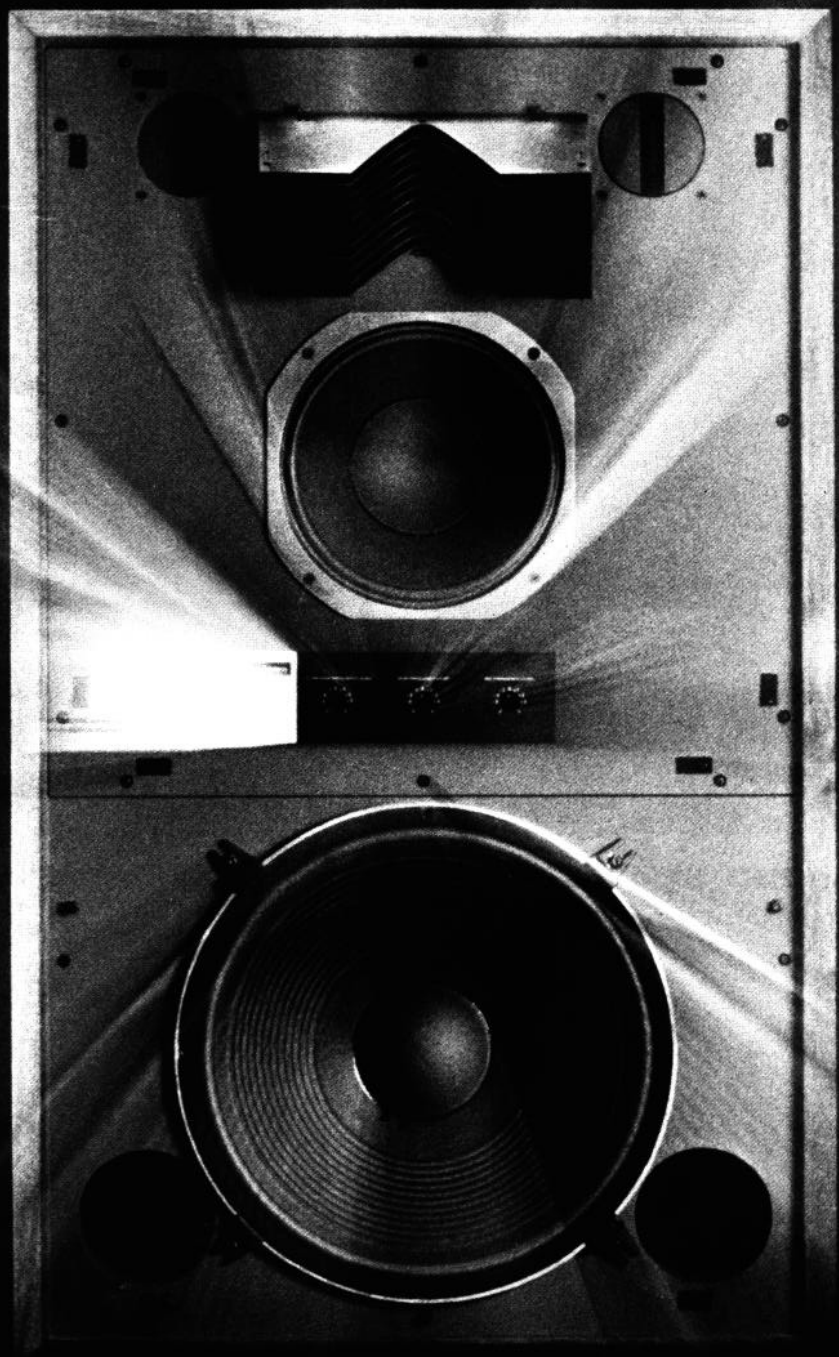
JBL Professional Series

# Model 4343B Four-Way Studio Monitor



**Accurate, smooth reproduction from 35 to 20,000 Hz, ± 3 dB**

**94 dB SPL, 1 W, 1 m**

**102 dB SPL at 10 feet at one-half rated power input**

**Mountable in vertical or horizontal orientation**

**Components: 380 mm (15 in) low frequency loudspeaker, 250 mm (10 in) midrange loudspeaker, high frequency compression driver with horn/lens assembly and ultra-high frequency transducer**

**Balance controls located behind the removable grille**

**Rear mounted switch for bi-amplification or full passive crossover**

**Oiled walnut or textured gray enclosure**

## The 4343B Studio Monitor

The 4343B represents an extension of the research and development effort that produced the 4350 Studio Monitor, JBL's top system, which uses dual low frequency drivers. This new monitor accurately reproduces the full range of fundamentals and overtones in music at sound pressure levels approximating those of an original performance.

The exceptionally smooth wide-band reproduction, clarity, transient response and low distortion of the 4343B results from total integration of the components that make up the four-way system so that each transducer reproduces only that portion of the audio spectrum for which it is specifically designed. Deliberately restricting the operating bandwidth of the individual drivers results in maximization of each unit's transient response. Another benefit of bandwidth limitation is that each driver operates only in the region of the audio spectrum through which it exhibits controlled sound distribution, thus a dispersion pattern for the complete system is achieved which is ideal for studio use. The passive frequency dividing network supplied with the 4343B controls the acoustic output of all the individual transducers, and may be switched for bi-amplification.

