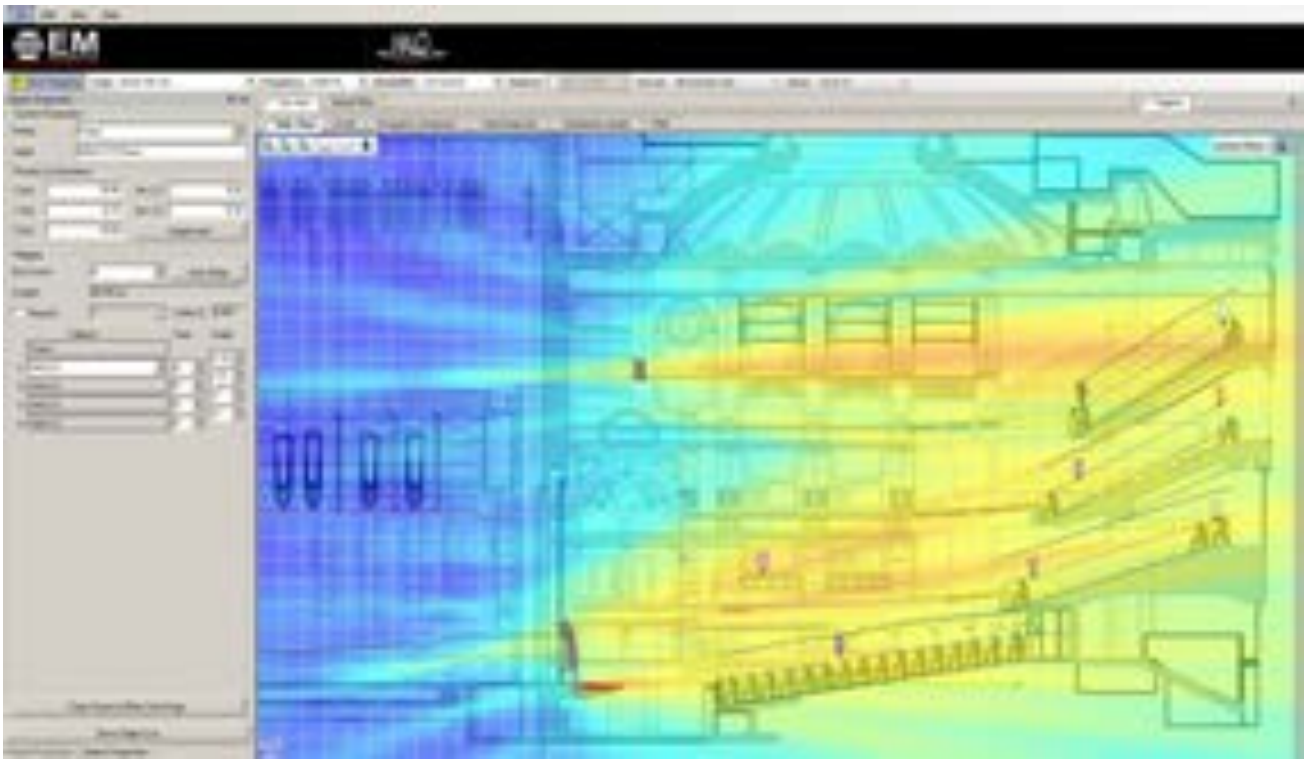
- Signature EM Acoustics "maximum headroom" design approach ensures consistency of performance regardless of SPL level.
- Enclosure coated with 3-step polyurethane process - ensuring the cabinets are not only weather resistant but more resilient to impact damage.
- Various features and accessories for easy moving & handling.
- Tour grade castor set included.
- Single amplifier channel required.

KEY SPECIFICATIONS

ENCLOSURE TYPE:	Compact high-power reflex subwoofer
DRIVE UNITS:	2 x 15" neodymium LF drive units
FREQUENCY RESPONSE:	40Hz - 150Hz +/-3dB
NOMINAL DISPERSION1:	omnidirectional
MAXIMUM SPL:	133dB continuous, 139dB peak
NOMINAL IMPEDANCE:	4 ohms
DIMENSIONS (HxWxD):	550 (21.7) x 772 (30.4) x 752 (29.6) mm/(ins)
NET/SHIPPING WEIGHT:	62/66kg (136/141lbs)

3.0 – Simulation

Ease Focus 3



For acoustic reasons it is advised that users familiarize themselves with Ease Focus 3 – this system provides the user with accurate simulations for setting up S-215 subwoofers.

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 S-215 subwoofers including the specific use of Ease Focus 3, please contact your local distributor.

4.0 - Safety Considerations

General Considerations in use

Loudspeaker systems are potentially dangerous objects if used incorrectly. Please ensure that you read this section fully, and contact EM Acoustics or your local dealer should you be in any doubt over correct operation procedures.

Personal Injury

Never stand in the immediate vicinity of loudspeakers when in use at high level. Professional loudspeaker systems are capable of producing sound pressure levels which can cause permanent damage to human hearing. Levels in excess of 90dB can cause hearing damage if people are exposed to them over a long period of time, so care and attention must be used for both staff and audience members.

When deploying loudspeaker systems on the ground or when flown, please take careful note of the following important safety considerations:

- Only use accessories and flying hardware supplied or approved by EM Acoustics for flying or transporting loudspeaker systems. Pay close attention to specific instructions, especially those considering maximum load capabilities as detailed in the appropriate user manuals or on the legend labels on the accessories themselves.
- Ensure all additional accessories, fasteners and secondary safeties are of an appropriate size, working load limit and safety factor.
- All loudspeakers and accessories should be regularly inspected for signs of wear and tear, and any damaged parts should be replaced.
- All load bearing parts and assembly bolts on accessories should be regularly checked to ensure they are tight and not worn.

Ground Stacking

- Ensure that the floor or stage surface can withstand the weight of the system.
- Wherever possible, avoid high stacks and use ratchet straps to secure loudspeakers together. Please also remember that vibrations from subwoofer systems can shake other loudspeakers out of place, which may present a toppling hazard. The use of ratchet straps and non-slip material is recommended to prevent this.

Rigging and Suspension

Please see Chapter 5 for further information on the detailed rigging options for your loudspeaker system.

