



EMS Series  
User Manual – v2.0



EMS-81/EMS-81i  
EMS-121/EMS-121w/EMS-121i/EMS-121h  
EMS-152/152w  
EMS-215/EMS-215i

**EM Acoustics Loudspeakers**

Building 74, Dunsfold Park  
Cranleigh, Surrey  
GU6 8TB, UK  
Phone +44 (0) 1483 266520  
Fax +44 (0) 1483 275619  
[www.emacoustics.co.uk](http://www.emacoustics.co.uk)

---

Copyright EM Acoustics 2006

1

**EMS Series User Manual**  
[www.emacoustics.co.uk](http://www.emacoustics.co.uk)



## CONTENTS

### Introduction

Thank you .....	3
Unpacking .....	3
Declaration of Conformity .....	3

### Product Range Overview

EMS-81 passive two-way fullrange enclosure .....	4
EMS-121 passive two-way fullrange enclosure .....	5
EMS-152 passive two-way fullrange enclosure .....	6
EMS-215 subwoofer .....	7

### System Set-up

Safety Considerations.....	8
Cabling & Amplifier selection .....	9

### Mounting & Rigging Options

Rigging Hardware & Accessories .....	10
Permanent Installations .....	10
Vertical Flying Cradle Use .....	11
Horizontal Flying Cradle Use .....	12
Dual Enclosure Flybar Use .....	13
EMS-152 Rigging Options .....	14
Ommimount/Powerdrive Bracket Use .....	15

DA-1 Amplifier Installation .....	16
-----------------------------------	----

### Maintenance

EMS-81 Drive Unit Service .....	17
EMS-121 Drive Unit Service .....	18
EMS-152 Drive Unit Service .....	19
EMS-215 Drive Unit Service .....	20

Warranty .....	21
----------------	----

Appendix A – Technical Specifications .....	22
---	----

## INTRODUCTION

### Thank you

Thank you for purchasing a product from the acclaimed EMS Series from EM Acoustics. The EMS Series products have been carefully designed and rigorously tested to ensure years of flawless operation and unprecedented sonic quality. Flexibility is the key factor with EMS products, and consequently they are at home within a wide variety of applications from live and portable applications, through to cafes, bars, nightclubs, theatres and conference centres.

Please ensure that you read this manual carefully before use, and that you keep it to hand should you need it for further reference. Furthermore, should you have any difficulties please do not hesitate in contacting your EM Acoustics dealer, or email [info@emacoustics.co.uk](mailto:info@emacoustics.co.uk) for further assistance.

### Unpacking

Every EM Acoustics product is built to the highest standard and thoroughly tested before it leaves our factory. After unpacking your loudspeaker, please inspect it carefully for any signs of transit damage. If such damage is found, please notify the carrier at once to instigate a claim. It is suggested that you retain all packaging for future re-shipment.

## 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.

Standards Applied:	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.

## PRODUCT RANGE OVERVIEW

### EMS-81/EMS-81i Loudspeaker



The EMS-81 is a versatile, full-range loudspeaker product designed for a wide variety of compact and discreet sound reinforcement applications. It features a high-power 8" (203mm) vented LF driver and a 1" (25mm) exit HF compression driver on a rotatable 90° x 60° waveguide. These components are matched by an internal UniPhase crossover network for unprecedented sonic quality from a completely passive enclosure.

Through the use of the multi-angle enclosure, polemount socket, M10 and M6 rigging points and rotatable horn, the EMS-81 can be used in a wide variety of applications from floor monitoring to permanent installations.

---

#### **To rotate the HF waveguide:**

1. Remove the front grille as described in the Maintenance section on Page 10 of this manual.
  2. Using a 4mm Allen key, remove the four socket-head bolts retaining the HF waveguide in place.
  3. Lift the waveguide up and rotate to the desired position – the wider exit of the waveguide shows the 90-degree dispersion plane.
  4. Reinstall the socket-head bolts and retighten. Avoid over-tightening as this may crack the waveguide.
  5. Reinstall the grille as described in the Maintenance section on Page 10.
- 

As with all EM Acoustics full-range products, no active controller or programmed EQ is required for correct operation. For demanding applications, a 50Hz high pass filter is recommended to increase drive unit headroom however this is not essential for normal operation.

The EMS-81i is the dedicated installation version of the EMS-81 with no handle or polemount, and with a single NL4MP connector and a four-way barrier strip instead of two NL4MP connectors.

## EMS-121/EMS-121w/EMS-121h/EMS-121i Loudspeaker



The EMS-121 is a versatile, full-range loudspeaker product designed for a wide variety of sound reinforcement applications, where higher SPL and lower frequency response restrict the use of the EMS-81. It features a high-power 12" (305mm) vented LF driver and a 1" (25mm) exit HF compression driver on either a 60°H x 40°V (EMS-121) or 90°H x 40°V (EMS-121w) waveguide. These components are matched by an internal UniPhase crossover network for unprecedented sonic quality from a truly passive enclosure.