## Low Frequency Loudspeaker

The 380 mm (15 in) low frequency loudspeaker is mounted in a ported enclosure having an internal volume of 156 litres (5.5 $ft^3$). The driver features extreme, solid low frequency reproduction with smooth response well past its crossover frequency. The unit is energized by an 8.5 kg (18⅝ lb) magnetic assembly incorporating JBL's unique Symmetrical Field Geometry (SFG), a design which reduces second harmonic distortion to inconsequential levels. The assembly concentrates a magnetic field having a flux density of 1.2 T (12,000 gauss) in the voice coil gap. The 100 mm (4 in) edgewound copper ribbon voice coil is hand wound on a heat resistant support. The support is affixed to a rigid cone having optimum mass, density and rigidity for exceptional transient response and maximum efficiency with the bandwidth of the driver.

## Midrange Loudspeaker

The smooth performance and instantaneous transient response of the 250 mm (10 in) midrange loudspeaker is largely responsible for the outstanding instrumental clarity, vocal definition and dimensional accuracy of the system. The magnetic assembly, weighing 4.7 kg (10¼ lb), utilizes JBL's SFG design to reduce second harmonic distortion. The 75 mm (3 in) edgewound copper ribbon voice coil is suspended within a powerful magnetic field having a flux density of 1.02 T (10,200 gauss). The integrally stiffened cone is terminated with an exclusive JBL ring compliance that allows long excursions while maintaining linear travel.

## High Frequency Compression Driver

The high frequency compression driver provides smooth, accurate response and is capable of delivering the high power output levels required in monitor applications. The closed magnetic assembly is energized by an Alnico V magnet, weighs 4.5 kg (10 lb) and achieves a flux density of 1.9 T (19,000 gauss) in the voice coil gap. A ring of pure silver deposited on the circumference of the pole piece maintains uniform impedance through the highest frequencies, extending the bandwidth of the driver. The diaphragm, pneumatically formed of 0.05 mm (0.002 in) aluminum foil stock, is driven by a 44 mm (1.75 in) edgewound aluminum ribbon voice coil. The wavefront emerging from the diaphragm is directed through the concentric channels of a phasing plug prior to distribution by the horn/lens assembly.

## Horn/Lens Assembly

Output from the high frequency compression driver is distributed through a controlled pattern by the horn/lens assembly. The horn is formed of a rigid casting to eliminate spurious resonance. The exponential taper rate of the horn controls the expansion of the wavefront providing proper acoustic loading of the driver diaphragm and determines the vertical dispersion pattern of the assembly. The



acoustic lens functions in a manner analogous to a divergent optical lens. Its 11 plates, set at a precise angle to the enclosure baffle panel, provide controlled propagation of high frequency acoustic energy in the horizontal plane.

### Ultra-High Frequency Transducer

Overtones above 9000 Hz are reproduced by a compression driver and diffraction horn specifically designed for reproduction and dispersion of energy at the extreme high end of the audio spectrum. The compression driver consists of a 1.5 kg (3.25 lb) magnetic assembly energized by an Alnico V magnet. The 44 mm (1.75 in) edgewound aluminum ribbon voice coil, suspended within a field having a flux density of 1.65 T (16,500 gauss) is affixed to a heat resistant support bonded to a ring diaphragm pneumatically formed of 0.006 mm (0.0022 in) aluminum foil. Output from the diaphragm is directed through the integral diffraction horn, which produces the unit's wide high frequency dispersion pattern.

### Frequency Dividing Network

The 4343B is provided with a high level, passive frequency dividing network for the three transitions of the system. The network is fitted with a rear-mounted switch and separate input terminals for bi-amplification. The circuitry has been designed with consideration for the various performance characteristics of the drivers and their location on the enclosure baffle panel. The network has been designed for continuous high power application; capacitors are non-inductive, non-polarized types with high AC current capacity, and special inductors are used to minimize power losses within the network. Each inductor is calibrated on a sensitive electronic bridge and its value set precisely.

A special circuit card providing the precise cross-over characteristics for bi-amplification of the 4343B is available for use in the JBL 5233 or 5234 Electronic Frequency Dividing Network. Conventional electronic networks can be used, but they may not have the exact frequency and filter slope characteristics required for optimum performance of the system.