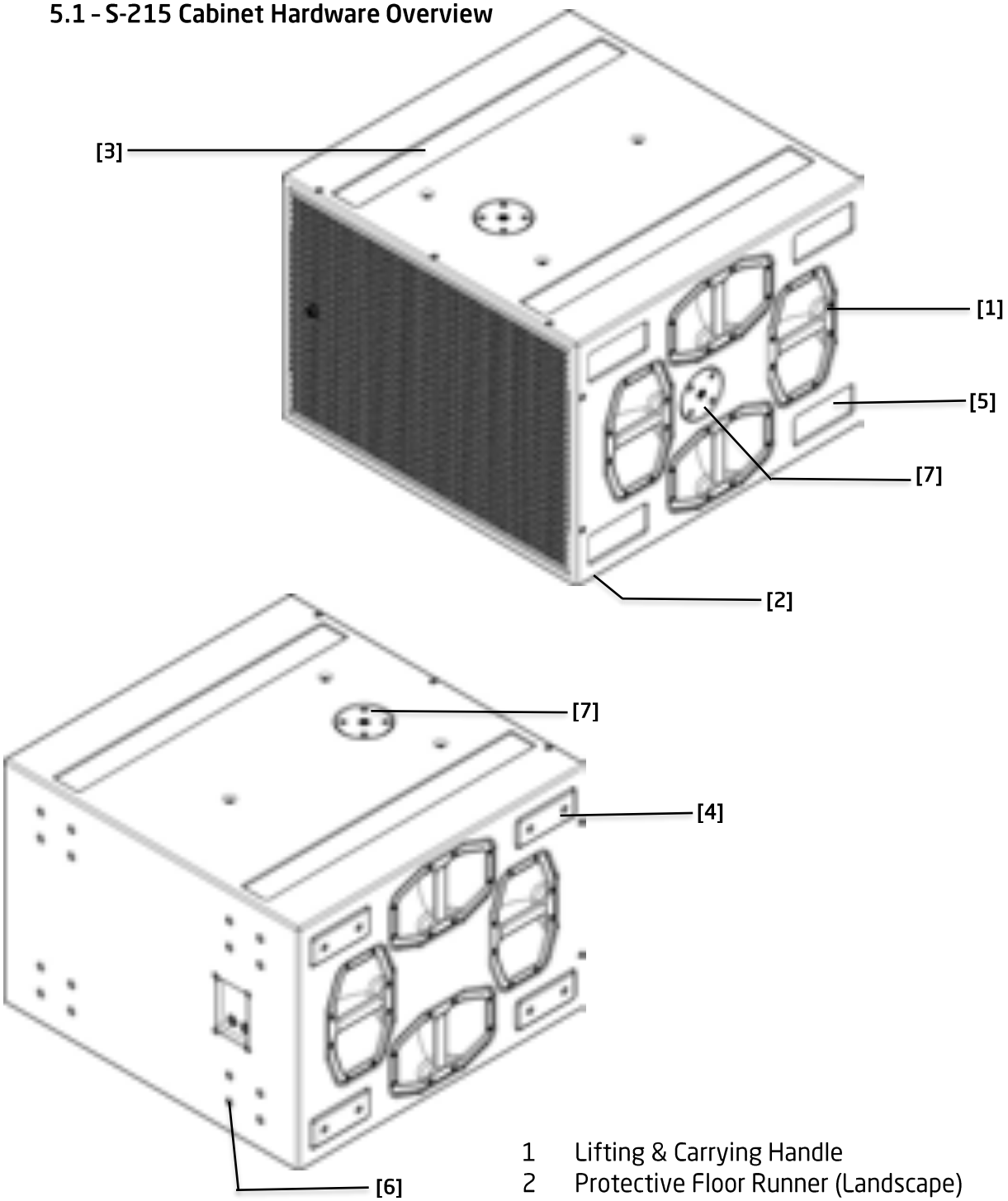
WARNING: The overhead suspension of loudspeakers is a very serious issue with potentially lethal consequences should anything go wrong. Rigging should only be carried out by experienced personnel following safe working practice. Should you be in any doubt whatsoever, please contact your local dealer who will be able to refer you to a suitable rigging company.

Material Damage from Magnetism

Loudspeakers produce a static magnetic field at all times - even when not in use. Certain devices are susceptible to external magnetism, and as such a safe distance should be maintained to prevent damage. It is recommended that a safe distance of 0.5m (1.5ft) is maintained from loudspeakers when stored, transported and in use, from devices such as computer hard drives, magnetic media, bank cards to remove the risk of corruption. Larger distances may be required for some older cathode ray tube displays.

