

WHITE ACOUSTICS

WA 15S

Professional **Loudspeaker**



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2. Introduction

The White Acoustics WA 15S is a 15" direct radiating bass loudspeaker system. As the ideal companion to the White Acoustics WA 12F loudspeaker, it offers extended bass response for installations that also require an ultra-compact cabinet with both flying and wall-bracket mounting capabilities.

Incorporating a high-efficiency 15" driver, the WA 15S combines powerful, natural bass response with compact dimensions. M10 flying points located around the cabinet facilitate quick, easy installation using the EBS10 Eye Bolt Set.

Capable of delivering high sound pressure levels with extremely low distortion, the WA 15S is solidly built to ensure optimum performance as well as exceptional long-term reliability.

3. Unpacking

Each WA 15S loudspeaker is carefully tested and inspected prior to shipment. After unpacking, please look for any exterior physical damage, and save the carton and any relevant packaging materials in case the loudspeaker again requires packing and shipping. In the event that damage has been sustained in transit notify your dealer and the shipping carrier immediately.

4. Connectors / Cabling

The WA 15S is fitted with 4-pole speakON® connectors. Contacts will accept 6 sq. mm wire with an outside diameter of up to 15 mm and a current rating of 30 A. The pins of the two Speakon sockets identified input/output on the rear of the input panel are paralleled within the enclosure. White Acoustics have adopted the following wiring standard for the product range:

speakON Connector	Signal
Pin 1+	LF1+
Pin 1-	LF1-
Pin 2+	N/A
Pin 2-	N/A

When choosing cable type, it is important select the correct cross sectional area in relation to the cable length and the load impedance. A small cross sectional area will increase the cable's series resistance, inducing power loss and response variations (damping factor). Connectors wired with 2.5 sq. mm (12 gauge) cable will be satisfactory under normal conditions; with very long cable runs, the wire size should be increased. Please refer to the following table for guidance:

Cable Run (m)	C.S.A. Of Each Conductor (mm)	Cable Resistance (ohms)	% Power Loss into 8 ohms load	% Power Loss into 4 ohms load
10	2.5	0.14	1.7	3.5
	4.0	0.09	1.1	2.2
	6.0	0.06	0.73	1.5
25	2.5	0.35	4.3	8.6
	4.0	0.22	2.7	5.4
	6.0	0.14	1.8	3.6
50	2.5	0.69	8.6	17.0
	4.0	0.43	5.4	11.0
	6.0	0.29	3.6	7.2
10	2.5	1.38	17.0	35.0
	4.0	0.86	11.0	22.0
	6.0	0.58	7.2	14.00

5. Polarity Checking

Checking the polarity of the wiring before the speaker system is mounted or flown will help ensure satisfactory performance. If you do not have a pulse based polarity checker, you may check LF units as follows: Connect two wires to the + and - terminals of a PP3 (9 V) battery. Apply the wire connected to the positive (+) terminal of the battery to the speaker cable leg which you believe to be connected to pin 1+ of the speaker connector; likewise connect the negative (-) terminal of the battery to pin 1-.

If you have wired it correctly, the LF drive unit will move forward. At this point, connect the positive (+) speaker lead to the + terminal on the amplifier and the negative (-) lead to the - terminal on the amplifier. However, if the LF driver moves backwards with the battery test, the input connections need to be inverted before connecting the amplifier.

If problems are encountered, inspect the cable wiring. Note that different amplifier manufacturers may utilise different pin configurations and polarity conventions; if you are using amplifiers from more than one manufacturer, check the polarity at the amplifiers as well as at the loudspeakers.

6. Amplification and Power Handling

As with all professional loudspeaker systems, the power handling is a function of voice coil thermal capacity. Care should be taken to avoid overdriving the amplifier into clipping. Damage to the loudspeaker will be sustained if the amplifier is driven into clipping for any extended period of time. Headroom of at least 3 dB should be allowed.