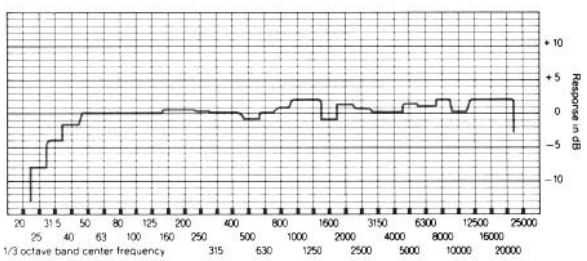
### Enclosure

In keeping with current trends in studio design that encourage creativity, JBL studio monitor enclosures feature contemporary styling and are offered in two finishes, each with a complementary grille color. The enclosure, however, contributes much more than striking appearance. The low frequency loudspeaker is housed in a chamber having an internal volume of 156 litres (5.5 $ft^3$). The midrange loudspeaker is enclosed in a separate, isolated sub-chamber having an internal volume of 14 litres (0.5 $ft^3$). The internal volume of the acoustic chambers and physical configuration of the ducted ports are carefully calibrated to properly load the low frequency and midrange loudspeakers for optimum bass response and to control cone excursion, thus minimizing distortion and maximizing power handling capacity of the drivers. To eliminate resonance, the enclosure is constructed of dense 19 mm (0.75 in) and 25 mm (1 in) stock with a 15-ply baffle panel; all joints are carefully interlocked and glued; the back, side, top and bottom panels are lined with acoustic damping material and are each stiffened by multiple braces glued and screwed to the panel and to the adjacent surfaces of the enclosure. The baffle section which supports the midrange, high frequency and ultra-high frequency transducers may be rotated 90° left or right for horizontal system installations.

### Test Parameters

The accompanying graph and specifications were compiled from measurements made under standard laboratory test conditions. The complete loudspeaker system, including the enclosure, was mounted flush in the center of a large, flat baffle in an anechoic environment. Calibrated condenser microphones were suspended at a measured distance from the sound source, sufficiently out of the near field. All associated electronic equipment was checked and calibrated before tests were run.

### Response




Frequency response of the 4343B taken with ⅓-octave band pink noise. Measured response contour of a typical system averaged through an inclusive arc of 60° in the horizontal and 30° in the vertical planes does not deviate more than 2 dB from the above curve.

## Specifications

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|---|---|
| Maximum Power Input[1] | |
| Bi-amplification | |
| Below 300 Hz | 75 W continuous sine wave |
| Above 300 Hz | 75 W continuous sine wave |
| Single amplification | 75 W continuous sine wave |
| Nominal Impedance | 8 Ω |
| Power Output[2] | 102 dB SPL measured at 3.0 m (10 ft) in a room volume of 57 $m^3$ (2000 $ft^3$) with ½ rated power input |
| Frequency Response | |
| Sine Wave, On-Axis | 35 to 20,000 Hz ±3 dB |
| ⅓-Octave Band | −4 dB at 31.5 Hz, |
| (400 Hz Reference) | +2 dB at 1 kHz, |
| | +2 dB at 20 kHz |
| Polar Response | No less than −3 dB at 60° horizontal and 30° vertical to 16 kHz |
| Sensitivity[3] | 94 dB SPL measured at 1 m (3.3 ft) with 1-watt input averaged from 100 to 1000 Hz |
| Distortion | |
| ½ Power, 100 dB SPL/3.0 m (10 ft), Single Frequency | 1% or less third harmonic generation from 35 to 800 Hz |
| | 2% or less third harmonic generation above 800 Hz |
| Crossover Frequencies[4] | 300, 1250 and 9500 Hz |
| Finish | Textured gray or oiled walnut |
| Grille | Black fabric with the gray finish; Dark blue fabric with walnut |
| Enclosure Volume | |
| Low Frequency Chamber | 156 L 5.5 $ft^3$ |
| Midrange Chamber | 14 L 0.5 $ft^3$ |
| Enclosure Dimensions | 1050 mm x 635 mm x 435 mm 41⅜ in x 25 in x 17⅛ in |
| Net Weight | 84 kg 185 lb |
| Shipping Weight | 92 kg 202 lb |
| Accessories (for bi-amplification) | 5233 Electronic Frequency Dividing Network, single channel; 5234 Electronic Frequency Dividing Network, dual channel; 52-5140 Crossover Card, required for the low frequency transition of the 4343B. |

[1]Power amplifier headroom recommendation is 3 dB minimum, i.e., for a 75-watt rating use a 150-watt amplifier.

[2]Power output measured with a B&K Impulse Precision Sound Level Meter.

[3]Unlike many "theater type" loudspeaker systems that exhibit sensitivity peaks in the midrange region, the 4343B provides substantially the same sensitivity through the full range of audible frequencies. Measured sensitivity below 500 Hz or above 2000 Hz may be considerably greater than that of other systems with higher sensitivity ratings.

[4]The 52-5140 crossover card installed in a JBL electronic frequency dividing network will provide the appropriate crossover characteristics for bi-amplification. If another electronic network is used, a 12 dB/octave filter slope will provide the closest approximation of the 52-5140.

**Caution** Sound pressure levels produced by the 4343B may cause permanent hearing loss. The suggested maximum exposure is 115 dBA for no more than 15 minutes. (Department of Labor Bulletin #334)

JBL continually engages in research related to product improvement. New materials, production methods and design refinements are introduced into existing products without notice as a routine expression of that philosophy. For this reason, any current JBL product may differ in some respect from its published description but will always equal or exceed the original design specifications unless otherwise stated.

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