The family of different formats for the EMS-121 allows a wide variety of applications to be covered – from stand-mounting for public address or small live use through to horizontal installation in low-ceiling venues. M10 and M8 threaded fixings and an integral polemount socket are provided for ease of installation – both permanent and temporary.

As with all EM Acoustics full-range products, no active controller or programmed EQ is required for correct operation. For demanding applications, a 40Hz high pass filter is recommended to increase drive unit headroom however this is not essential for normal operation.

The EMS-121i is the dedicated installation version of the EMS-121 with no handles or polemount, and with a single NL4MPR connector and a four-way barrier strip instead of two NL4MPR connectors. The EMS-121h is a horizontal mounting, permanent installation version for use in situations where ceiling height is critical.

## EMS-152/EMS-152w Loudspeaker

**DA-1 Ready**



The EMS-152 is a high power, medium-Q performance loudspeaker designed for a variety of applications within the live and installation audio markets, where sonic performance and dispersion accuracy are of paramount importance. The enclosure features a high-power 15" (381mm), 4" voice coil neodymium vented LF driver and a 4" aluminium diaphragm, 2" exit compression driver on either a 60°H x 40°V (EMS-152) or 90°H x 40°V (EMS-152w) waveguide. Added to this is a specific cone profile to allow the dispersion of the 15" drive unit to match that of the high frequency drive unit throughout the crossover region.

These precision components are matched by an internal UniPhase2 passive crossover network. This radical approach to passive crossover technology achieves phenomenal frequency and phase responses without the need for bi-amplification or external processing.

The two formats are intended to provide user-flexibility during system design – the EMS-152 is designed for array construction whereas the EMS-152w can be used where wider coverage is required from a single enclosure – such as centre fills or large format front fills.

Integral to the enclosure are four M10 flying points to allow suspension using a variety of different rigging methods.

As with all other EM Acoustics fullrange products, no external processing or equalisation is required to allow the loudspeaker to function correctly. However, for high SPL applications a high pass filter set above 40Hz is recommended to remove unnecessary LF drive unit cone excursion. The EMS-152 can also accept the new DA-1 digital power amplifier module if required.

## EMS-215/EMS-215i Subwoofer

### **DA-1 Ready**



The EMS-215 is a compact, powerful subwoofer system designed to extend the low frequency performance of EMS-81 and EMS-121 based systems. Through the use of a quasi-bandpass design, the enclosure size is kept to a minimum to allow ease of use in installations where space is a premium.

It features a pair of high power 15" (381mm) LF drive units, each in their own vented chamber. Both drive units then fire through a single exit, located behind the foam grille. For ease of transportation in portable applications, the EMS-215 is fitted with four heavy duty castors and recessed handles. Three polemounts are also fitted to allow the mounting of EMS-81 or EMS-121 enclosures above the subwoofer, in two different orientations.

An active crossover is required to set a low pass filter for correct operation, set at any point below 150Hz. A 24dB/Octave Linkwitz-Riley filter slope is recommended. For demanding applications, a 30Hz high pass filter is recommended to increase drive unit headroom however this is not essential for normal operation.

The EMS-215i is the dedicated installation version of the EMS-215 with no handles, wheels or polemounts, and with a single NL4MPR connector and a four-way barrier strip instead of two NL4MPR connectors. The EMS-215 can also accept the new DA-1 digital power amplifier module if required.

## **SYSTEM SET-UP**

### Safety Considerations

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.

Professional loudspeaker systems are capable of producing damage-inducing sound pressure levels, and hence care should be taken when setting your system up, particularly when it comes to loudspeaker placement within a venue. Damage to the ear can result from levels above 90dB under prolonged exposure.

### Stand Mounting

The EMS-81 and EMS-121 include 35mm polemount sockets for stand mounting. When mounting in this way, please consider the following:

- Ensure your stand height is locked off and the tripod legs are positioned so as to be stable.
- Check the weight loading of your stands before attempting to mount the loudspeaker.
- Do not stack a second loudspeaker on top of the stand-mounted one.
- Ensure cables are run so as to leave enough slack to enable neat wiring, and thus reduce the risk of the speaker being pulled over. Loose cables should be covered or taped down wherever possible to reduce trip hazards.
- If stands are being used outdoors, it may be necessary to add ballast to the base of the stand to prevent it toppling over.
- When using poles on top of subwoofer systems, please observe similar precautions.

### 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

There are a variety of different methods for suspending your EMS-81 and EMS-121 enclosures – please see the detailed section on Page 9 for further information.

**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.**

### Cabling and Amplifier Selection

The EMS Series products are designed to be used with professional power amplifiers providing the following power outputs:

EMS-81	500W/channel <b>into eight ohms</b>
EMS-121	700W/channel <b>into eight ohms</b>
EMS-152	1200W/channel <b>into eight ohms</b>
EMS-215	1600W/channel <b>into four ohms</b>

A small power amplifier working too hard is more likely to damage a loudspeaker than a large power amplifier working within its operating range!

