Professional Series

Model 4312 Control Monitor

Smooth, powerful, wide-range response within a compact enclosure

Components: 300 mm (12 in), long excursion, low frequency loudspeaker;

130 mm (5 in) midrange loudspeaker; 36 mm (1.4 in) high frequency direct radiator

Mirror-imaged for better stereo imaging

90° dispersion allows vertical or horizontal placement.

JBL

Model 4312 Control Monitor

The latest version of JBL's most popular compact monitor system, the 4312 offers significant improvements on its predecessor, the 4311B. The 4312 incorporates a new high resolution dividing network that provides better transient response. Additionally, the 4312 is offered in mirror-imaged pairs to provide improved stereo imaging. With its wide-band reproduction at the loudness levels required in professional work, the 4312 is ideally suited for control room installations, small studios, mixdown facilities, broadcast monitors, and portable playback systems.

Bass material is reproduced by a powerful, long excursion, 300 mm (12 in) loudspeaker having a 75 mm (3 in) diameter edgewound copper ribbon voice coil operating in a magnetic field of 1.0 T (10,000 gauss). The magnetic assembly weighs 4.7 kg (10¼ lb); free air resonance is approximately 22 Hz. The surface of the cone is coated with an exclusive damping formulation that provides the precise mass and density necessary to optimize bass performance, prevent spurious resonance and provide smooth performance extending into the midrange region.

Transition to the midrange unit is made at a crossover frequency of 1.5 kHz. The 130 mm (5 in) transducer provides clarity and freedom from audible distortion, even at the high loudness levels encountered in professional applications. The transducer is energized by a magnetic assembly having a total weight of 0.74 kg (1⅝ lb) and creating a magnetic field of 1.35 T (13,500 gauss). The 22 mm (⅞ in) diameter copper voice coil drives a 100 mm (4 in) edge-damped cone that operates as a true piston, providing smooth frequency response and wide dispersion throughout its operating range.

Reproduction above 6 kHz is accomplished by a 36 mm (1.4 in) direct radiator. Its 0.74 kg (1⅝ lb) magnetic assembly and 16 mm (⅝ in) diameter copper voice coil drive a cone and center dome with controlled linearity assured by an impregnated cloth termination. The voice coil, suspended in a magnetic field of 1.5 T (15,000 gauss), is unusually large in relation to cone size for high efficiency and exceptional transient response. The small cone diameter is responsible for wide, uniform dispersion of high frequency energy; a ring of dense foam surrounds the moving assembly to damp unwanted radiation and reflections.

The frequency dividing network installed in the 4312 has been designed and tested to achieve the smoothest possible transitions between component loudspeakers. All network components are of the highest quality. Capacitors are non-inductive, non-polarized types with high AC current capacity, built expressly for use in dividing networks and individually tested for conformity to rigid performance standards. Special bypass capacitors are wired in parallel with the larger capacitors to provide improved resolution of the complex transient waveforms.

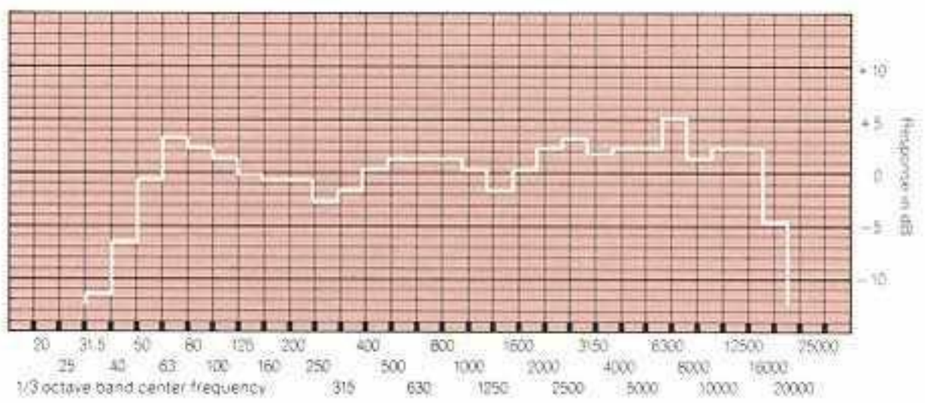
As with all JBL loudspeaker systems, the component transducers, frequency dividing network and enclosure are designed and tested to function as a single, integrated unit. The enclosure is solidly constructed of 19 mm (¾ in) stock throughout with wood-welded joints to prevent unwanted resonance. Internal padding absorbs spurious reflections and standing waves. All components mount directly to the baffle panel and are removable from the front of the enclosure. A ducted port provides proper acoustical loading of the low frequency loudspeaker.

