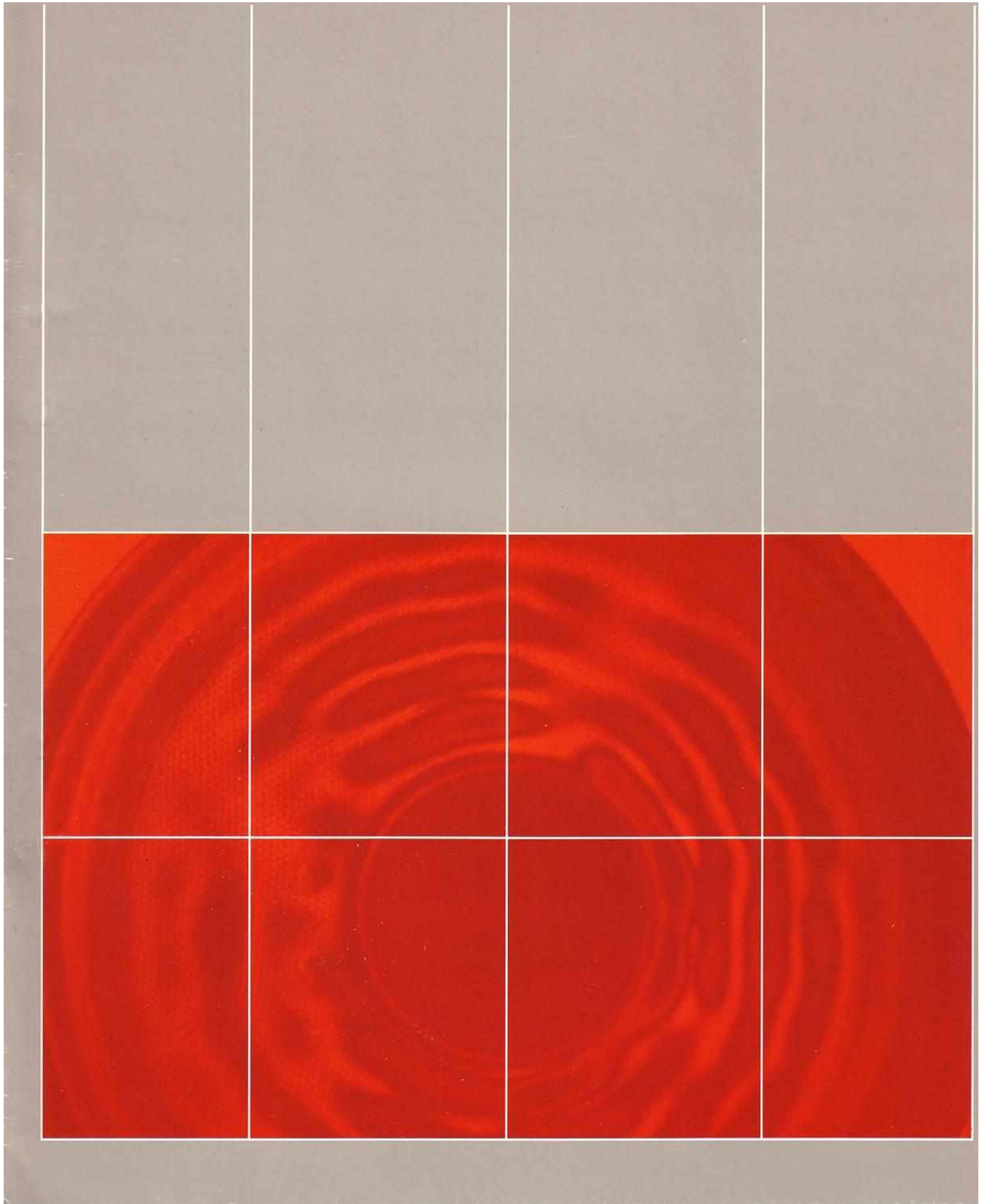




Loudspeaker Systems



If one word were used to summarize JBL and its loudspeaker products, that word would be "quality." From the day James B. Lansing founded the company 35 years ago, JBL has been uniquely capable of designing and manufacturing the highest quality loudspeakers for home and professional use.

James B. Lansing was a creative engineer who had been instrumental in developing the first high efficiency, high fidelity loudspeakers for movie theaters. Many of Lansing's basic designs were so advanced that they are still in use today, modified only by advances in materials and continuing to outperform other designs.

Lansing invented his own tooling to manufacture his designs. Manufacturing innovation remains a JBL tradition; we continue to design and build much of our own tooling. Our designs are so specialized that there's no other way to achieve the manufacturing quality we desire. Without this custom tooling, it is impossible to build a loudspeaker of JBL quality.