It is good practice to use an amplifier equal to the program power rating of the loudspeaker – so as to retain sufficient headroom and good dynamic range. Care should be taken during operation to avoid amplifier clipping – as this can cause serious damage to your loudspeakers. If in doubt, please contact your dealer who will be happy to assist you in correct amplifier choice and setup.

### Cabling

All EMS Series products are supplied with Neutrik Speakon™ NL4 connectors, wired pin 1+/1-. It is recommended that the resistance of your cable is less than one tenth of the nominal system impedance. Given below are the recommended maximum cable lengths for different cross-sections and impedances.

<b>Conductor Cross Sectional Area</b>	<b>Maximum Recommended Cable Length</b>		
	<i>4 ohms</i>	<i>8 ohms</i>	<i>16 ohms</i>
1.0mm <sup>2</sup>	11m	22m	44m
1.5mm <sup>2</sup>	17m	34m	68m
2.0mm <sup>2</sup>	22m	44m	88m
2.5mm <sup>2</sup>	29m	58m	116m
4.0mm <sup>2</sup>	44m	88m	176m
6.0mm <sup>2</sup>	66m	132m	264m

## **MOUNTING & RIGGING OPTIONS**

### Rigging Hardware & Accessories

The EMS-81 and EMS-121 loudspeakers have a range of integral rigging hardware and optional accessories to enable usage in a wide variety of ways.

The EMS-81 contains ten M10 threaded fixing points around the enclosure, to enable suspension using **forged shoulder eyebolts** (minimum thread length 20mm) or the optional FC-81v vertical or FC-81h horizontal flying cradles. These fixings allow suspension in any orientation, with the rear point being used for pull-back to obtain the desired rigging angle. The EMS-81 also includes four M6 threaded fixings on the rear of the enclosure for use with Omnimount™ Series 30 or Powerdrive™ Series 75 mounting products.

The EMS-121 contains twelve M10 threaded fixings around the enclosure, to enable similar suspension techniques as for the EMS-81. The optional FC-121v vertical and FC-121h horizontal flying cradles can also be used for enclosure suspension. Also included are four M8 threaded fixings on the rear of the enclosure for use with Omnimount™ Series 60 or Powerdrive™ Series 100 mounting products.

For array assembly, the DFB-81 and DFB-121 dual flybars are available from your EM Acoustics representative. These steel plates allow two enclosures to be bolted together, with an angle variable from 0 degrees to 40 degrees splay between the two enclosures.

The EMS-152 has a pair of M10 threaded fixings on the top and bottom of the enclosure for a variety of different suspension methods, primarily aimed at flexible touring solutions. See the section on page 13 for more details.

With any suspension method, a second anchor point should be used as a safety.

**Under no circumstances should the mounting points of one enclosure be used to suspend another enclosure below it. EM Acoustics are in no way responsible for the failure of incorrectly rigged systems. This information relates specifically to the rigging techniques for the EMS-81 and EMS-121 enclosures only. If you are in any doubt about safe practices for rigging loudspeakers, please contact your local EM Acoustics dealer who will be able to advise you.**

### Permanent Installations

Any installation (permanent or temporary) must be securely attached to the structure of the building using chain, steel wire or web straps that are certified and load rated for the loudspeaker system. Consideration must be taken

when determining the loading on the structure to include loudspeakers and rigging hardware, and the appropriate safety factor can then be decided upon. **If you are in any doubt whatsoever**, please contact your EM Acoustics dealer who will be able to refer you to an experienced rigging company. A reputable rigging organisation should also be able to advise on legislation regarding safety factors for suspended systems of this type.

#### Attachment of the FC-81v or FC-121v Vertical Flying Cradles

The EMS-121 enclosure is shown in the drawings, however the technique is the same for both the EMS-81 and EMS-121 enclosures. Lie the enclosure down on its front, and remove the two M10 countersunk bolts on each side of the enclosure (marked "A" in Fig 1). Fit the cradle over the rear of the enclosure as shown in Fig 1 below, and reinstate the M10 bolts into the holes.

The M12 hole at the top of the cradle can be used for either direct fixing in installations, or a hook-clamp or quick-release scaffolding clamp to attach the enclosure to the suspension point. Fit the desired attachment device and stand the enclosure upright, returning the cradle to the vertical orientation (Fig 2). Attach the enclosure to the suspension point, and tighten the clamp. A secondary safety should always be used – this can be done in two ways. Method one involves attaching an M10 forged shoulder eyebolt to the rear pull-back point of the enclosure and then attaching a steel cable or chain between this point and your suspension point. Method two involves wrapping a safety cable around the top part of the cradle (marked "B" in drawings) and around the suspension bar. Once the enclosure is suspended safely, adjust to the desired angle by loosening the plastic knurled knobs on each side (marked "C"), positioning where required and retightening. Additional strength can be gained by tightening the M5 locking bolt on each side (marked "D") using an 8mm spanner. Rotate the enclosure to the desired position and tighten the bolt securing the attachment device.

