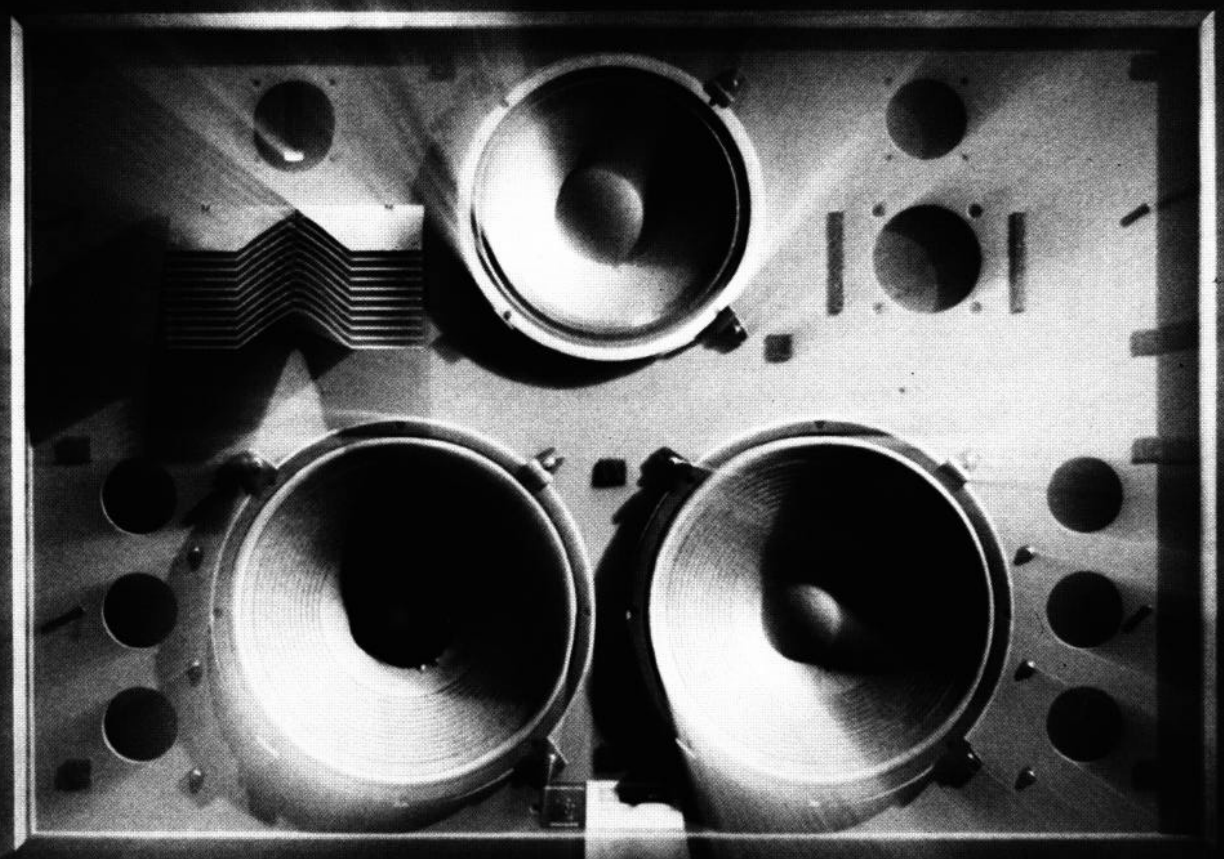
JBL Professional Series

Model 4350B Studio Monitor



Extremely wide-band linear response characteristics, high acoustic output, controlled dispersion pattern.

Components: two 380 mm (15 in) low frequency loudspeakers, 300 mm (12 in) midrange loudspeaker, high frequency compression driver with horn/lens assembly, diffraction horn ultra-high frequency driver.

Rigidly constructed enclosure provides separate acoustic loading of the low frequency and midrange loudspeakers and provides for mirror image mounting of the high frequency and ultra-high frequency drivers.

The 4350B Studio Monitor

The JBL 4350B is the result of an engineering study undertaken to create, regardless of cost, the optimum studio loudspeaker for monitoring recording sessions and for final mixdown of master tapes. A four-way system designed for bi-amplification, it achieves inherently smooth reproduction within three dB from 30 Hz to 20 kHz, controlled high frequency dispersion, and exceptional transient performance. In addition, the 4350 is capable of wide dynamic range with low distortion, and of the high acoustic output required for precise reproduction of the original sounds. It is an indispensable tool, not only for mastering and mixdown, but also for subjective analysis of the entire studio recording and reproducing complex.

Bi-amplification

The two low frequency loudspeakers are driven independently of the other components in the system. This allows the utilization of two moderately powered amplifiers rather than a single, large model, and lessens the possibility of distortion, even at high volume levels.