When evaluating an amplifier, it is important to take into account its behaviour under low impedance load conditions. A loudspeaker system is highly reactive, and with transient signals it can require more current than the nominal impedance would indicate. Generally a higher power amplifier running free of distortion will do less damage to the loudspeaker than a lower power amplifier that is continually clipping. A high powered amplifier running at less than 90% of output power generally sounds superior to a lower power amplifier running at 100%. An amplifier with insufficient drive capability will not allow the full performance of the loudspeaker to be realised. (See technical specifications section for recommended amplifier power.)

When using amplifiers from different manufacturers in a single installation, make certain that all have very closely matched gains. (Variation should be less than +/- 0.5 dB.) This precaution is important to the overall system balance when only a single active crossover is being used with multiple cabinets. When possible, it is recommended that the same amplifiers be used throughout.

7. Crossovers

For optimal performance, the WA 15S has been designed to operate with White Acoustics WA 12F loudspeaker, where overall system control is achieved by using the White Acoustics WA 2.4X System Controller. The WA 2.4X has been factory preset to provide the recommended crossover points, delays and overall system balance. Please refer to the WA 2.4X Operation Manual for operation instructions.

If you will be using an alternative loudspeaker management system from another manufacturer, please contact your distributor for the correct parameter settings, or refer to the recommended crossover points in the technical specifications section of this manual.

8. Equalisation

The WA 15S requires no equalisation or correction to overcome system limitations; equalisation is necessary only to compensate for difficult acoustic environments. Over-equalisation can reduce system headroom and introduce phase distortion, resulting in degraded sound. If equalisation is required, it should be applied gently and smoothly. Extreme equalization may be detrimental of overall sound quality.

9. Flying

The WA 15S incorporates convenient M10 flying points. The unit can be flown by utilising the EBS10 Eye Bolt Set, allowing for ease of installation and flexibility with the highest levels of safety. As with any flying system, safety can only be guaranteed when all precautions have been observed and procedures implemented correctly.



The installation of this product must be carried out in conformity with local building codes and standards. If necessary, consult your local safety standards officer before installing any product. Alternatively, check any laws or bylaws. White Acoustics will not be held responsible for any damage caused by the improper installation of any flying gear or loudspeaker.

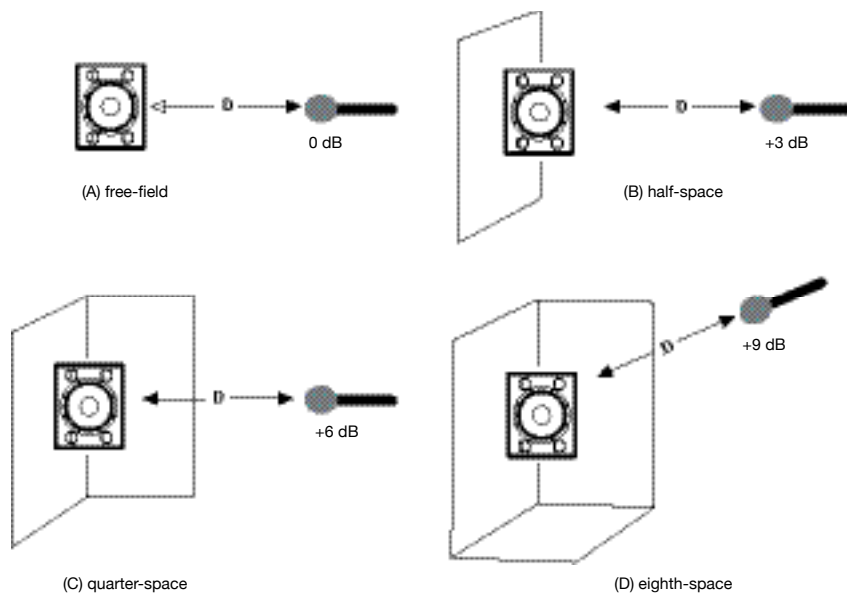
10. Positioning

When a bass loudspeaker is used in an environment with boundary surfaces, its placement affects its frequency response. When such effects are properly understood, they can be applied to produce the desired sound quality without the aid of additional amplification.