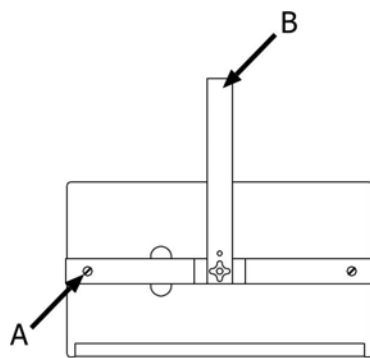


Fig 1

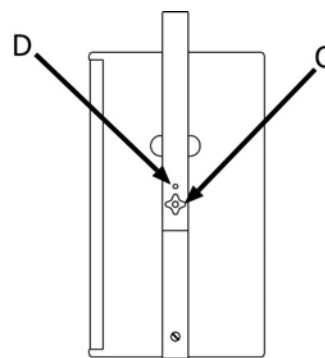


Fig 2

## Attachment of the FC-81h or FC-121h Horizontal Flying Cradles

The EMS-121 enclosure is shown in the drawing, however the technique is the same for both the EMS-81 and EMS-121 enclosures.

Remove the M10 countersunk bolts on the top & bottom of the enclosure (marked "A" in Fig 1), position the end sections of the flying cradle and reinstate the bolts. Bolt the chosen attachment method to the top of the cradle, and secure the enclosure onto the suspension point or bar. As with the vertical cradles, a secondary safety point should be used.

Once the enclosure is suspended, release the plastic knurled knobs (marked "B" in Fig 1) on each side of the cradle and position the enclosure as desired. Once the enclosure is in place, lock off the attachment device to prevent the enclosure rotating, and use the M5 locking bolts (marked "C" in Fig 1) to secure completely.

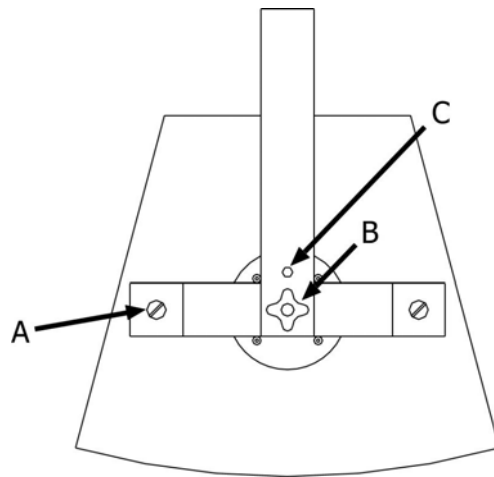


Fig 1

## Attachment of the DFB-81 or DFB-121 flying bar

The EMS-121 enclosure is shown in the drawing, however the technique is the same for both the EMS-81 and EMS-121 enclosures.

Position the two enclosures upright on a stable surface. Remove the M10 countersunk screws on the top of the enclosure (marked "A" in Fig 1) on both enclosures. Position the DFB-121 above the enclosure, and fit M10 forged shoulder eyebolts into the outer pair of mounting holes (marked "B" in Fig 2) and standard M10 hex-head set screws into the inner pair of holes (marked "C" in Fig 2). Do not tighten these bolts until your array position is set to the splay angle you require, indicated by the label on top of the plate. Once you have the desired angle, tighten all bolts.

Carefully turn the cluster upside down, and repeat the above process. There is no need to fit eyebolts on the underside of the enclosure.

Once your cluster is assembled, it can be suspended using steel cables or chains from the eyebolts. To set a down-tilt angle, attach a shackle to the rear M12 hole on the lower DFB-121 (marked "D" in Fig 2), and utilise this point to set the desired down-tilt. Assuming that this point is secured onto a solid structure, this down-tilt angle point can be used as a secondary safety for the cluster. Alternatively, remove one of the countersunk M10 bolts on the rear of the enclosures and fit another M10 eyebolt as a safety point.

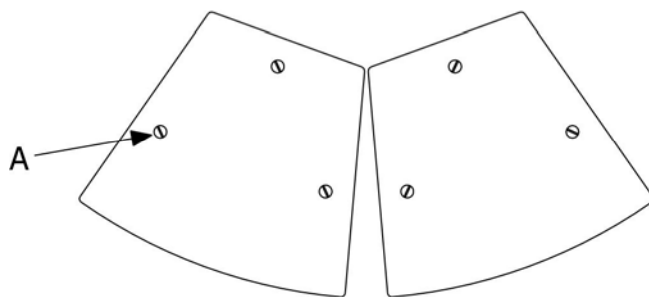


Fig 1

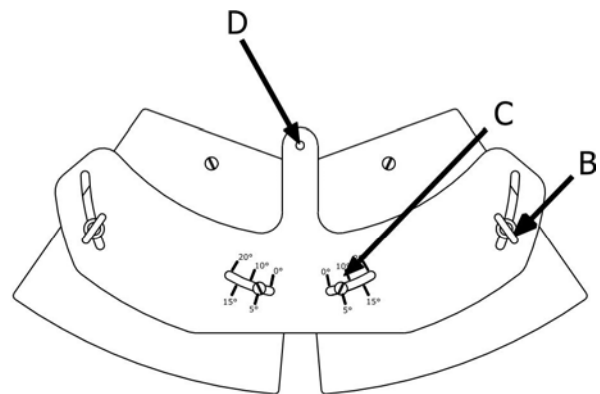


Fig 2

## EMS-152 Rigging Options

There are several different options for suspending an EMS-152 enclosure, detailed below.