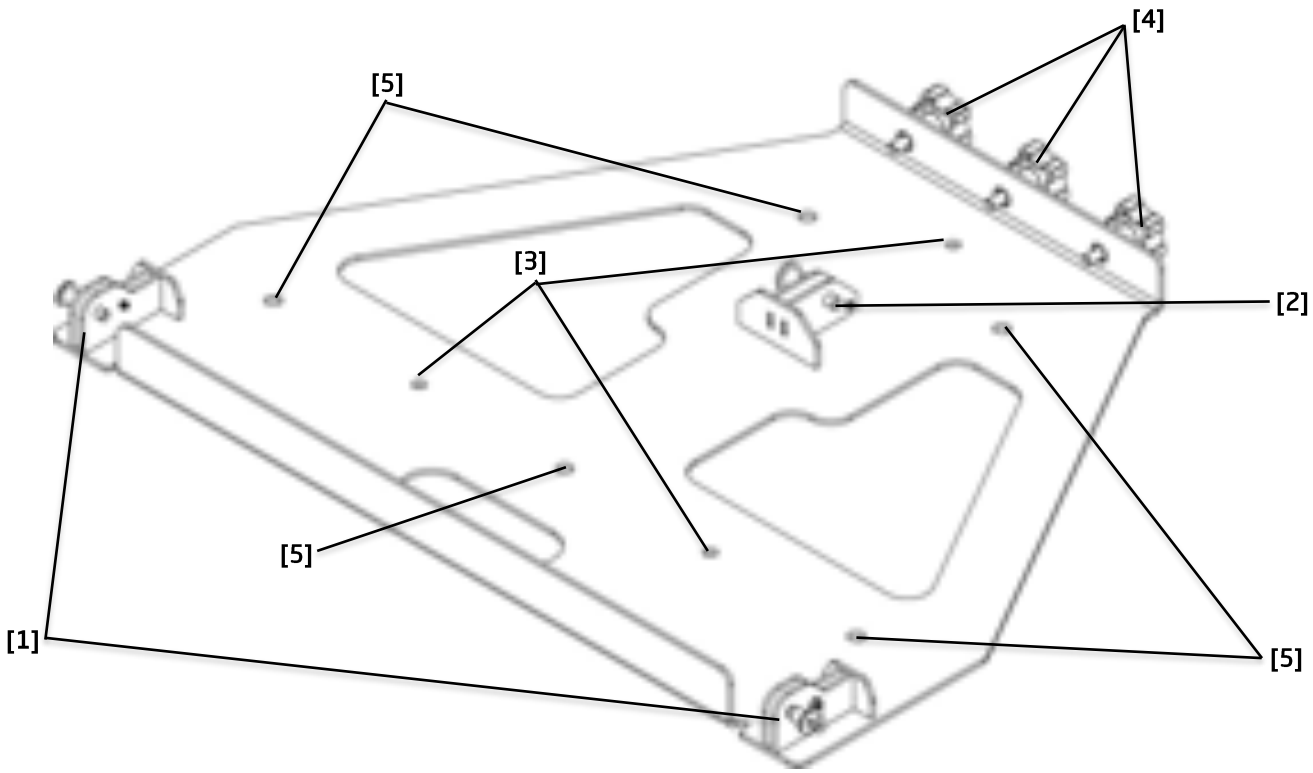
5.0 - Loudspeaker Hardware

5.1 - S-215 Cabinet Hardware Overview



1 Lifting & Carrying Handle
2 Protective Floor Runner (Landscape)
3 Stacking recess (Landscape)
4 Protective Floor Runner (Portrait)
5 Stacking recess (Portrait)
6 Castor attachment point
7 M20 threaded polemount

5.2 - 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 knobs.

[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.

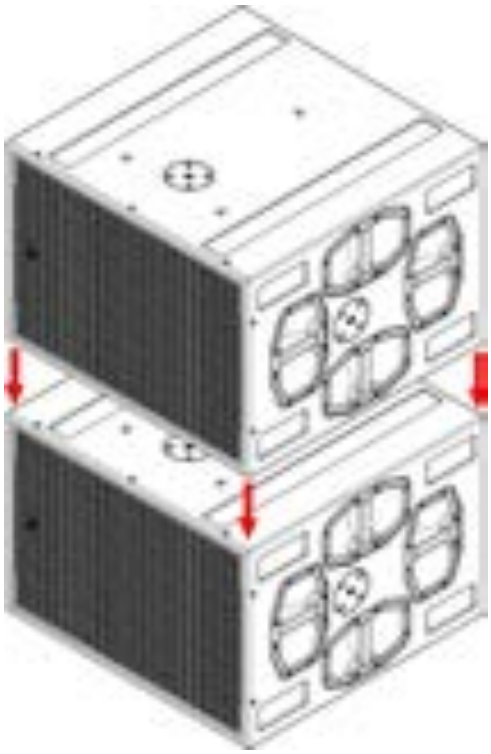
[5] - Installation Points

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

6.0 - Rigging Options

6.1 – Stacking S-215 subwoofers

The S-215 subwoofer has two protective plastic runners on the underneath, and matching recesses in the top face of the cabinet. When stacking S-215 subwoofers, this provides a neat and clear way of creating a tidy stack.



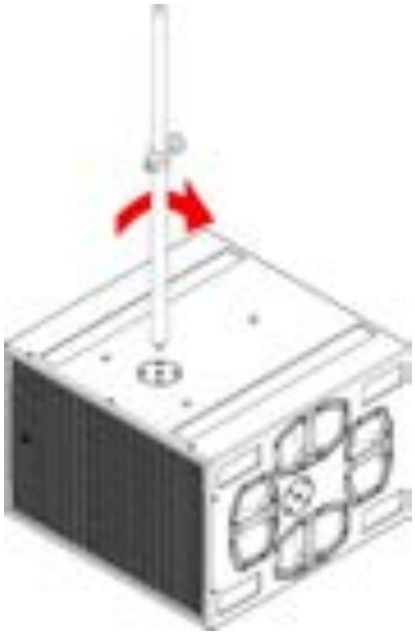
PLEASE BE AWARE THAT STACKS SHOULD ALWAYS BE PLACED ON LEVEL GROUND, AND STRAPS OR SIMILAR SHOULD BE USED TO SECURE THEM.

There are also runners on one end to facilitate using the subwoofer end-up. S-215 subwoofers should **not** be stacked on top of each other in this way. The small recesses in the opposite end are to ensure you can position stacks of landscape S-215 directly beside each other.

6.2 – Using the M20 threaded pole adapter

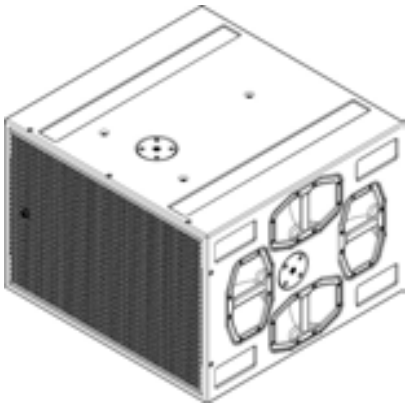
The S-215 has two M20 threaded adaptors - one in the top face and one in the right hand side. These are designed to receive M20 threaded pole fittings such as the EM Acoustics DP-01 or DP-02. To fit such a device, carefully start the threaded end in the fitting, and continue to turn clockwise until the flange of the pole is secure against the threaded adapter.

Ensure that the pole is screwed fully into the adapter before mounting any loudspeaker on to the pole.



6.3 - Ground Stacking with HALO-B & GS-HALO-B

Step 1.

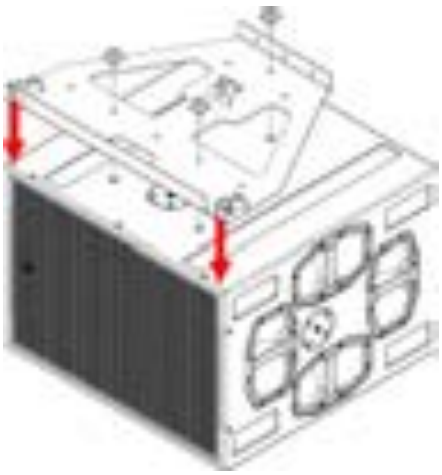


Prepare the S-215 subwoofer by sitting it on its floor runners. If more than one subwoofer is being used, secure them together with ratchet straps or similar.

Step 2.

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

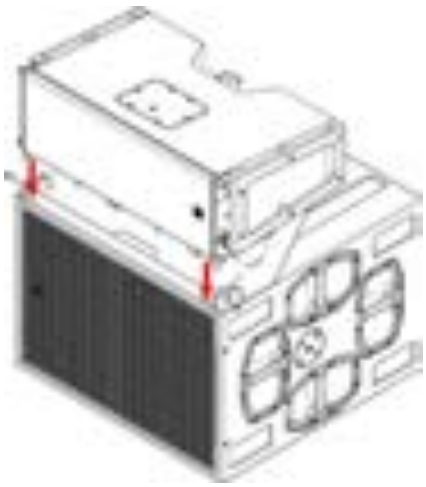


Step 3.