In the diagram below, figure (A) depicts a loudspeaker in free field or anechoic conditions. We measure its sound pressure level at a fixed distance (D), and refer to this as our reference level, or 0 dB SPL.

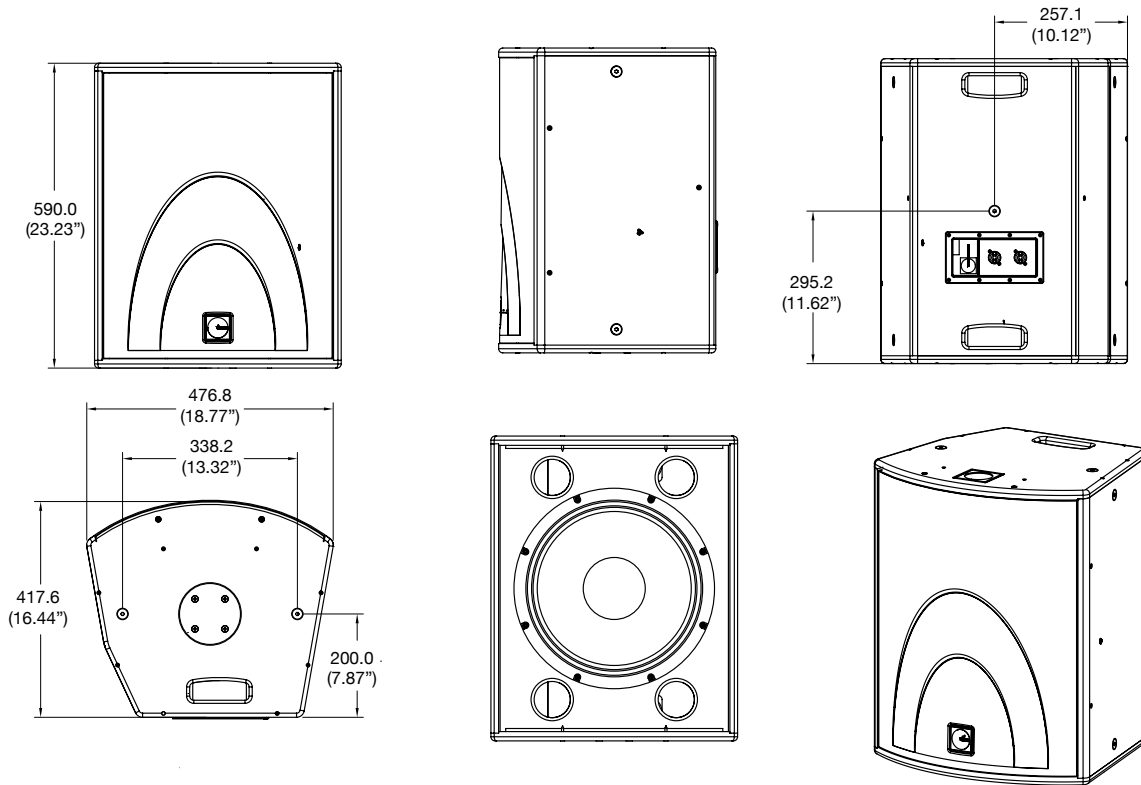
If we now place a large reflective surface (such as a wall, ceiling or floor) next to the loudspeaker, as show in figure (B), the sound radiated towards the boundary is reflected back into the room. As a result, the sound pressure level can increase by as much as 3 dB, producing the same effect as doubling the available amplifier power. Because the loudspeaker is radiating its power into half as much space, this is known as half space loading. For each additional boundary, the SPL can increase by a further 3 dB. Corner placement, or eighth space loading, can increase a bass speaker's efficiency by up to 9 dB.