The frequency dividing network of the 4312 is provided with front panel controls to allow separate regulation of output in the 1.5 kHz to 6 kHz range and the region above 6 kHz. Controls are continuously variable from maximum to full off. With suitable settings of the two controls, the frequency response contour of the 4312 can be altered to compensate for almost any acoustical environment, or to achieve the tonal balance desired. Control scales are clearly marked so that special settings can be logged and easily reset when needed.

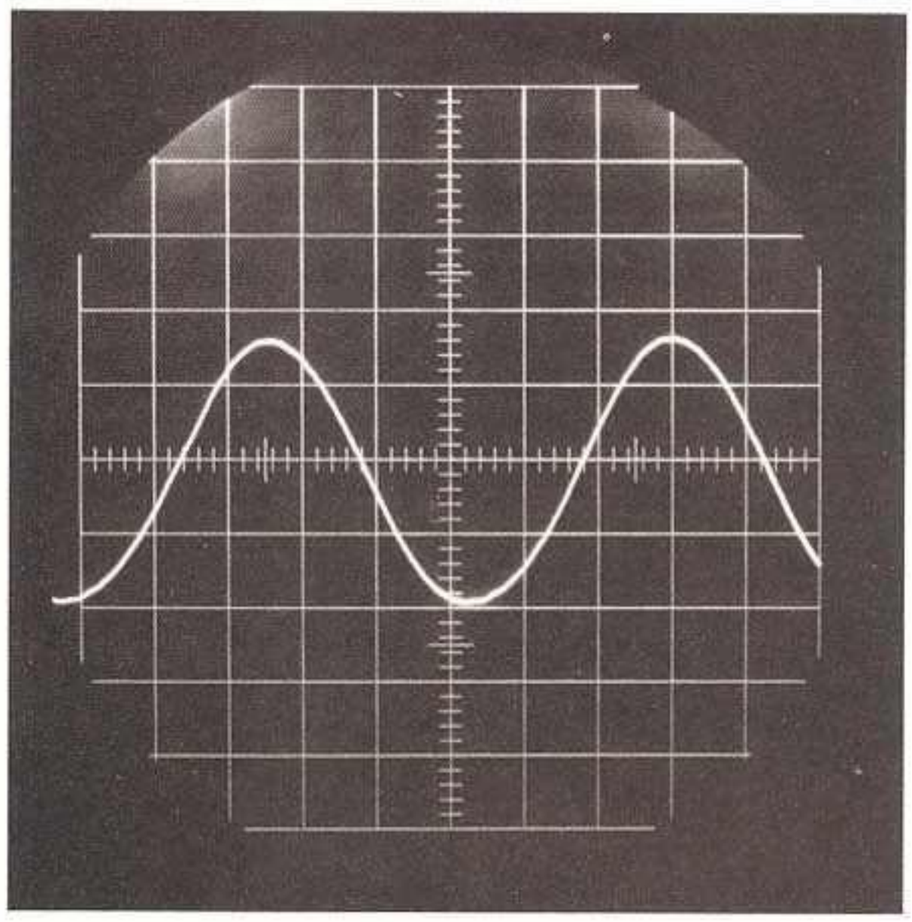
The accompanying graph and specifications were compiled from measurements made under standard laboratory test conditions. The loudspeaker system was mounted flush in the center of a large, flat baffle in an anechoic environment; a calibrated condenser microphone was suspended at a known distance from the sound source, sufficiently far to be safely out of the near field; and all electronic equipment was checked and calibrated before tests were run.