Low Frequency Loudspeakers

Two 380 mm (15 in) low frequency loudspeakers, mounted in a ported enclosure, provide accurate reproduction and high power handling capacity at very low frequencies. The use of two drivers results in a 3-dB increase in acoustic output and allows twice the power input to the low frequency section. Each loudspeaker is driven by a 100 mm (4 in) diameter voice coil, fabricated of edgewound copper ribbon wire, and an 8.5 kg (18⅝ lb) magnetic assembly with a flux density of 1.2 T (12,000 gauss). The magnetic structure incorporates JBL's unique Symmetrical Field Geometry (SFG) design that reduces second harmonic distortion to inconsequential levels. A compliant cone termination allows long excursions and damps spurious reflections traveling within the cone material.

Midrange Loudspeaker

Music fundamentals lying in the region between 250 Hz and 1.1 kHz are reproduced by a 300 mm (12 in) loudspeaker housed in a sealed sub-chamber and driven by a 100 mm (4 in) edgewound copper ribbon voice coil. The SFG design of the magnetic structure results in exceptionally low levels of second harmonic distortion. The magnetic assembly weighs 8.5 kg (18⅝ lb) and produces a flux density of 1.2 T (12,000 gauss) in the voice coil gap. The driver achieves high acoustic efficiency and effortless reproduction, even at extreme volume levels.

High Frequency Compression Driver

Reproduction from 1.1 to 9 kHz is accomplished by a massive compression driver energized by a magnetic assembly weighing 11 kg (23.75 lb). Its 100 mm (4 in) edgewound aluminum ribbon voice coil, suspended in a magnetic field of 1.8 T (18,000 gauss), drives a diaphragm pneumatically drawn to shape from 0.08 mm (0.003 in) aluminum alloy. Proper phasing of the wavefront is assured by use of a phasing plug. The combination of an extremely powerful, efficient magnetic assembly, edgewound voice coil and large yet lightweight diaphragm results in exceptional transient response and dynamic range.

Horn/Lens Assembly

High frequency output is distributed by an exponential horn combined with a slant-plate acoustic lens. The rigid horn casting couples the output of the high frequency driver to the acoustic lens without adding audible resonance or distortion. The 11 plates of the lens, set at an angle of 38°, operate in a manner analogous to a divergent optical lens, providing controlled propagation of high frequency acoustic energy.

Ultra-High Frequency Transducer

The highest octave of the audio spectrum is reproduced

by a compression driver specifically designed for ultra-high frequency reproduction and dispersion. Its 1.5 kg (3.25 lb) magnetic assembly develops a flux density of 1.65 T (16,500 gauss) and drives a 45 mm (1.75 in) edgewound aluminum ribbon voice coil. The driver utilizes a ring diaphragm pneumatically formed of 0.06 mm (0.0022 in) anodized aluminum foil stock. Output is directed through a diffraction horn providing 90° dispersion in the plane perpendicular to the diffraction slot while restricting dispersion in the vertical plane to approximately 40°. The device maintains smooth response within 3 dB to 20 kHz.

Frequency Dividing Network

The low frequency loudspeakers operate to 250 Hz and require an attenuation rate of 12 dB per octave below and above the crossover frequency. Transition may be accomplished with a JBL 5233 (single channel) or 5234 (dual channel) Electronic Frequency Dividing Network or with one of several electronic crossovers or filtering devices commercially available.

The midrange, high frequency, and ultra-high frequency drivers are regulated by a high-level passive network of the L-C type specifically designed and tested for operation with the transducers of the system. Transition between the midrange loudspeaker and the high frequency compression driver occurs at 1.1 kHz at the rate of 12 dB per octave. The compression driver operates to 9 kHz with high frequency attenuation accomplished by the inherent performance characteristics of the unit. At 9 kHz, the ultra-high frequency driver is brought into operation at 18 dB per octave. A level control is provided.

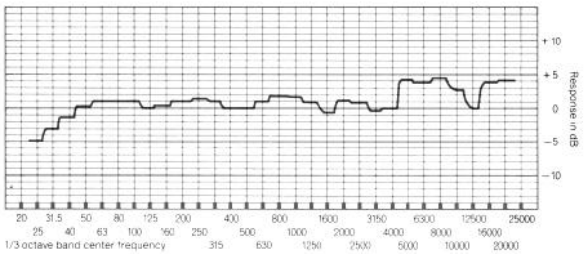
Enclosure

Components of the 4350B are housed in a rigid enclosure incorporating two acoustic chambers. The two low frequency loudspeakers are housed in a bass reflex chamber which has an internal volume of 265 litres (9.5 ft^2). Proper loading to 25 Hz is accomplished by a distributed port consisting of six openings. The midrange loudspeaker is mounted in a second, sealed sub-chamber measuring 45 litres (1.6 ft^3) in volume and designed to prevent acoustical interaction with the low frequency drivers. The sub-chamber also attenuates output of the midrange unit below 200 Hz, thus reducing unwanted peaks in total system response. The enclosure is constructed of 19 mm (¾ in) stock for maximum rigidity with minimum weight. All joints are lock-mitered and glued; panels are heavily braced to prevent unwanted resonances, and interior surfaces are padded to damp spurious reflections and standing waves within the acoustical chambers. All components mount directly to the baffle panel and are accessible from the front of the enclosure.

