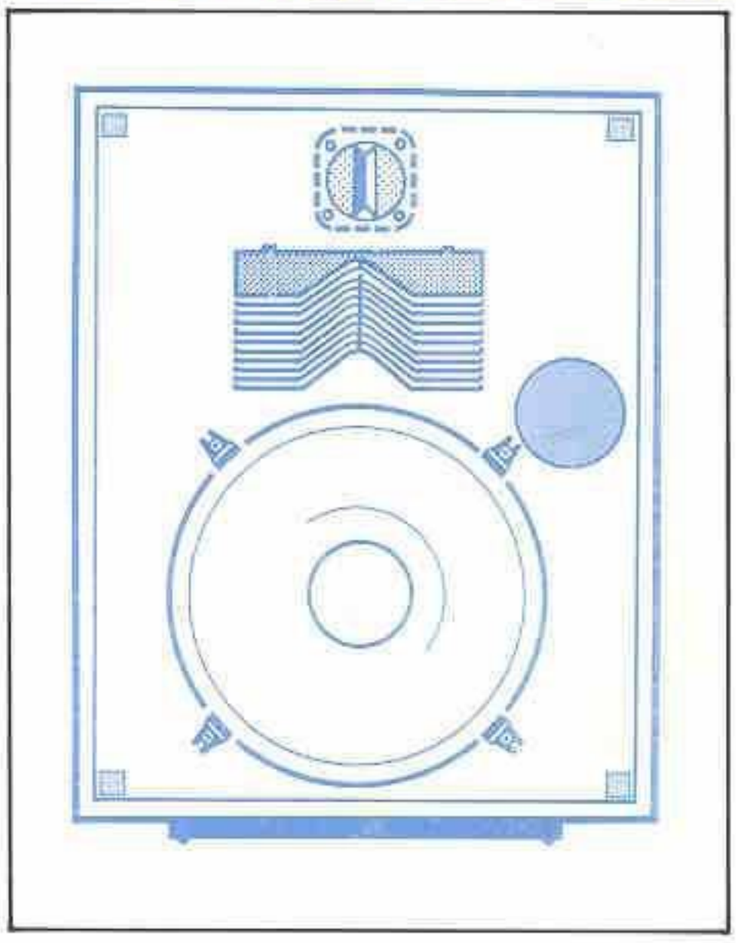
# Professional Series

## Three-Way Studio Monitors

### 4332 For Bi-Amplification
### 4333 With High Level Network



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

44 dB SPL at 30 feet with a 1-milliwatt input

101 dB SPL at 10 feet at one-half rated power input

Components: 15-inch low frequency loudspeaker, high frequency compression driver with horn/lens assembly and ultra-high frequency transducer

Balance controls located behind the removable grille

Oiled walnut or textured gray enclosure

## The 4332 and 4333 Studio Monitors

The 4332 and 4333 were conceived to fill the need for a moderately priced, wide bandwidth monitor loudspeaker system of very high quality. They are an expansion of the two-way system developed for the JBL 4330 and 4331 studio monitors, with the addition of an ultra-high frequency transducer which extends the bandwidth to 20,000 Hz.

The 4332/4333 consists of a newly developed 15-inch low frequency loudspeaker, wide range high frequency compression driver with a newly designed horn/lens assembly and an ultra-high frequency transducer. The 4333 is supplied with a high level, passive frequency dividing network for all transitions. The network design integrates the performance of the individual drivers, taking into account their location on the enclosure baffle panel and the acoustic effects of the enclosure itself. The 4332 is provided with a similar passive network for the high frequency and ultra-high frequency transitions and is fitted with input terminals for bi-amplification of the low frequency transition.

### Low Frequency Loudspeaker

Accurate, solid low frequency reproduction is provided by a 15-inch loudspeaker. The cone is selected for optimum stiffness, density and mass to provide the critical low frequency bandwidth and transient response required for monitor applications while maintaining high efficiency. Its 4-inch copper voice coil is manufactured of wire milled to a flat ribbon, then tightly wound on the narrow edge by hand. Edgewinding of the voice coil increases the amount of conductor in the magnetic field, resulting in greater transient response and efficiency. Closed construction and precise machining of the 13-pound magnetic assembly concentrates all the magnetic potential of the Alnico V magnet in the voice coil gap.