### Suspension using forged shoulder eyebolts

The EMS-152 can be simply suspended for more permanent applications using a pair of M10 forged shoulder eyebolts with a 20mm thread length. Simply screw the eyebolts into the two M10 mounting points on the top (or bottom if flying upside down) of the enclosure. These can then be attached to steel cables or chains to suspend the enclosure. For setting down or up-tilt angle, insert an M10 eyebolt into one of the rear M10 points and attach an additional cable or chain – alternatively vary the front or rear chain length on the main points to adjust the suspension angle.

### Attachment of the VFA-152 Variable angle suspension bracket

The VFA-152 is intended to provide an in-place solution for varying the down or up-tilt angle of the enclosure. Using the two M10 socket head bolts (supplied with the VFA-152), bolt the enclosure to the VFA-152 using points marked "A". The quick-lock clamp on top of the VFA-152 (marked "B" in Fig 1) can be used either to attach directly to a suspension point, or else where the desired height of the enclosure is lower than the suspension point (for example in proscenium arch theatre use), suspend a small length of scaffolding bar using traditional wires or chains and then attach the VFA-152 to this. A secondary safety cable or chain should be attached to the eyebolt on the VFA-152 (marked "C" in Fig 1). By adjusting the knob at the rear of the VFA-152 using a 19mm socket (point "D" on Fig 1), the hanging point can be moved. This adjustment moves the suspension fulcrum relative to the enclosure's centre of gravity, and hence will adjust the suspension angle.

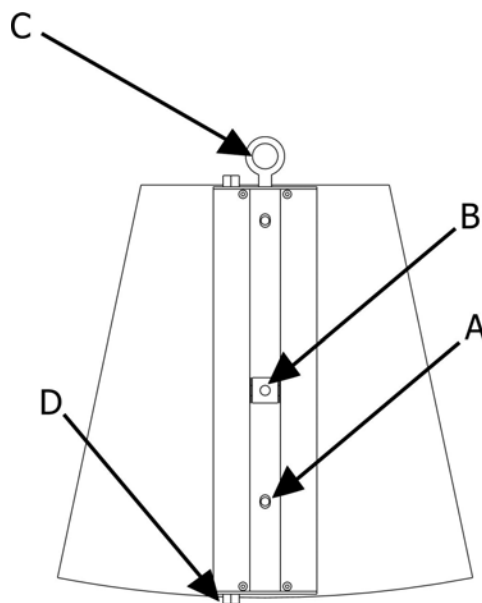


Fig 1

#### Attachment of the DFB-152 flying bar

The attachment method is the same as for the DFB-81 or 121 – the only difference being the attachment points are the exposed M10 threaded fixings front and back on the enclosure's centreline.

#### Attachment of the FC-152v flying cradle

Follow the procedure outlined on Page 11 above, using M10 bolts into the exposed M10 flying points front and back on the enclosure's centreline.

#### Attachment of OmniMount™ or Powerdrive™ Installation Brackets

*It is strongly suggested that you position your loudspeakers, then mark & drill the holes in the mounting walls before you attach the bracket to the loudspeaker, as it is much easier to check positioning and fit of the holes without the weight of the loudspeaker.*

#### **The EMS-81 is designed to work with OmniMount™ Series 30 or PowerDrive™ Series 75 products.**

Lie the enclosure on its front and remove the four M6 countersunk points on the rear of the enclosure. Position the loudspeaker-side of the bracket as required, reinstate the bolts and retighten. The bracket and EMS-81 can now be mounted using the holes you have pre-drilled.

#### **The EMS-81 is designed to work with OmniMount™ Series 60 or PowerDrive™ Series 100 products.**

Lie the enclosure on its front and remove the four M6 countersunk points on the rear of the enclosure. Position the loudspeaker-side of the bracket as required, reinstate the bolts and retighten. The bracket and EMS-121 can now be mounted using the holes you have pre-drilled. This method is the same for all variants of the EMS-121 (EMS-121, EMS-121w, EMS-121h).

#### Safety Considerations

When utilising any suspension method, a secondary safety must be used. For any suspension method, remove one of the rear M10 countersunk machine screws and replace with a forged should M10 eyebolt. A safety steel can then be attached to this and connected to your safety point. **If you are in any doubt whatsoever about how to safely suspend your loudspeakers, do not hesitate to contact your EM Acoustics representative who will be able to refer you to a qualified rigging company for advice.**

### Installation of the DA-1 Power Amplifier Module

The EMS-152 fullrange loudspeaker and EMS-215 subwoofer can accept the EM Acoustics DA-1 digital power amplifier module. One DA-1 is used to drive one loudspeaker, in the following configurations:

**EMS-152 – bridge-mono mode, with the two amplifier channels driving the internal passive circuitry.**

**EMS-215 - two channel mode, with each drive unit driven by one channel.**

To install the DA-1, lie the enclosure on its front. Using a 4mm Allen Key, carefully undo the six M5 socket head bolts holding the connector panel door in place on the rear of the enclosure. Remove the connector panel door and disconnect the four-pin connector on the cable. Put the connector panel aside for future reinstatement.