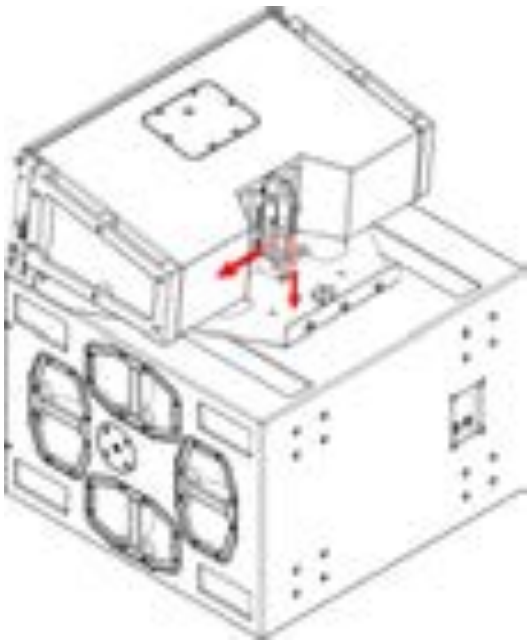
Remove the front Enclosure Link pins, and the central rear Splay Link pin.

Step 4.

Prepare the first HALO-B enclosure as described in the HALO-B manual - 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.

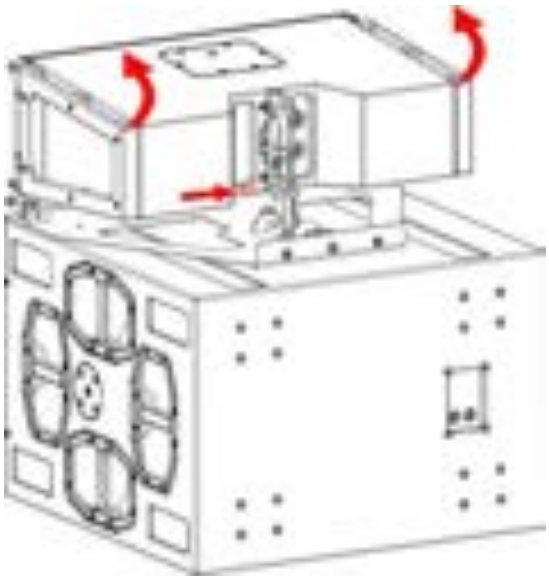


Remove the Angle Set pin from the rear rigging assembly - the Splay Link will drop down under gravity. Ensure it engages in the central clevis, where there is a stop to prevent it travelling too far.

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.

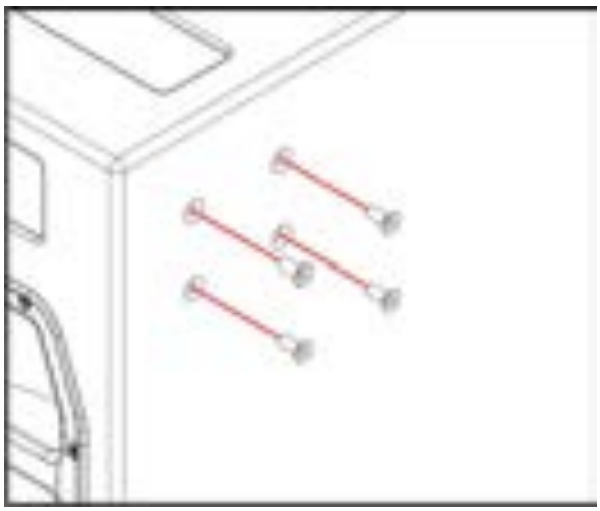
FOR ANY GROUND STACK SYSTEM, ENSURE THE STACK IS ON LEVEL, STABLE GROUND AND CANNOT TOPPLE OVER. IF IN DOUBT, SECURE THE STACK USING RATCHET STRAPS OR SIMILAR TO ENSURE THERE IS NO RISK TO ANY PERSON NEAR THE ARRAY.

6.4 - Fitting castors

The S-215 is supplied with a set of four tour-grade castors which can be fitted for ease of movement. The carton should contain:

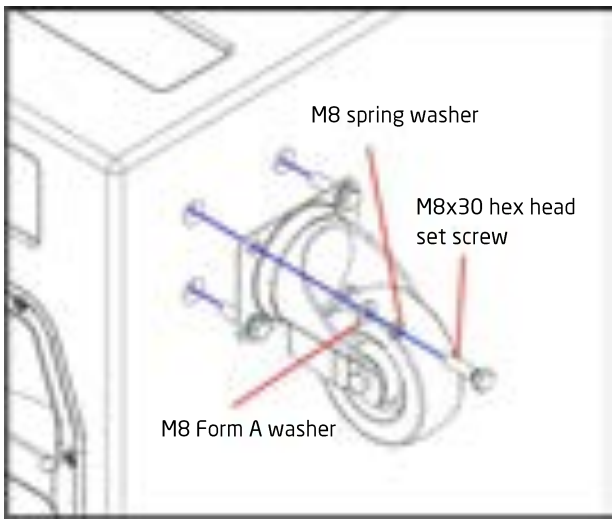
4pcs 32 x 100mm heavy duty castor
17pcs M8 x 30 hex head set screw
17pcs M8 Form A (flat) washer
17pcs M8 spring washer

Step 1.



Using a 5mm Allen key, remove the 16 M8 x 20 countersunk socket machine screws on the rear panel. Ensure that all the threaded fittings inside the cabinet are still intact and the threads are clear before proceeding.

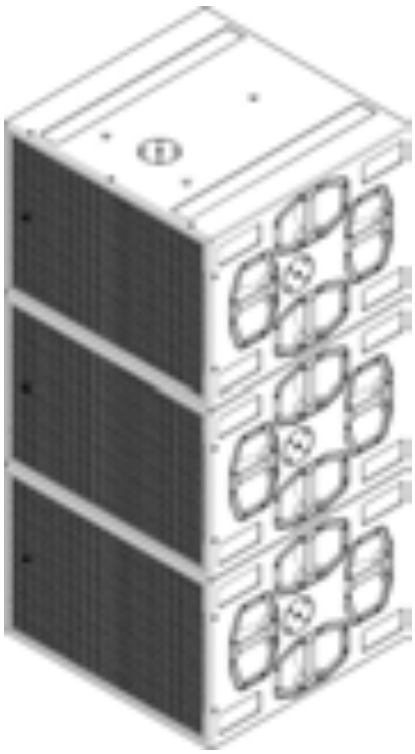
Step 2.