### High Frequency Compression Driver

Treble reproduction is provided by a wide range compression driver capable of high power output and linear response characteristics. Its 1.75-inch edgewound aluminum ribbon voice coil is suspended within a powerful magnetic field produced by a 10-pound magnetic assembly energized by an Alnico V magnet. The aluminum diaphragm is pneumatically formed of annodized aluminum foil. Output of the diaphragm is directed through the concentric channels of a phasing plug prior to final distribution by the horn/lens assembly.

### Horn/Lens Assembly

Controlled high frequency distribution is accomplished by an exponential horn and slant-plate acoustic lens. The cast construction of the horn provides rigidity to eliminate resonance. Its taper causes the waveform generated by the compression driver to expand at a controlled rate, providing the proper acoustic load on the driver diaphragm. The acoustic lens is analogous to a divergent optical lens, regulating the distance traveled by energy at various points along the wavefront. The precisely calculated hyperbolic curvature on the projecting surface of the lens determines its specific horizontal distribution pattern.

### Ultra-High Frequency Transducer

Overtones extending to 20,000 Hz are reproduced by a compression driver having an integral diffraction horn. The 1.75-inch edgewound aluminum ribbon voice coil is suspended within an intense magnetic field provided by a 3¾-pound magnetic assembly energized by an Alnico V magnet. The voice coil is bonded to a ring diaphragm pneumatically formed of aluminum alloy foil. The diffraction horn maintains a wide, controlled dispersion pattern, even at extremely high frequencies.

### Frequency Dividing Network

The 4333 is provided with a high level, passive frequency dividing network for both transitions of the system. The 4332 is equipped with a similar network for the ultra-high frequency transition only. In each case, the circuitry has been designed precisely for the various performance characteristics of the drivers and with consideration for their specific locations on the baffle surface. All components of the network are rated 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.

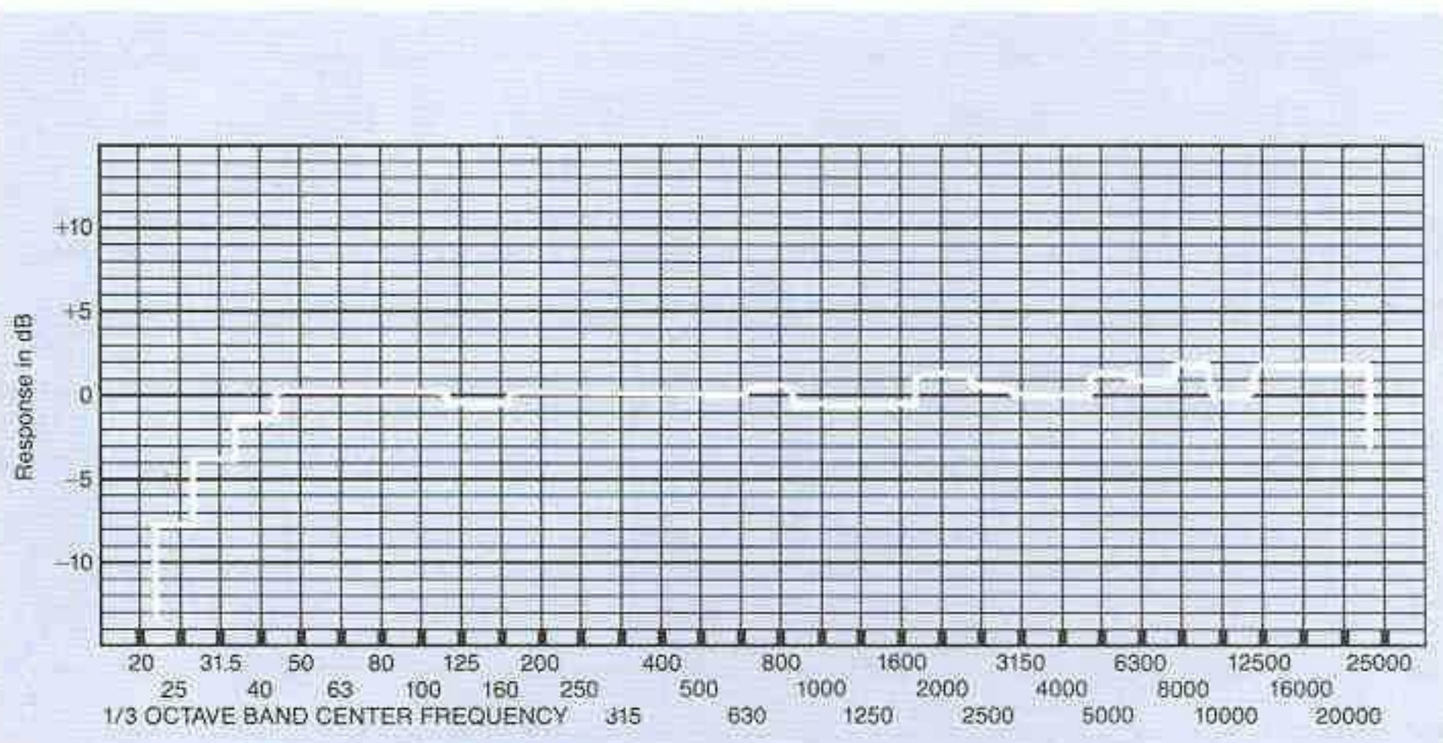
The 4332 is provided with input terminals for the two amplifiers of a bi-amplified installation. A special circuit card providing the precise crossover characteristics for the 4332 is available for use in the JBL 5231 or 5232 Electronic Frequency Dividing Network. Conventional electronic networks can be used, but they may not have the exact frequency and filter slope characteristics required for optimum system performance.