This quality has made JBL the number one choice

of audio professionals. These people — recording studio engineers, musicians, concert sound contractors— depend on their loudspeakers and demand both great performance and absolute reliability. That's why you'll hear JBL speakers at concerts, why you'll find JBL speakers in the top recording studios.

Our professional experience helps us build our home loudspeakers. Because we help produce the music, we know more about reproducing it. Our professional and home systems are designed and manufactured side-by-side to the same exacting standards. Every JBL loudspeaker is part of the same 35-year tradition of high quality.

Every JBL product is also the result of thorough engineering effort, combined with exceptional care and precision in manufacture. Through these

efforts, we've developed general design practices that contribute to our traditional high performance levels. Examples include the large magnets and voice coils that make our loudspeakers more efficient and help power capacity. Our machining tolerances are held to within 0.0005 mm — tolerances considered impossible by most of the industry. We custom design our components for each application, rather than follow the usual practice of using off-the-shelf stock items.

In every instance, all of our design and manufacturing abilities follow our primary design philosophy: to build the most accurate loudspeakers possible. This philosophy is not unique to JBL, of course, but our definition of accuracy is.

The Many Facets of Accuracy. At JBL, ac-

curacy is more than flat frequency response. Accuracy is also wide dynamic capability, the range of loudness levels a speaker can produce. Accuracy is low distortion. And accuracy is reliability.

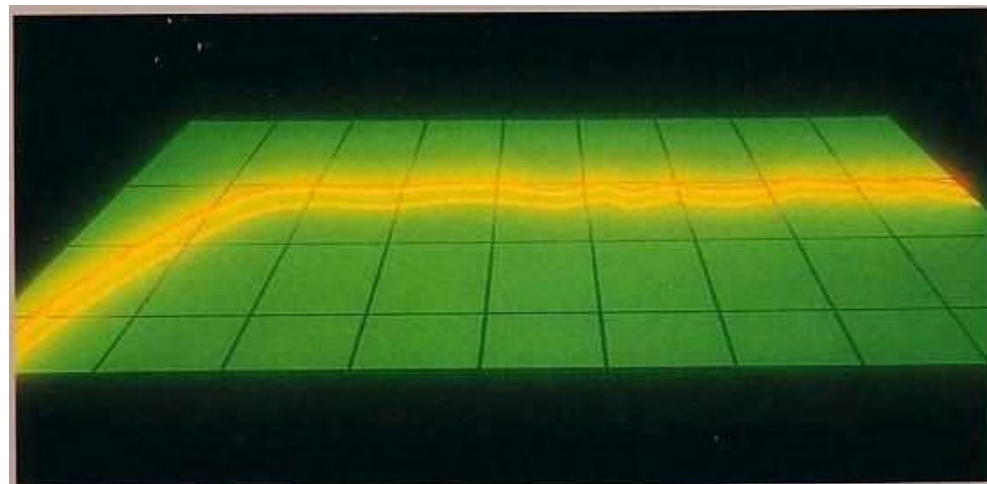
Flat Frequency Response. Flat frequency response is an important attribute. We design all our loudspeakers for the flattest possible response over the widest possible bandwidth. You're assured of hearing all the music with no undue emphasis on any part of it. Most manufacturers strive for flat frequency response. A few (like JBL) achieve it. But only JBL carries the concept of accuracy to cover the other attribute necessary to perfect reproduction of the original performance.

Dynamic Capabilities Wide dynamic capability is every bit as important to the ultimate accuracy of a loudspeaker. Technically, dynamic range in a loudspeaker is the difference between the lowest audible level a speaker can produce and the highest volume level it can reach before distorting. Wide dynamics are essential in reproducing the full range of volume levels of live music. Dynamic range is function of both efficiency



On the cover:

By allowing detailed analysis of how a speaker cone behaves under stress, laser holography helps in evaluating materials



JBL Product Design Philosophy

and power capacity. When high efficiency and high power capacity are combined, the result is the wide dynamic capability of JBL speakers.

JBL speakers are unique in combining wide dynamics with flat frequency response. Unlike most systems, JBL's frequency response is just as flat at high power inputs as at low. Many loudspeakers exhibit a phenomenon known as compression: when input power is increased, the output level does not increase at the same rate across the speaker's bandwidth. This occurs most often at high frequencies. Tweeters not designed to handle high

power levels exhibit a narrowing bandwidth even as their overall output increases. JBL speakers are unequalled in producing accurate sound at high volume levels.