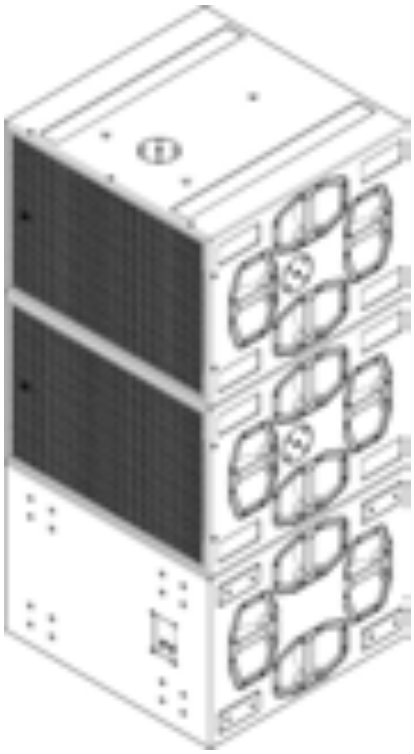
Fit each castor to the rear of the cabinet, ensuring all four bolts are started in their threads before tightening completely. The Form A (flat) washer should be in contact with the castor frame, and the spring washer should be between the flat washer and the bolt head.

6.5 – Cardioid Use

The S-215 feet and recess locations are symmetrical front-to-back, so subwoofers can be reversed to create cardioid arrays. Simply assemble the subwoofer stack or flown column as normal but reverse every third subwoofer. The stack of subwoofers should be secured with ratchet straps or similar for safety.



Standard subwoofer column
All subwoofers forward



Cardioid subwoofer column
One subwoofer in three reversed

For guidance on correct cabling for cardioid subwoofer arrays, see Section 7.4.2 of this manual.

7.0 – Powering the System

The S-215 subwoofer can be powered from any amplifier & DSP combinations with the relevant high & low pass filter, and limiter settings. However, due to the self-contained nature of the package, the use of DQ Series advanced system amplifiers is highly recommended. The use of DQ 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

The S-215 requires only a single amplifier channel. Inputs to the S-215 enclosure are on Neutrik SpeakON NL4 as illustrated below.

Two-core cable should be used for connecting S-215 subwoofers, and the connections are as follows:

SpeakON connection	1+	1-	2+	2-
Drive unit connection	LF +	LF -	Link Through	Link Through

7.1.2 - Connector Options

The S-215 is supplied as standard with two NL4MP connectors. For more demanding environments, S-215s can be supplied with other options by special order – please contact EM Acoustics to discuss your requirement.

7.1.3 – Amplifier Requirements

The S-215 is a very powerful subwoofer, making use of some of the most advanced drive units available in the industry today. It is good practice to ensure that your amplifier can deliver at least double the RMS power handling of the loudspeaker to ensure full headroom, and as such the amplifier requirement is:

Product	RMS Power Handling	Recommended Min. Amplifier Power
S-215/ST-215	2000W @ 4 ohms	4000W @ 4 ohms

All of the DQ Series advanced system amplifiers can be used to power the S-215, however the DQ6 and DQ10 are lower power models and as such will not provide maximum power for the subwoofer.

The following table shows the maximum number of S-215 that can be connected per channel on the various different amplifiers:

Amplifier	Max S-215 per channel
DQ6	1*
DQ10	1*
DQ20	1

* - The DQ6 and DQ10 do not provide sufficient power for maximum headroom for the S-215 and as such should only be used in lower SPL environments.

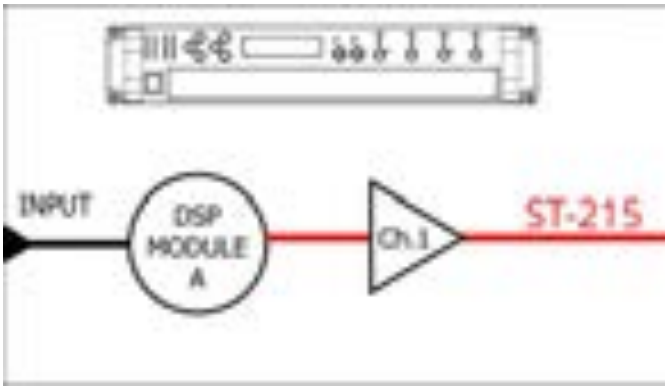
7.1.4 – Processing Requirements

The S-215 requires active high and low pass filters, and appropriate limiter settings. If not using DQ Series amplifiers, or the DSC48 Digital System Controller, then a suitable DSP system must be used in conjunction with your S-215 to prevent damage to the subwoofer. Check the EM Acoustics website for the most up-to-date DSP settings for the S-215.

7.2 - Presets and Settings

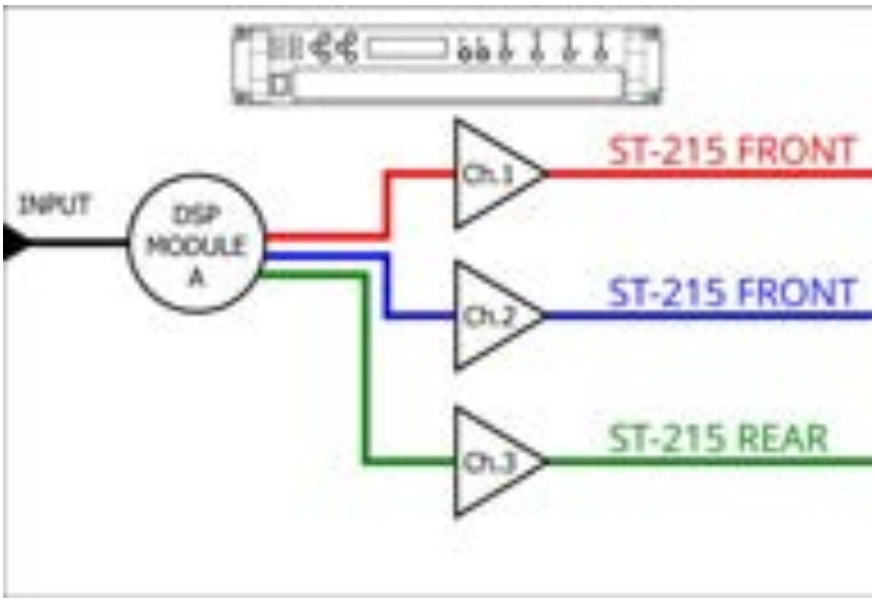
7.2.1 – Standard ST-215 Preset

S-215/ST-215 subwoofers require only a single amplifier channel, and as such the preset recalled will only require one output from your DQ Series amplifier.



7.2.2 – Cardioid Array Preset

The S-215/ST-215 can be used to create cardioid arrays as detailed in chapter 6 by ensuring that one in three subwoofers are physically reversed, and the appropriate S-215/ST-215 Cardioid preset is loaded into the amplifier. This preset requires three amplifier channels.