### 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 as much to performance as it does to the monitor's handsome appearance. The internal volume of the enclosure and physical configuration of the ducted ports are carefully designed to properly load the low frequency loudspeaker for optimum bass response and to control cone excursion, thus minimizing distortion and maximizing power handling capacity of the driver. To minimize resonance, the enclosure is constructed of dense ¾-inch stock with a 15-ply baffle panel; all joints are carefully lock mitered 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.

### 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 a non-reverberant 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.




Frequency response of the 4332 and 4333 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

| | | |
|---|---|---|
| Maximum Power Input[1] | | |
| 4332 | | |
| Below 800 Hz | 75 Watts steady state at 8 ohms | |
| Above 800 Hz | 30 Watts steady state at 8 ohms | |
| 4333 | 75 Watts steady state at 8 ohms | |
| Nominal Impedance | 8 ohms | |
| Power Output[2] | 101 dB SPL measured at 10 ft. (3.0 m) in a room volume of 2000 cu. ft. (56.6 m³) with ½ rated power input (−3 dB) | |
| Frequency Response | | |
| Sine Wave, On-Axis | 35 to 20,000 Hz, ±3 dB | |
| 1/3-Octave Band (500 Hz Reference) | −4 dB at 31.5 Hz,<br>−0.5 dB at 1 kHz,<br>+2 dB at 20 kHz | |
| Polar Response | No less than −3 dB at 60° horizontal and 30° vertical to 16 kHz | |
| Sensitivity[3] | 83.5 dB SPL measured at 10 ft. (3.0 m) with 1-Watt input averaged from 100 to 1000 Hz<br>44 dB SPL measured at 30 ft. (9.1 m) with 1-milliwatt input averaged from 100 to 1000 Hz | |
| Distortion | | |
| 1/2 Power, 99 dB SPL/10 ft. (3.0 m), Single Frequency | 1% or less third harmonic generation from 35 to 800 Hz<br>2% or less third harmonic generation above 800 Hz | |
| Crossover Frequencies[4] | 800 Hz and 8500 Hz | |
| Finish | Textured gray or oiled walnut | |
| Grille | Black fabric with the gray finish;<br>Dark Blue fabric with walnut | |
| Enclosure Volume | 4.5 cu. ft. | 127 liters |
| Enclosure Dimensions | 30¾" x 23¾" x 20¼" deep | |
| | 78 x 60 x 51 cm deep | |
| Net Weight | | |
| 4332 | 100 lbs | 45 kg |
| 4333 | 104 lbs | 47 kg |
| Shipping Weight | | |
| 4332 | 117 lbs | 53 kg |
| 4333 | 121 lbs | 55 kg |
| Accessories | 5231 Electronic Frequency Dividing Network, single channel<br>5232 Electronic Frequency Dividing Network, dual channel<br>52-5130 Crossover Card, required for the low frequency transition of the 4332. | |

**Caution**
Sound pressure levels produced by the 4332 or 4333 may cause permanent hearing loss. The suggested maximum exposure is 115 dBA for no more than 15 minutes. (Department of Labor Bulletin #334)

[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 4332 and 4333 provide 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 EIA Sensitivity ratings.
[4] The 52-5130 crossover card installed in a JBL electronic frequency dividing network will provide the appropriate crossover characteristics for the 4332. If another electronic network is used, a 12-dB/Octave filter slope will provide the closest approximation of the 42-5130.