This effect is not the same at all frequencies, however. Essentially, loudspeakers are only omnidirectional at low frequencies, where the wavelength is large in comparison to the loudspeaker. At higher frequencies sound radiates in a more directional manner. We can position full range loudspeakers next to a boundary in order to boost the lower frequencies while the highs remain unchanged. In addition, placing bass cabinets close together results in coupling which also increases bass output.



How SPL Increases Due To Boundary Effects

12. Dimensions



13. Technical Specifications

Following are the WA Series technical specifications. These figures are accurate at the time of printing but please note that all figures are subject to change without notice.

Model	WA 15S
System Type	Bass direct radiating loudspeaker - Vented
Frequency Response (-3 dB) ¹⁾	54 Hz - 3000 Hz
Frequency Range (-10 dB) ¹⁾	45 Hz - 4000 Hz
System Sensitivity (1 W @ 1 m) ²⁾	100 dB (1 W = 2.83 V for 8 ohms)
Power Handling	1000 W (average), 2000 W (programme), 4000 W (peak)
Recommended Amplifier Power	1200-2000 W @ 8 ohms
Rated Maximum SPL ²⁾	130 dB (average) 136 dB (peak)
Nominal Impedance	8 ohms
Driver Complement	1 x 380 mm (15") Bass driver
Active Crossover (external)	Low Pass filter 100 Hz - 500 Hz, 24 dB/octave Recommended Hi Pass filter 45 Hz, 24 dB/octave
Construction	
Enclosure	71.2 litre vented, 18 mm (0.71") birch plywood. Vented and internally braced
Finish	Textured black paint. Powder coated perforated steel grille
Connectors	2 x speakON NL4MP in/out
Fittings	2 x integrated carrying handles. Blanking plate allows installation of a 35 mm pole-mounting socket. 8 x M10 bracket inserts allowing for landscape or portrait mounting 1 x M10 insert for pull-back
Dimensions	W: 480 mm (18.9"), H: 590 mm (23.23"), D: 420 mm (16.54")
Weight	TBA

Note 1): Average over stated bandwidth. Measured at 1 metre on axis.

Note 2): Unweighted pink noise input, measured at 1 metre in half-space.

All specifications are subject to change without notice.

14. Warranty

No Maintenance of the WA Series Loudspeakers is necessary.

All White Acoustics professional loudspeaker products are covered by a 5 year warranty from the date of manufacture, subject to the absence of misuse, overload or accidental damage. Claims will not be considered if the serial number has been altered or removed. Work under warranty should only be carried out by a White Acoustics dealer or service agent. This warranty in no way affects your statutory rights.

If your White Acoustics product requires repair, please visit www.whiteacoustics.com to find your local dealer or distributor.

Do not ship any product to White Acoustics without previous authorisation.

Our policy commits us to incorporating improvements to our products through continuous research and development. Please confirm current specifications for critical applications with your supplier.

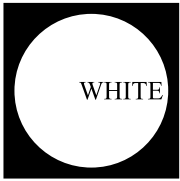
13. Declaration of Conformity

The following apparatus is/are manufactured in the United Kingdom by White Acoustics Ltd. of Rosehall Industrial Estate, Coatbridge, Scotland, ML5 4TF and conform(s) to the protection requirements of the European Electromagnetic Compatibility Standards and Directives relevant to Domestic Electrical Equipment. The apparatus is designed and constructed such that electromagnetic disturbances generated do not exceed levels allowing radio and telecommunications equipment and other apparatus to operate as intended, and, the apparatus has an adequate level of intrinsic immunity to electromagnetic disturbance to enable operation as specified and intended.

Details of the Apparatus:	White Acoustics Loudspeaker
Model Number:	WA 15S
Associated Technical File:	EMCi6
Applicable Standards:	EN 50081-1 Emission EN 50082-1 Immunity



Engineering Director
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