

JBL

Low Frequency Systems

B460
B380
BX63



The Missing Octave

Without a doubt, some of the most dramatic moments in music involve the lowest audio frequencies. The lowest notes of a pipe organ, a bass drum, an electric bass, or a synthesizer can stir your soul—and shake your seat. Hearing such music is a big part of what makes a live performance so special.

Most of the seat-shaking music lies in the octave from 25 Hz to 50 Hz. (For instance, an open E on a bass guitar is about 41 Hz.) Today's record mastering technology has progressed to such a degree that even many mass pressings contain much of this low bass information. Audiophile-quality albums—typically direct-to-disc, half-speed mastered, or digitally recorded—contain truly impressive deep bass. And the new compact digital disc has the potential to surpass them all, because the CD requires no low frequency filtering whatsoever.

Yet, recording technology aside, the octave between 25 Hz and 50 Hz is missing on most stereo systems. Few full-range loudspeaker systems can reproduce much of this octave. Even well-designed systems must compromise for size considerations, and those few that do reach the bottom octave generally cannot reproduce it at anything approaching live performance levels.

But a JBL B460 or B380 low frequency system can reproduce the 25 Hz to 50 Hz octave and can do so at levels in excess of 110 dB. For the first time, you can feel the true power of a pipe organ, get the full impact of bass guitar and drums.

A JBL B460 or B380 will make any good stereo system much better. It will restore that missing octave and put the drama back into the music.

Better Midrange, Too

Better bass is only the most obvious benefit of a JBL low frequency system. A second immediately audible advantage is greater midrange clarity. In most full-range systems, the low frequency driver is also called upon to reproduce substantial amounts of mid frequency information; typical crossover points are in the 1500 to 2500 Hz region, or as much as two to three octaves above middle C. The long cone excursions required to produce 50 or 60 Hz notes tend to modulate the higher frequencies, causing some degradation of the midrange sound. A JBL B460 or B380 frees the bass driver of the full-range system from the responsibility for the lowest notes, eliminating the long excursions and attendant intermodulation distortion. The main amplifier is also freed from the responsibility for the lowest notes and similarly benefits in terms of lower IM. Midrange sound will be notably cleaner.

Why the B460 and B380 Are the Best Low Frequency Loudspeakers You Can Buy

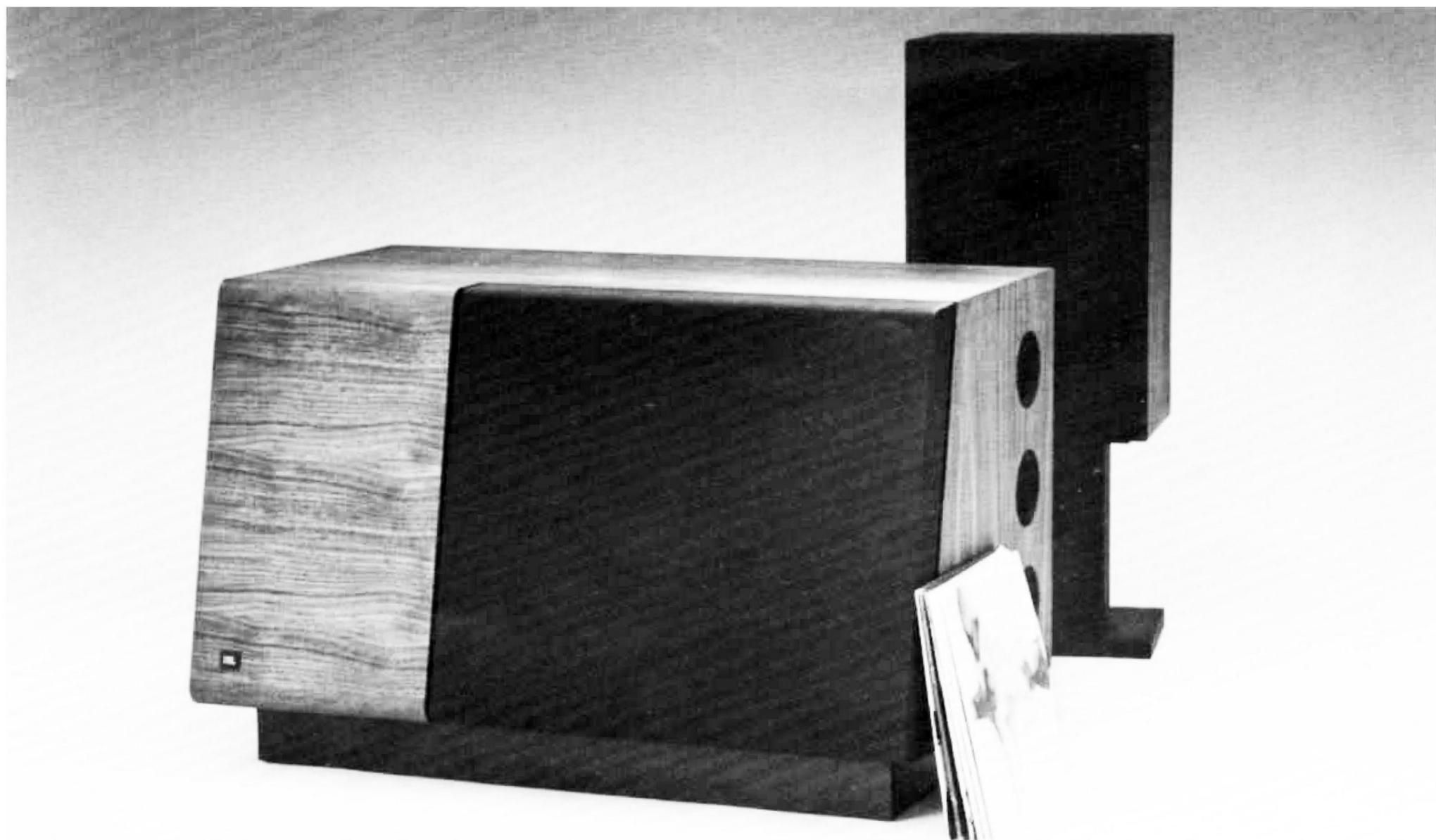
The B460 and B380 were developed from JBL's long experience in designing drivers for demanding professional applications, in which very high sound pressure levels at very low frequencies are a requirement. (In fact, JBL drivers were likely used by the musicians to produce those seat-shaking low notes in the first place.) JBL's 18- and 15-inch drivers offer unsurpassed performance in terms of high power capability, low distortion, and excellent transient response.