Low Distortion. Low distortion is also part of the overall accuracy of a loudspeaker. Ideally, the speaker should reproduce the audio signal without

adding (or subtracting) anything of its own. Most loudspeakers fall far short of this ideal, producing large amounts of distortion. They are by far the weakest link in the audio chain.

But JBL loudspeakers are different. Our systems have always been known for low distortion; hence, their long-standing popularity with audio professionals. Today's JBL speakers benefit from several recent breakthroughs by our engineers, innovations that bring our distortion down to levels comparable to those of electronic components. Such low distortion levels make it worthwhile to use the very best electronics.

Reliability. How is reliability related to accuracy? A speaker that isn't functioning is the most inaccurate of all. Rugged, reliable construction is the JBL tradition. JBL speakers are built to last, built to handle

continuous daily use (and abuse) without strain. Many of the loudspeakers manufactured in the first years of the company are still in use today, still delivering all the performance designed into them.

Wide dynamic capability. Flat frequency response. Low distortion. High reliability. They all add up to the JBL loudspeaker — the best investment you can make in your sound system.

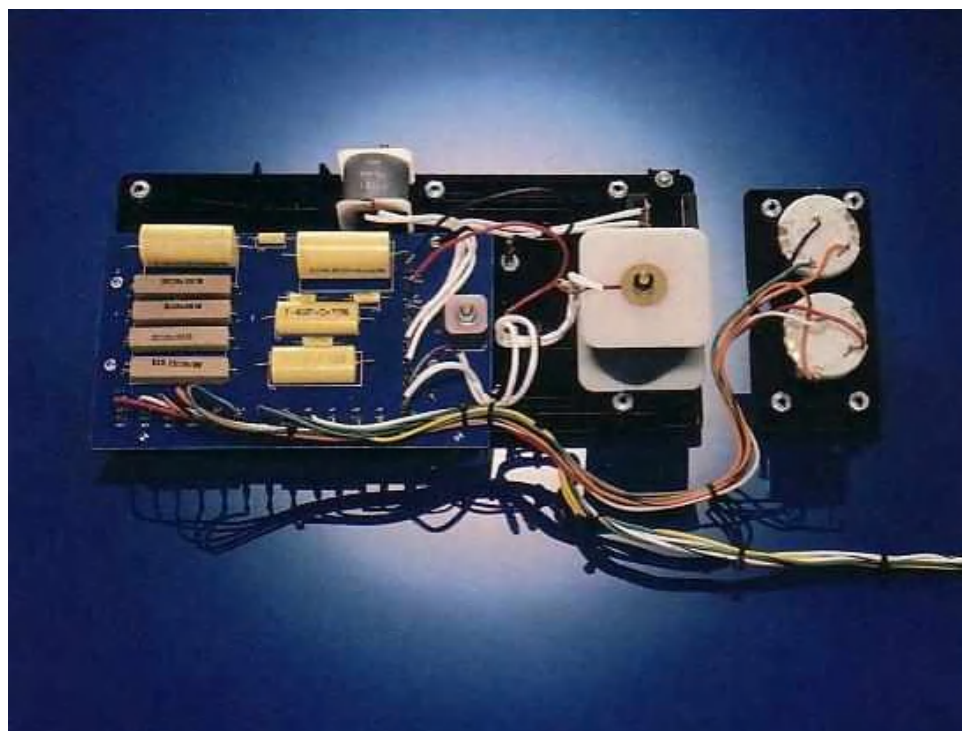
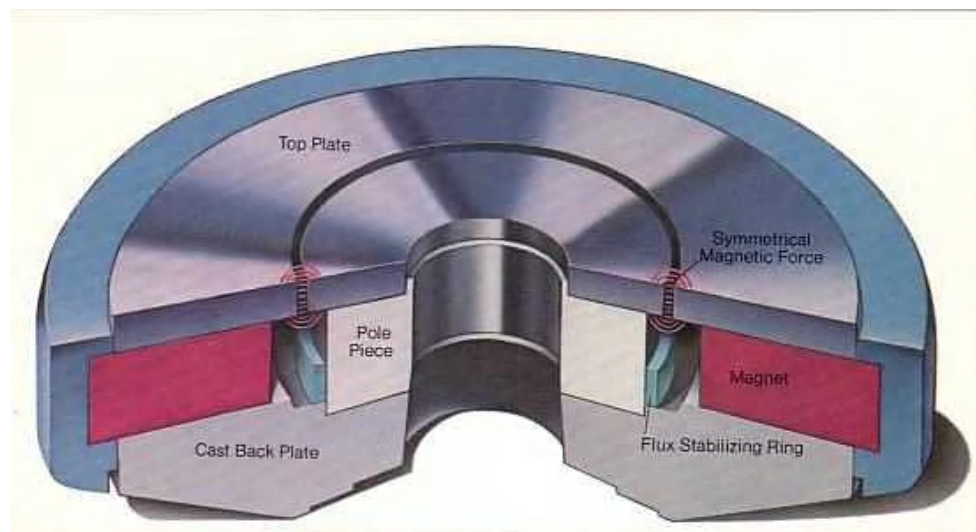
L-Series Technical Notes