7.2.3 - Geometric Delay

Appropriate delay will need to be applied to account for physical location differences between different elements of your system – for example time-aligning subwoofers to the main system. The use of SMAART or similar can make this task a great deal simpler and faster.

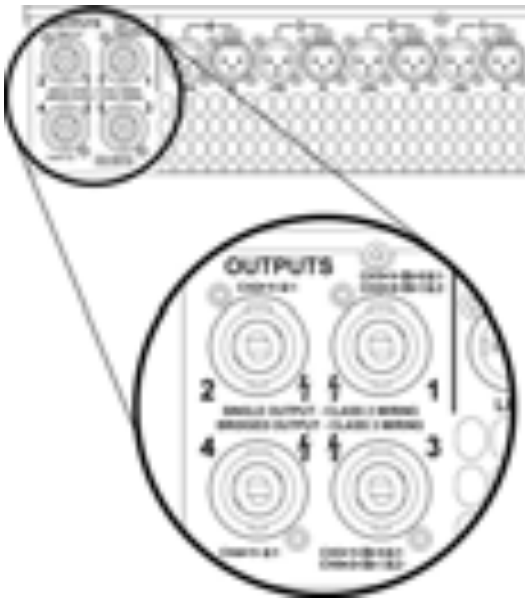
7.2.4 - Applying EQ

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. The S-215 is designed with a significant amount of system headroom, so applying EQ is perfectly acceptable.

7.3 - Use with the DQ Series Advanced System Amplifiers

The S-215 will perform best when using DQ Series advanced system amplifiers, as not only are they state-of-the-art amplifiers, but the onboard DSP provides appropriate high/low pass filter settings and limiters to get the best from your subwoofers. Please refer to the DQ Series 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. S-215 subwoofers require one amplifier channel.

7.3.2 - Preset Recall

The family of S-215 presets is pre-installed on the DQ amplifiers, and as such can be used following the normal preset recall procedure. The S-215 and it's flyable variant the ST-215 utilise the same presets. The presets available are:

ST-215.Sub	Standard S-215/ST-215 subwoofer preset
ST-215.Card	Cardioid Array S-215/ST-215 subwoofer preset

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

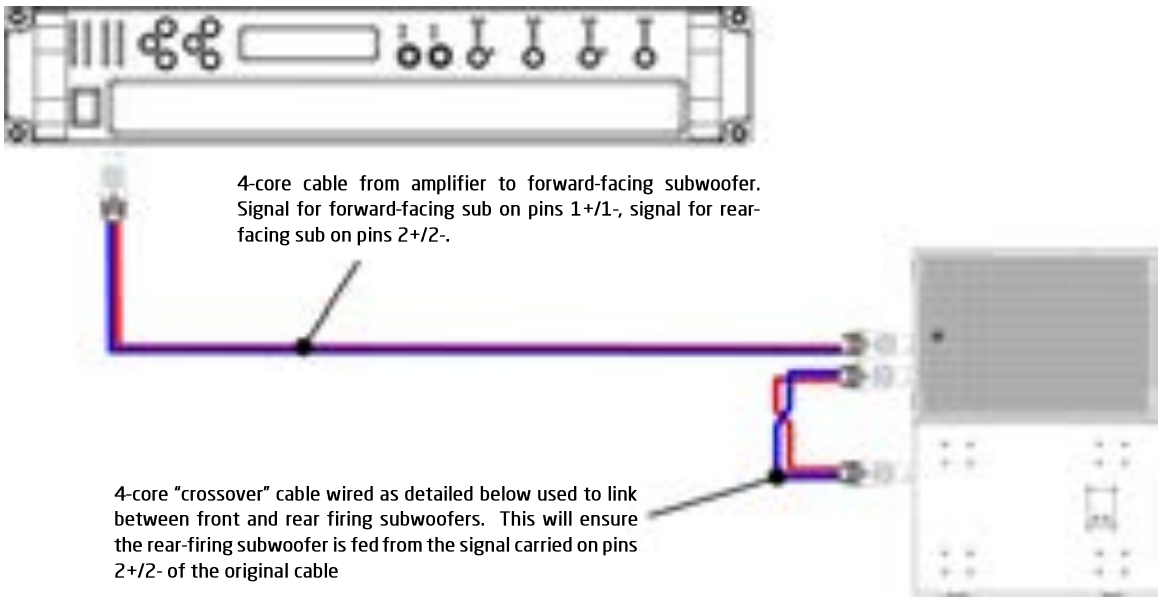
7.4.1 - Cable Length and Specification

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 2.5mm² should not be used. Recommended maximum cable lengths are given below:

Conductor Area	Maximum Recommended Cable Length		
	2 ohms	4 ohms	8 ohms
2.5mm² (14 AWG)	15m	30m	60m
4.0mm² (12 AWG)	20m	40m	80m
6.0mm² (10 AWG)	30m	60m	120m

7.4.2 – Crossover Cable Use

The use of a pin-swap or "crossover" cable can allow for neater cable solutions when sending different amplifier signals to the same location. Because pins 2+/2- are linked through inside all EM Acoustics loudspeakers, using a 4-core cable to one loudspeaker (carrying two different signals) allows a crossover cable to be used to link out of the first loudspeaker into another, thereby feeding it from a separate signal.



Crossover cable specifications

Connector A Pin	Connector B Pin
1+	2+
1-	2-
2+	1+
2-	1-

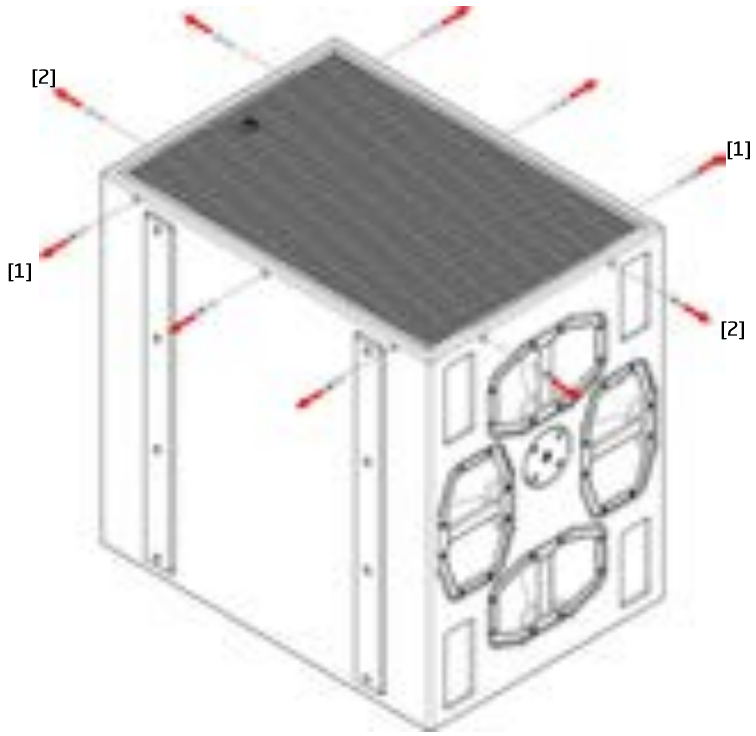
8.0 – Servicing Information

All S-215 components can be removed for service purposes if required, using the minimum of tools.