The on-axis frequency response of a typical 4312 does not vary more than ±3 dB from 45 Hz to 15 kHz. Due to the wide-angle characteristics of the midrange and high frequency units and their physical orientation, response measured up to 45° off axis, horizontally or vertically, does not deviate more than 6 dB from on-axis response at 2 kHz nor more than 10 dB at 8 kHz. The 4312's lack of distortion is equally outstanding. Distortion is inaudible even at high power levels and at very low frequencies, as shown in the photo at right.

While specifications indicate that the 4312 has impressive performance characteristics, they cannot convey the full impact of an extended listening evaluation. Clean, crisp, wide-range performance, even at very loud levels, powerful bass fundamentals without doubling, and lifelike voice projection are qualities found in few loudspeaker systems, regardless of size or price. When heard from a monitor occupying less than 71 litres (2.5 ft³), the effect is little less than awesome.



Frequency response of the 4312 taken with ⅓-octave band pink noise. Measured at 1 m with a 1-watt input



This unretouched photo shows the acoustic output of the system when driven by a 50 W sine wave signal at 35 Hz. A laboratory microphone was used to pick up the sound from the 4312. The signal from the microphone was connected directly to an oscilloscope and the trace photographed.

Sustained performance at this intensity would not be encountered during normal use. A 50 W sine wave represents a far more difficult job for the loudspeaker than its rated capacity of 80 W program material, particularly in the very low frequency range. Even so, it can be seen that the 4312 produces an almost perfect sine wave.
(Note: Below 50 Hz, most loudspeaker systems produce substantial distortion with an input of only a few watts.)

4312 Studio Monitor

Specifications

Recommended Amplifier Power Range:	10-200 watts	
Crossover Frequencies	15 kHz, 6kHz	
Nominal Impedance	8 Ω	
High Frequency Dispersion	90° horizontal and vertical	
Frequency Response	45 Hz-15 kHz ± 3 dB	
Sensitivity[1]	91 dB, 1 W, 1 m (3.3 ft)	
	42 dB, 1 mW, 30 ft (9.1 m)	

Low Frequency Loudspeaker

Nominal Diameter	300 mm	12 in
Voice Coil	75 mm (3 in) edgewound copper ribbon	
Magnetic Assembly Weight	4.7 kg	10¼ lb
Flux Density	1.0 T (10,000 gauss)	
Sensitivity[2]	89 dB, 1 W, 1 m	

Midrange Loudspeaker

Nominal Diameter	130 mm	5 in
Voice Coil	22 mm (⅞ in) copper	
Magnetic Assembly Weight	0.74 kg	1⅝ lb
Flux Density	1.35 T (13,500 gauss)	
Sensitivity[3]	95 dB, 1 W, 1 m	

High Frequency Loudspeaker

Nominal Diameter	36 mm	1.4 in
Voice Coil	16mm (⅝ in) copper	
Magnetic Assembly Weight	0.74 kg	1⅝ lb
Flux Density	1.5 T (15,000 gauss)	
Sensitivity[4]	90 dB, 1 W, 1 m	
Finish	Textured gray or oiled walnut with black fabric grille	
Dimensions	597 mm x 362 mm x 298 mm deep	
	23½ in x 14¼ in x 11¾ in deep	
Net Weight	21 kg	45 lb
Shipping Weight	24 kg	52 lb

[1] Measured with the input swept from 500 Hz to 2.5 kHz, with controls set for flattest response. Note: Unlike many "theater type" loudspeaker systems that exhibit a rise in the midrange region, the 4312 is a true monitor providing substantially the same sensitivity through the full range of audible frequencies. Measures sensitivity below 500 Hz or above 2 kHz may be considerably greater than that of other systems with higher EIA sensitivity ratings.

[2] Since the major portion of the energy reproduced by the low frequency loudspeaker lies below 800 Hz, this specification has been developed using a test signal warbled from 100 Hz to 500 Hz, rather than the conventional 1 kHz sine wave test signal on which the EIA sensitivity is based.

[3] Averaged from 1 kHz to 3kHz, within 1 dB.

[4] Averaged above 2 kHz, within 1 dB.

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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