Symmetrical Field Geometry. All of the low frequency drivers of the L Series loudspeakers incorporate JBL's unique SFG (Symmetrical Field Geometry) magnetic structures. There are two innovations in the SFG design. One is the symmetrical magnetic field around the voice coil gap, which reduces second harmonic

distortion below 100 Hz. Conventional designs have an asymmetrical field around the gap, so that the interaction of the field and the voice coil is non linear.

The second SFG innovation is the Flux Stabilizing Ring encircling the pole piece. This reduces the second harmonic distortion above 100 Hz. Because the low frequency drivers of JBL loudspeakers have bandwidths extending well above 100 Hz. SFG results in both cleaner bass and cleaner midrange.

High Resolution Dividing Network. Most dividing networks blur musical transients because the large capacitors necessary for high power handling introduce a slight time lag between the input and output signal. (This is called hysteresis.) To improve transient resolution, JBL engineers incorporated circuitry more typical of active high frequency electronics. Small, highly linear "bypass" capacitors, wired in parallel with the larger capacitors, enable the network to pass transient waveforms unaltered. These high resolution frequency dividing networks are found in all JBL L Series loudspeaker systems.



L250

The L250 is the most advanced loudspeaker JBL has ever built for the home. From the shape of the enclosure to the design of the level controls, JBL has spared no effort, overlooked no performance factor necessary to building the most accurate loudspeaker possible.

The L250 will sound as good as your other equipment will allow. Frequency response is nearly ruler-flat over the whole audible bandwidth. Distortion is held to levels more typical of fine electronics than of loudspeakers. JBL engineers paid particular attention to stereo imaging, so that it is precise, stable, and three-dimensional.

Form follows function in the L250's enclosure. The asymmetrical shape minimizes diffraction effects, as do the rounded edges. The sloping front baffle puts the drivers in correct time and phase relationship as well. To further assure a stable image, the L250s are designed in mirror-imaged pairs.

An advanced, highly refined version of JBL's high resolution dividing network contributes greatly



Floor-Standing Systems



to the excellent performance. The network is a first-order design with 6 dB per octave slopes for the smoothest blending of the drivers. Conjugate circuits level the impedance of each driver, so that actual operation approaches the theoretical ideal.

Instead of conventional level controls, the L250 uses fixed-value, stepped attenuators to give the performance advantages of hard wire while still allowing level adjustments, which are made via high-current bus bars.

The L250 is finished in oiled walnut veneer. Four other finishes are available by special order: transparent black stain; Indian rosewood; Macassar ebony; and white oak. There is a choice of six grille colors: brown, blue, black, rust, tan, and maroon.

Floor-Standing Systems

LI 50A

The three-way LI 50A was developed from the technology of the L112. JBL's state-of-the-art compact system. The floor-standing design offers a number of advantages; most immediately apparent is the bass performance. The L150A has a 300 mm (12 in) low frequency loudspeaker and a passive radiator of the same diameter to give it true deep bass performance.

Another audible advantage of the floor-standing design is the placement of the midrange and high frequency drivers at the approximate ear level of



the listener. Such placement aids in the perception of the sound as being "live" rather than recorded.

The central concept of the LI 50A design is the use of drivers that operate effectively well beyond the ranges required of them in the system. This allows the use of a frequency dividing network with optimum slopes for the smoothest blending of the drivers' outputs. Additionally, the network is JBL's high resolution design and improves the system's transient response. The drive are mounted in an in-line array for the best imaging.

The L150A is finished in oiled walnut. It is also available in the same custom finishes as the L250: transparent black stain; Indian rosewood; Macassar ebony; and white oak. Grille colors available are brown, blue, black, rust, tan, and maroon.

Three-Way Systems

The highly acclaimed L96 and L112, as well as the new L86, are our most advanced compact speaker systems, synthesizing technological expertise with musical understanding and traditional JBL craftsmanship for smooth, accurate natural sound. Their powerful woofers, increased power handling capability, wide frequency response, and full dynamic range make these systems ideal for realizing the full potential of the latest recordings.