Connect the four-pin connector into the chassis socket on the bottom edge of the DA-1. Carefully place the DA-1 into the amplifier module housing within the enclosure, reinstate and retighten the M5 socket head bolts.

The DA-1 must be set to the correct program before use, otherwise severe damage can occur to your loudspeaker. Please consult your DA-1 user manual for information on recalling programs, and a program listing.

## MAINTENANCE

Your EM Acoustics loudspeakers have been rigorously tested before they leave our factory, to ensure that they give you a lifetime of flawless operation. Should any of your drive units fail and need replacing, please follow the guidelines below.

### EMS-81: Low Frequency Drive Unit

1. Carefully insert a flat bladed screwdriver between the grille and the top of the enclosure, and gently lever the grille upwards. This will ease the grille out of its locating slots along the side of the enclosure, revealing the drive units. Ensure to approach the grille at the top of the enclosure (handle end) as this will prevent the risk of the screwdriver damaging the LF drive unit.
2. Using a 4mm Allen key, remove the eight M5 socket-head bolts holding the drive unit in place, and keep them safe – ensuring you have collected both the shake-proof and flat washers for each bolt. Gently lift the drive unit out of its locating hole – please take care as it is heavy! Carefully disconnect the cables from the drive unit.
3. To reinstate the driver, simply reverse the above procedure. Please observe the correct polarity – red cable to positive terminal, black cable to negative.
4. Reinstall the grille by easing into one side slot, then gently applying a curve to the grille to ease it into the other side.

### EMS-81: High Frequency Drive Unit

1. Follow the procedure above to remove the LF drive unit.
2. Using a 4mm Allen key, remove the four M5 socket-head bolts holding the HF waveguide in place, and as above put them to one side and ensure you have all the washers. Remove the white BAF wadding from inside the enclosure. Reaching inside through the LF drive unit hole, lift the compression driver upwards from behind to expose the two M5 hex head bolts that attach the drive unit to the waveguide. Using an 8mm spanner, undo these bolts to lift the waveguide clear. The HF drive unit can then be removed through the LF drive unit hole – once the cables have been disconnected.
3. To reinstate the drive unit, reconnect the cables (white cable to positive terminal, yellow cable to negative) and reposition below the HF waveguide hole. Using an 8mm spanner, retighten the M5 hex head bolts and sit the waveguide back in place before reinstating the four socket-head bolts. Avoid over-tightening these bolts as this may crack the waveguide. **Note also the dispersion orientation of the waveguide** – the small marks on two sides of the waveguide mounting flange indicate the 90-degree dispersion plane.
4. Reinstall the BAF wadding, and the LF driver as described in point 3 above (LF driver removal).
5. Reinstall the grille by easing into one side slot, then gently applying a curve to the grille to ease it into the other side.

#### EMS-121: Low Frequency Drive Unit

1. Carefully insert a flat bladed screwdriver between the grille and the top of the enclosure, and gently lever the grille upwards. This will ease the grille out of its locating slots along the side of the enclosure, revealing the drive units. Ensure to approach the grille at the top of the enclosure as this will prevent the risk of the screwdriver damaging the LF drive unit.
2. Using a 5mm Allen key, remove the eight M6 socket-head bolts holding the drive unit in place, and keep them safe – ensuring you have collected both the shake-proof and flat washers for each bolt. Gently lift the drive unit out of its locating hole – please take care as it is heavy! Carefully disconnect the cables from the drive unit.
3. To reinstate the driver, simply reverse the above procedure. Please observe the correct polarity – red cable to positive terminal, black cable to negative.
4. Reinstall the grille by easing into one side slot, then gently applying a curve to the grille to ease it into the other side.

#### EMS-121: High Frequency Drive Unit

1. Carefully insert a flat bladed screwdriver between the grille and the top of the enclosure, and gently lever the grille upwards. This will ease the grille out of its locating slots along the side of the enclosure, revealing the drive units. Ensure to approach the grille at the top of the enclosure as this will prevent the risk of the screwdriver damaging the LF drive unit.
2. Using a 5mm Allen key, remove the four M6 socket-head bolts holding the HF waveguide in place, and as above put them to one side and ensure you have all the washers. Lift the waveguide out of the mounting hole and disconnect the cables.
3. To remove the drive unit, undo the three M5 hex head bolts that attach the drive unit to the waveguide using an 8mm spanner.
4. To reinstate the drive unit, reattach the M5 hex head bolts and retighten. Reconnect the cables (white cable to positive terminal, yellow cable to negative) and reposition the waveguide in the mounting hole before reinstating the four M6 socket-head bolts.
5. Reinstall the grille by easing into one side slot, then gently applying a curve to the grille to ease it into the other side.