The B460 uses the JBL Model 2245H 18-inch (460 mm) driver, mounted in a vented enclosure of 8 cubic feet (226 liters). The combination is a third-order quasi-Butterworth alignment. The enclosure is tuned to 26 Hz.

The 2245H loudspeaker was developed originally for custom studio monitor and other high-power applications, such as motion picture sound effects. It incorporates a die-cast aluminum frame, integrally stiffened cone with foam surround, an edgewound voice coil 4 inches in diameter and nearly 1 inch long, and an individually machined magnetic pole piece and back plate. Additionally, the cone is coated with Aquaplas, an exclusive damping formulation that ensures optimum mass and density.



B460



The driver also features a large (20 lb), high flux, Symmetrical Field Geometry (SFG) magnetic structure that significantly reduces second harmonic distortion. Suspension characteristics are matched to the coil and gap dimensions so that the suspension is linear while the coil is within the linear range of its travel. When the coil travel becomes nonlinear, the suspension becomes stiffer to retain control of cone travel. Free-air resonance of the driver is 20 Hz.

The 2245 H produces bass that is both powerful and accurate. Reactive acoustical energy storage in the ported enclosure augments the cone's output so that cone excursion is minimal—keeping distortion very low. In a typical listening environment, the B460 can generate sound pressure levels of 110 to 115 dB. It has the power to recreate earthquakes and cannon shots, but it will also reproduce the full harmonic textures of a contrabassoon or the subtlety of softly played tympani.

The smaller B380 offers substantially the same performance, with the only difference being that its maximum power rating is 600 watts rather than the 800 watts of the B460, so it cannot produce quite the same volume levels in larger rooms.

The driver of the B380 is the JBL Model

2235H, a 15-inch (380 mm) loudspeaker also designed for high-power monitor applications. The driver is mounted in a ported enclosure of $4\frac{1}{2}$ cubic feet (127 liters). Enclosure tuning and system alignment are identical to the B460. The enclosure may be placed upright or on its side. In either case, a separate platform base raises the B380 slightly off the floor.

The 2235H driver is similar in design and construction to the 2245H. The voice coil is 4 inches in diameter and $\frac{3}{4}$ inch deep; magnetic assembly weight is $18\frac{5}{8}$ lb.

Enclosure construction in both models is of heavily braced, dense particle board. Finish veneers are American black walnut, oiled and hand rubbed. The B460 is also available by special order in several custom finishes: oiled white oak, quarter sawn; oiled Brazilian rosewood; lacquered macassar ebony; and black stain. A choice of grille colors—black, blue, brown, maroon, rust, or tan—is available with a custom finish.

JBL BX63 Electronic Dividing/Summing Network

Use of either the B460 or B380 requires an external frequency dividing network, and the JBL BX63 will allow either system to achieve its full potential. The response of the BX63 has been specified by computer for the B460 and B380, to achieve a quasi-fifth order alignment. This maximizes low frequency extension and flatness while minimizing excessive cone motion. Any other

network considered for use with either system should exactly duplicate this response curve. (A graph of this voltage drive is in the Specifications section.)