8.1 – S-215: Removing the grille

TOOLS REQUIRED: 4mm & 5mm Allen key

1. Lie the enclosure on its' back and using a 4mm Allen key, remove the three M6 x 30 countersunk socket bolts [1] from each long edge and the two M6 x 30 countersunk socket bolts [2] from each short edge of the grillle, and then lift the grille clear of the cabinet.

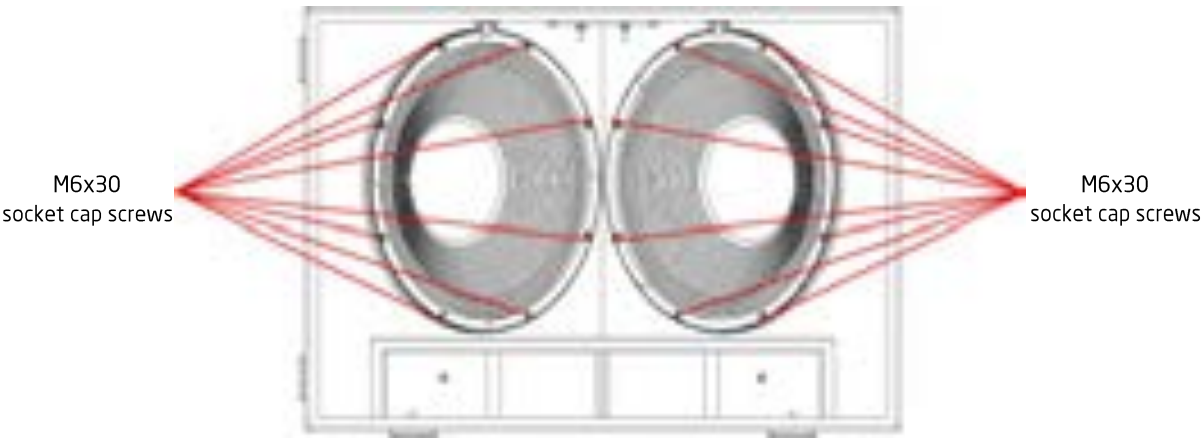


2. To replace the grille, position the grille on the front of the S-215 (logo badge should be on the left of the enclosure) and ensure the threaded fittings on the grille are lined up with the mounting holes. Replace each of the ten M6x30 countersunk bolts and ensure all machine screws are started in 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 – S-215: Removing the drive units

TOOLS REQUIRED: 5mm Allen key

1. Complete step 8.1 above to remove the grille.
2. Using a 5mm Allen key, remove the eight M6x30 socket cap screws that secure the drive units. Ensure that you remove the spring washers from the recesses as well as the machine screws.



3. Lift the drive unit clear of the mounting hole and disconnect the two cables – note the polarity for reconnection (red to positive, black to negative).
4. To replace the drive unit, first sit a fresh gasket around the drive unit hole, ensuring that the holes line up with the cabinet mounting holes. Reconnect the cables to the drive unit (note the red cable goes to the positive (red) terminal, and the black cable goes to the negative (black) terminal on the drive unit) and then sit the drive unit into its mounting location, ensuring that the mounting holes line up.
5. Replace the M6x30 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.
6. Replace the grille as described above.

Appendix A - Technical Specifications

S-215 compact high power reflex subwoofer

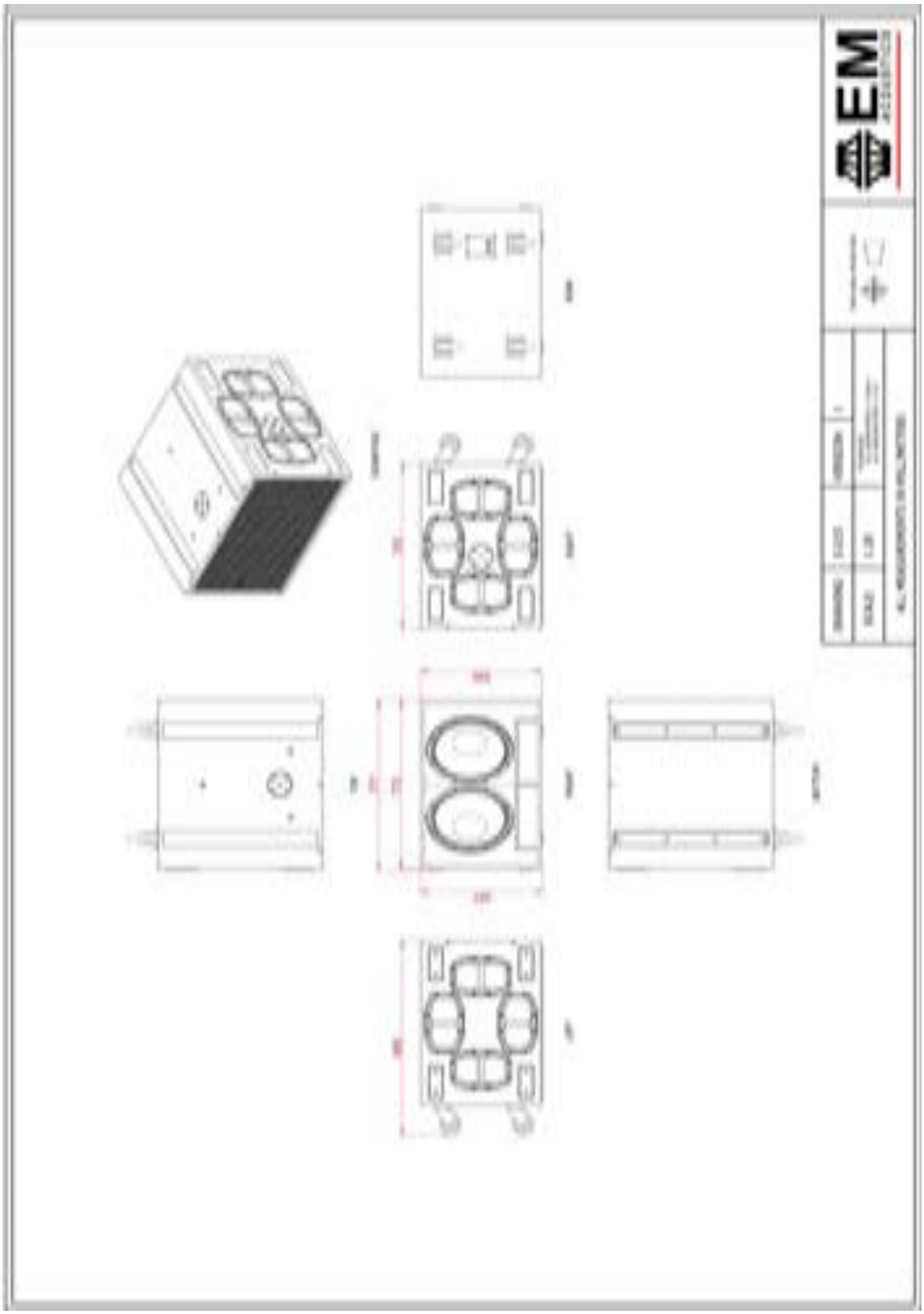
Dimensions (HxWxD) :	550 x 772 x 752mm (21.7" x 30.4" x 29.6")
Net/Shipping Weight:	106kg/108kg (233.2/237.6lbs)
Frequency Response (+/- 3dB)[1]:	40Hz - 150Hz
Dispersion[3]:	Omnidirectional
Drive Units:	2 x 4" (102mm) voice coil 15" (381mm) neodymium LF drive units
Power Handling:	LF: 2000W RMS, 4000W program
Maximum SPL:	133dB continuous, 139dB peak
Nominal Impedance:	4 ohms
Crossover:	External active
Enclosures per amp channel:	DQ6: 1* DQ10: 1* DQ20: 2
Connectors:	2 x Neutrik SpeakON™ NL4MP
Enclosure:	18mm (3/4") multi-laminate birch plywood, rebated, screwed and glued. Finished in polyurethane textured finish
Rigging & Hardware:	8 flush handles, touring runners & stacking recesses. 2 x M20 polemount.Tour-grade castors.
Grille:	Mesh-backed perforated steel
Options:	Colours/extended weather protection
Accessories:	GS-HALO-B ground stacking adapter frame TC-T215 single enclosure padded transit cover