### EMS-152: Low Frequency Drive Unit

1. Carefully lift back the foam on the top & bottom edges of the grille. Remove the five PoziDrive screws (3 top, 2 bottom using a PZ2 screwdriver) and insert a flat-blade screwdriver under the grille. This can then be used to ease the grille out of its locating slots.
2. Using a 5mm Allen Key, undo the six bolts securing the drive unit in place. The drive unit can then be lifted out of place by using your finger or a flat blade screwdriver into the recesses in the baffle. Carefully disconnect the cables from the drive unit.
3. To reinstate the drive unit, simply reverse the above procedure. Please observe correct polarity – red cable to positive terminal, black to negative. When tightening the six M6 bolts holding the drive unit in place, it is a good idea to run a sine wave signal through the enclosure to ensure that the drive unit is evenly tensioned around its circumference. Uneven tension will be apparent by the sound of the voice coil rubbing.
4. Reinstall the grille by easing into one slot, then gently applying a curve to the grille and easing it into the other slot. Reinstall the screws and push the foam back into place.

### EMS-152: High Frequency Drive Unit

1. Follow the procedure above to remove the grille.
2. Using a 5mm Allen Key, undo the ten bolts securing the waveguide in place. The assembly can then be lifted out of place. Carefully disconnect the cables from the drive unit as soon as you can reach them to avoid placing unnecessary strain on the crossover network.
3. To remove the drive unit from the waveguide, use a 7/16" spanner to undo the four locking nuts.
4. To reinstall the drive unit, simply reverse the above procedure. Ensure when reconnecting the cables that you not only observe correct polarity (white to positive terminal, yellow to negative) but also that the cable threads through the HF support brace, otherwise it will prevent the drive unit sitting correctly in place. Reposition the waveguide correctly and then reinstall the ten bolts, ensuring you have all three washers for each bolt (shakeproof, flat steel and flat nylon).
5. Reinstall the grille by easing into one slot, then gently applying a curve to the grille and easing it into the other slot. Reinstall the screws and push the foam back into place.

### EMS-152: HF Diaphragm replacement

1. Lie the enclosure on its front.
2. Using a 3mm Allen key, undo the four countersunk M5 bolts holding the rear HF door in place.
3. Disconnect the cables, and using a 3mm Allen key, undo the bolts securing the back cap of the driver.
4. Use a PZ2 screwdriver to remove the screws holding the diaphragm in place.
5. Sit a new diaphragm in place, and reinstall the screws. Reconnect the cables and run a sine wave signal through the enclosure to ensure that the diaphragm is properly centred before applying final tension to the diaphragm screws.
6. Reposition the rear door and retighten the M5 countersunk bolts.

## EMS-215: Low Frequency Drive Units

**NOTE: ONLY ATTEMPT TO REMOVE DRIVE UNITS WITH THE EMS-215 IN AN UPRIGHT POSITION!**

1. Carefully lift the foam along the long edges of the grille to expose the three locating screws on each side. Using a No.2 Pozidrive screwdriver, undo these screws and keep them to one side.
2. Insert a flat bladed screwdriver between the enclosure and the long edge of the grille, and gently lever the grille upwards. This will ease it out of its locating slots down the shorter sides.
3. Using a 10mm spanner or socket driver, undo the six M6 hex head bolts holding the lower drive unit in place. Remove these bolts and ensure that you have both shake-proof and flat washers.
4. Lift the drive unit out of the mounting hole, ensuring that you do not hit the drive unit above when removing it. Take care as the drive units are very heavy. Disconnect the cables before lifting the drive unit clear.
5. To remove the other drive unit, turn the enclosure the other way up and repeat the procedure.
6. To reinstate the drive unit, simply reverse the procedure above, ensuring that you have the correct polarity on the drive unit cables (red cable to positive terminal, black cable to negative).
7. Reinstall the grille by easing into one side slot, then gently applying a curve to the grille to ease it into the other side.
8. Reinstall the six Pozidrive screws to secure the grille in place.

## **WARRANTY**

### Limited Warranty

This EM Acoustics loudspeaker product is warranted to the original end-user purchaser and all subsequent owners for a period of **three 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 74, 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.**

## APPENDIX A – TECHNICAL SPECIFICATIONS

EM Acoustics operates a continuous process of research and development, and as such reserves the right to alter specifications without notice.