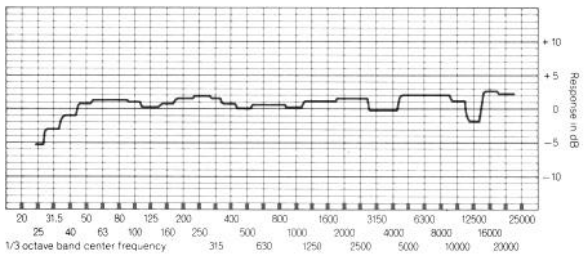
Test Parameters

The accompanying graphs and specifications were compiled from measurements made under standard laboratory test conditions. The loudspeaker system was mounted flush in the center of a large, flat baffle in an anechoic environment. A calibrated condenser microphone was 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.

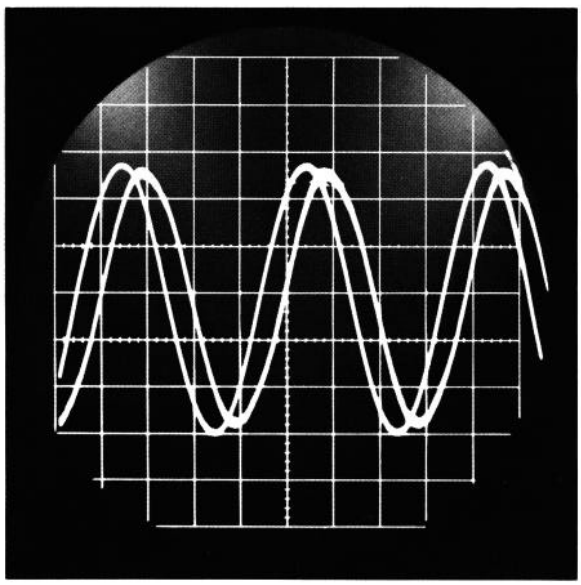
Response



1/3-octave band response taken on-axis with pink noise. Measured response contour of a typical 4350B does not deviate more than 2 dB from the above curve.



1/3-octave band response to pink noise averaged through an inclusive arc of 60° in the horizontal and 30° in the vertical plane.



This unretouched photo shows the actual acoustic output of the low frequency section of the 4350B when driven by 100 W continuous sine wave power at a frequency of 25 Hz. A calibrated condenser microphone, connected directly to the oscilloscope, was used to pick up the output of the loudspeaker system. The first trace, representing the sine wave input, is duplicated by the 4350B and can be seen as the second trace, illustrating the accuracy of the loudspeaker system.

Specifications

Maximum Power Input	
Below 250 Hz	200 watts continuous sine wave at 4Ω
Above 250 Hz	100 watts continuous sine wave at 8Ω
Nominal Impedance	
Below 250 Hz	4Ω
Above 250 Hz	8Ω
Power Output[1]	110 dB SPL pink noise measured at 3 m (10 ft) in a room volume of 57 m′ (2000 ft′) with ½ rated power input (−3 db) 126 dB SPL approximate program peak output measured at 3 m (10 ft) with ½ rated power input (average)
Frequency Response	
Sine wave, on-axis	30 Hz-20 kHz, −3 dB
1/3-octave band (500 Hz reference)	−3 dB at 31.5 Hz, +2 dB at 1 kHz, +2 dB at 16.5 kHz
Polar Response	No less than −3 dB at 60° horizontal and 30° vertical to 12 kHz
Sensitivity[2]	95.5 dB SPL, 1W, 1m (3.3 ft)
Distortion	
½ power, 108 dB SPL, 3 m (10 ft), single frequency	1% or less third harmonic from 35 Hz to 1.2 kHz 3% or less third harmonic from 1.2 to 5 kHz
1/10 power, 101 dB SPL, 3 m (10 ft), single frequency	0.6% or less third harmonic generation from 1.2 to 5 kHz
Crossover Frequencies	
Low	250 Hz electronic, 12 dB/octave
Mid	1.1 kHz
High	9 kHz
Finish	Textured gray or oiled walnut
Grille	Black fabric with the gray finish Dark blue fabric with walnut
Enclosure Volume	
Low Frequency	265 litres (9.5 ft³)
High Frequency	45 litres (1.6 ft³)
Dimensions	890 mm x 1210 mm x 510 mm deep 35 in x 47⅝ in x 20 in deep
Net Weight	118 kg 260 lb
Shipping Weight	138 kg 303 lb
Accessories	5233 Electronic Frequency Dividing Network, single channel 5234 Electronic Frequency Dividing Network, dual channel 52-5140 crossover card for 5233 or 5234 (one card required per channel)

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

[2]Unlike many "theater type" loudspeaker systems that exhibit sensitivity peaks in the midrange region, the 4350 provides substantially the same sensitivity through the full range of audible frequencies. Measured sensitivity below 500 Hz or above 2 kHz may be considerably greater than that of other systems which claim higher sensitivity ratings.

Caution Sound pressure levels produced by the 4350 may cause permanent hearing loss. The suggested maximum exposure is 115 dBA for no more than 15 minutes. (U.S. 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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