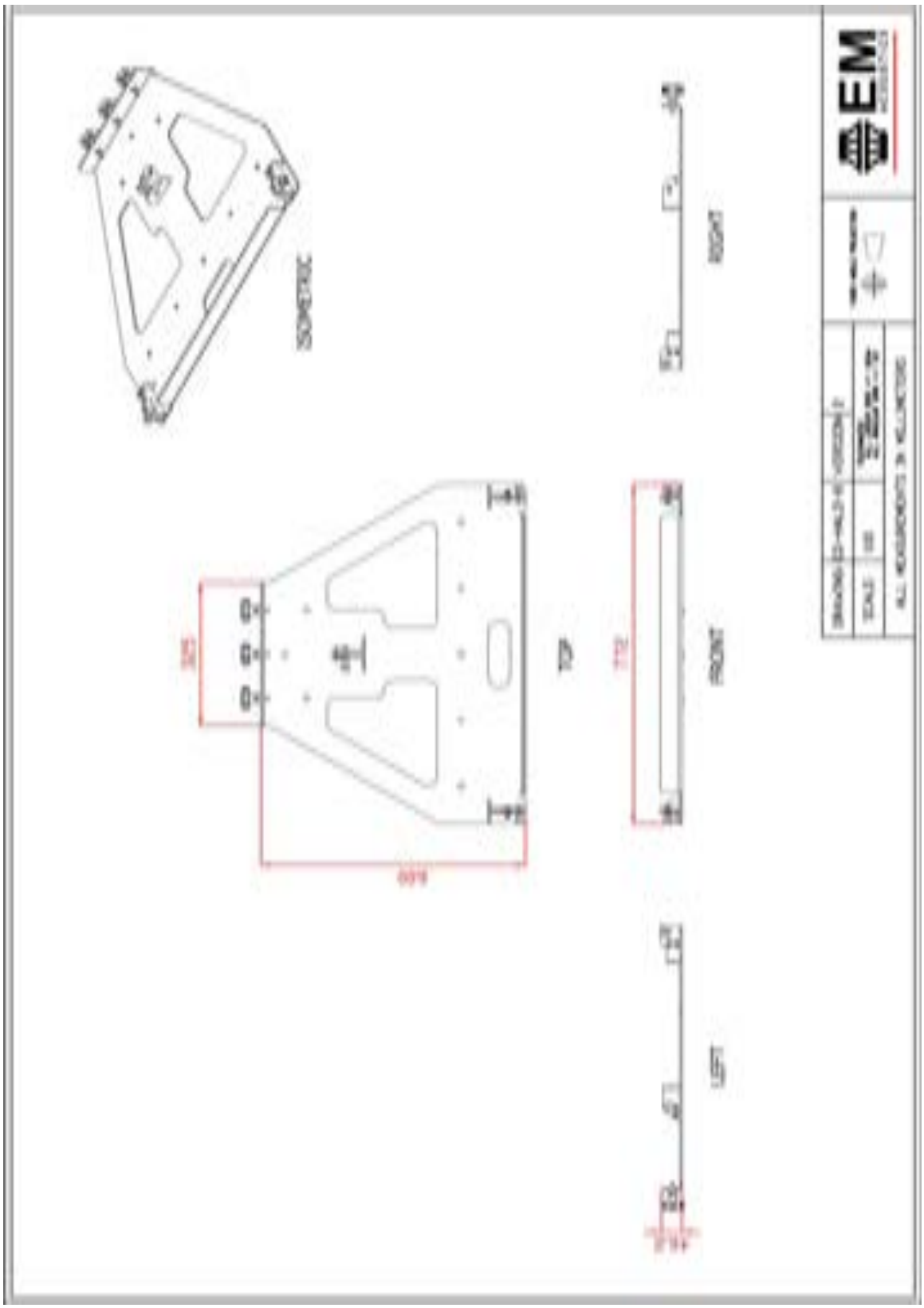
* - The DQ6 and DQ10 do not provide sufficient power for maximum headroom for the ST-215 and as such should only be used in lower SPL environments.

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
RIGHT
FRONT
TOP

Appendix C – Spare Parts List

Order Code	Description
01A031	DU-1508 replacement 8 ohm 15" LF drive unit
04A085	RFG-S215 replacement grille/fabric for S-215

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.