Beyond its unique suitability as a dividing network for the B460 and B380, the BX63 provides a balanced differential drive that bridges a dual-channel power amplifier. Either system requires a minimum of 200 watts, and single-channel amplifiers capable of such outputs are both uncommon and expensive. But a bridged dual-channel amplifier will produce a peak power output of about four times its per-channel stereo rating, so that a 50-watt per channel stereo amplifier can produce as much as 200 watts in a bridged mode. There are a number of excellent dual-channel amplifiers rated in the 50 to 250-watt-per-channel range, and almost all of them can be successfully (and easily) bridged through use of the BX63.

In addition to providing bridging capability, the active low pass circuitry provides gain variable over a wide range to match a variety of amplifiers and program material.

For the high-pass section, only the highest quality passive components are used, avoiding the possibility of any added coloration.

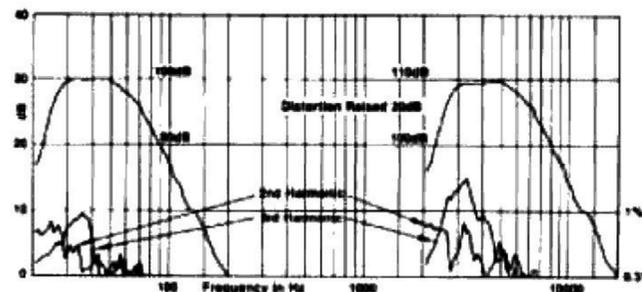
Specifications

	B460	B380
Minimum Recommended Amplifier Power	200 watts continuous sine wave	200 watts continuous sine wave
Maximum Recommended Amplifier Power	800 watts continuous sine wave	600 watts continuous sine wave
Nominal Impedance	8 ohms	8 ohms
Crossover frequency	63 Hz (external crossover)	63 Hz (external crossover)
Sensitivity	94 dB SPL, 1 W @ 1 m (3.3 ft)	90 dB SPL, 1 W @ 1 m (3.3 ft)
Harmonic Distortion	See graph	See graph
Driver Diameter	18 in (460 mm)	15 in (380 mm)
Voice Coil	4 in (100 mm) edgewound copper	4 in (100 mm) edgewound copper
Flux Density	1.22 T (12,200 gauss)	1.2 T (12,000 gauss)
Magnetic Assembly Weight	20 lb (9.1 kg)	18 ⁵ / ₈ lb (8.5 kg)
System Dimensions	24 ¹³ / ₁₆ in x 38 ⁵ / ₁₆ in x 24 ¹ / ₄ in D 631 mm x 974 mm x 616 mm D	20 ³ / ₄ in x 27 ¹ / ₂ in x 17 in D (19 ³ / ₈ in D w/grille) 527 mm x 699 mm x 432 mm D (492 mm D w/grille) Base adds 1 ¹ / ₄ in (32 mm) to height
Shipping Weight	125 ¹ / ₂ lb (57 kg)	70 lb (32 kg)

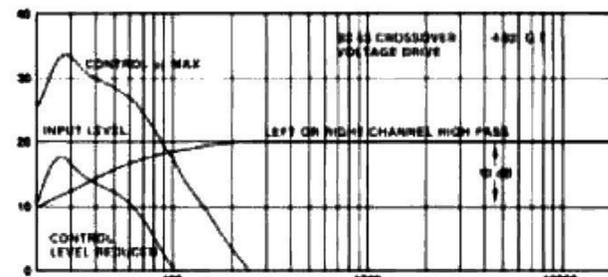
Bass	BX63
Maximum Output	18 dBV (10 k Ω output load)
Hum and Noise	-95 dBV (20 Hz-20 kHz equivalent bandwidth, gain control at "5")
THD	0.01% (0 dB input level)
Intermodulation Distortion (SMPTE)	0.01% (0 dB input level)
Level Control Range	+12, -80 dB
Input Summing Contribution	0.35 dB
Differential Output Balance	0.35 dB
Output Impedance	180 Ω
Power-On Transient Settling	0.1 s

Stereo	
Separation	95 dB
Blocking Capacitance	0.22 μ F \pm 5%
Impedance Accommodation	
Low	9-18 k Ω
Mid	18-36 k Ω
High	36 k Ω - ∞ Ω

General	
Crossover Frequency	63 Hz
Power Requirements	120 VAC, 50/60 Hz
Power Consumption	2 W
Dimensions	5 ¹ / ₂ in W x 7 ¹ / ₂ in D x 1 ⁷ / ₈ in H 140 mm x 190 mm x 48 mm



Frequency response vs. distortion, B460 with BX63 dividing network.



Voltage drive, BX63 frequency dividing network.



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