### EMS-81

Enclosure Type:	2-way, reflex loaded
Dimensions (HxWxD, mm/ins):	461/18.1 x 308/12.1 x 268/10.6
Net Weight:	13kg
Frequency Response (+/- 3dB):	80Hz – 20KHz
Sensitivity:	96dB, 1W/1m
Dispersion:	90°H x 60°V (rotatable)
Drive Units:	8" (203mm) LF cone drive unit 1" (25mm) exit HF compression drive unit
Power Handling:	250W RMS, 500W Program
Maximum SPL:	120dB continuous, 126dB peak
Nominal Impedance:	8 ohms
Crossover:	UniPhase internal passive
Connectors:	2 x Neutrik Speakon™ NL4MP
Enclosure:	15mm (5/8") Finnish Birch plywood
Rigging/Suspension:	10 x M10 threaded fittings, 4 x M6 threaded fittings 35mm polemount socket
Grille:	Acoustically transparent black foam on expanded steel mesh
Options:	Colours Connectors EMS-81i (install version)
Spares & Accessories:	FC-81v vertical flying cradle FC-81h horizontal flying cradle DFB-81 dual flying bar DU-802 replacement LF drive unit CDU-1001 replacement HF compression drive unit RK-802 re-cone kit for DU-802 RD-1001 replacement diaphragm for CDU-1001 RFG-81 replacement foam/grille UN-1/81 UniPhase crossover network – EMS-81 version

## EMS-121

Enclosure Type:	2-way, reflex loaded
Dimensions (HxWxD, mm/ins):	595/23.4 x 402/15.8 x 341/13.4
Net Weight:	22kg
Frequency Response (+/- 3dB):	65Hz – 20KHz
Sensitivity:	98dB, 1W/1m
Dispersion:	60°H x 40°V (EMS-121) 90°H x 40°V (EMS-121w)
Drive Units:	12" (305mm) LF cone drive unit 1" (25mm) exit HF compression drive unit
Power Handling:	350W RMS, 700W Program
Maximum SPL:	126dB continuous, 132dB peak
Nominal Impedance:	8 ohms
Crossover:	UniPhase internal passive
Connectors:	2 x Neutrik Speakon™ NL4MPR
Enclosure:	15mm (5/8") Finnish Birch plywood
Rigging/Suspension:	12 x M10 threaded fittings, 4 x M8 threaded fittings 35mm polemount socket
Grille:	Acoustically transparent black foam on expanded steel mesh
Options:	Colours Connectors EMS-121i (install version) EMS-121h (horizontal install version)
Spares & Accessories:	FC-121v vertical flying cradle FC-121h horizontal flying cradle DFB-121 dual flying bar DU-1202 replacement LF drive unit CDU-1001 replacement HF compression drive unit RK-1202 re-cone kit for DU-1202 RD-1001 replacement diaphragm for CDU-1001 RFG-121 replacement foam/grille UN-1/121 UniPhase crossover network – EMS-121 version

## EMS-152

Enclosure Type:	2-way, medium-Q reflex loaded
Dimensions (HxWxD, mm/ins):	695/27.4 x 488/19.2 x 485/19.1
Net Weight:	42kg
Frequency Response (+/- 3dB):	65Hz – 18KHz
Sensitivity:	98dB, 1W/1m
Dispersion:	60°H x 40°V (EMS-152) 90°H x 40°V (EMS-152w)
Drive Units:	15" (381mm) LF cone drive unit 2" (50mm) exit HF compression drive unit
Power Handling:	600W RMS, 1200W Program
Maximum SPL:	132dB continuous, 138dB peak
Nominal Impedance:	8 ohms
Crossover:	UniPhase2 internal passive
Connectors:	2 x Neutrik Speakon™ NL4MPR
Enclosure:	15mm (5/8") Finnish Birch plywood
Rigging/Suspension:	6 x M10 threaded fittings
Grille:	Acoustically transparent black foam on expanded steel mesh
Options:	Colours Connectors EMS-152w
Spares & Accessories:	FC-152v vertical flying cradle DFB-152 dual flying bar VFA-152 Variable Angle flying bracket DU-1503 replacement LF drive unit CDU-2001 replacement HF compression drive unit RK-1503 re-cone kit for DU-1503 RD-2001 replacement diaphragm for CDU-2001 RFG-152 replacement foam/grille UN-2/152 UniPhase crossover network

## EMS-215

Enclosure Type:	Dual driver quasi-bandpass
Dimensions (HxWxD, mm/ins):	823/32.4 x 516/20.3 x 700/27.6 (excl. wheels)
Net Weight:	65kg
Frequency Response (+/- 3dB):	45Hz – 150Hz
Sensitivity:	100dB, 1W/1m
Drive Units:	2 x 15" (381mm) LF cone drive unit
Power Handling:	800W RMS, 1600W Program
Maximum SPL:	131dB continuous, 137dB peak
Nominal Impedance:	4 ohms
Crossover:	Active, recommended below 150Hz
Connectors:	2 x Neutrik Speakon™ NL4MPR
Enclosure:	18mm (3/4") Finnish Birch plywood
Rigging/Suspension:	3 x 35mm polemount sockets
Grille:	Acoustically transparent black foam on expanded steel mesh
Options:	Colours Connectors EMS-215i (install version)
Spares & Accessories:	DU-1501 replacement LF drive unit RK-1501 re-cone kit for DU-1501 RFG-215 replacement foam/grille