JBL's newest system, the L86, utilizes a 200 mm (8 in) bass driver with a die-cast frame and SFG magnetic structure. The 75 mm (3 in) low frequency driver of the L96 and the 300 mm (12 in) bass driver of the L112 provide even deeper bass. Powerful magnets and large voice coils give the drivers high power handling capability, outstanding transient response and further reduction of distortion. The thick white coating on the cones is an exclusive JBL formulation that gives them the optimum mass and stiffness for flattest frequency response.

The high frequency dome radiators used in all three systems have the uncanny ability to reproduce even the highest harmonics with depth. Yet they cleanly handle the loudest musical peaks with authority. Formed of a lightweight phenolic material, the domes possess the optimum combination of strength, mass, and rigidity.

One of the theoretical advantages of a three-way system over a two-way design is an increased dynamic capability. Music contains much more

energy in the middle frequencies than in the treble or bass, and the separate midrange driver of a three-way system helps reproduce these peaks without strain or distortion. The design advantage is fully realized in the JBL three-way systems. The robust 130 mm (5 in) driver has enough reserve dynamic headroom to handle the highest program peaks. Proven in studio monitor loudspeakers, the midrange driver also offers very smooth low-distortion response.

Specially designed frequency dividing networks give the L86, L96, and L112 superior transient response, so that music retains the full clarity and total impact of the original source. The networks are mounted on heavy duty printed circuit boards to assure reliability.

The L86 and L96 drivers are positioned in an inline array, for optimum stereo imaging. The L112 achieves its superb imaging through a symmetrical baffle design, so that the right and left channel speakers are mirror-imaged. For maximum strength and resistance to vibration, the enclosure panels are cut from dense 19 mm (¾ in) compressed wood. American black walnut veneer, oiled and hand-rubbed, completes the enclosure finish.



L96



L86



L112



Two-Way Systems

Our compact two-way systems, the LI 5, L46, and L56, offer an uncanny degree of focus and transparency, very stable imaging, wide bandwidth, and a dynamic capability that is truly impressive.

The size of the LI 5 allows for easy placement in any home or office; just a few inches larger, the L46 and L56 are also extremely adaptable.

Much of the technology used to build our renowned larger speakers has been incorporated into the LI 5, L46, and L56, enabling these smaller systems to provide very accurate musical reproduction. The woofers all feature die-cast frames and JBL's unique SFG (Symmetrical Field Geometry) magnetic structure, an engineering breakthrough that reduces second harmonic distortion to levels dramatically below those of conventional designs. The SFG structure reduces this distortion over the driver's whole bandwidth, so you hear the improvement as both purer midrange and clearer, tighter bass. The woofer cone is coated with Aquaplas, an exclusive formulation which creates a



laminated construction with ideal damping characteristics. A ducted port tunes the systems to proper response, improving low frequency power handling. The LI 5 is equipped with a 162 mm (6V2) woofer; the L46 has a more powerful 200 mm (8 in) woofer; and the L56 has a 250 mm (10 in) woofer for even better bass response.

All the systems share the same dome radiator for reproduction of the upper midrange and high frequencies. Another product of our advanced research methods, the dome offers very smooth, extended response. Dispersion is excellent, as is transient response (the driver's ability to respond accurately to dynamics such as the initial onset of a musical note).

JBL's unique high resolution dividing networks take full advantage of the inherently excellent transient response of the LI 5, L46, and L56 drivers. The network makes use of polypropylene bypass capacitors for better resolution of complex transient waveforms, and therefore clearer, more accurate sound.

The enclosures are constructed from dense, 19 mm (3/4 in) compressed wood, a material acoustically superior to solid wood. A fiberglass lining damps unwanted internal acoustical reflections. The LI 5, L46, and L56 are finished in oiled American black walnut veneer, hand-rubbed to bring out the natural grain structure of the wood.

Subwoofer

The B460 subwoofer system adds the ultimate in low frequency performance to any good stereo system. Today's best program sources, such as digital tapes, often contain substantial information below 50 Hz; the B460 gives a system the capability to reproduce that information with exceptional realism, and at high sound pressure levels. (Even the best full-range systems usually cannot generate really high SPL at the lowest frequencies.)

Besides adding bass, the B460 offers another advantage. When the full range speakers reproduce very low frequencies, the bass excursions tend to adulterate the higher frequencies. Relieved of the responsibility for the low bass by the B460, the full range speakers will produce cleaner sound in the midbass and lower midrange.

The driver of the B460 is 460 mm (18 in) in diameter and is widely used in custom studio monitors and other professional applications. The driver incorporates a die-cast aluminum frame, integrally stiffened cone with foam surround, and a



B460



BX63



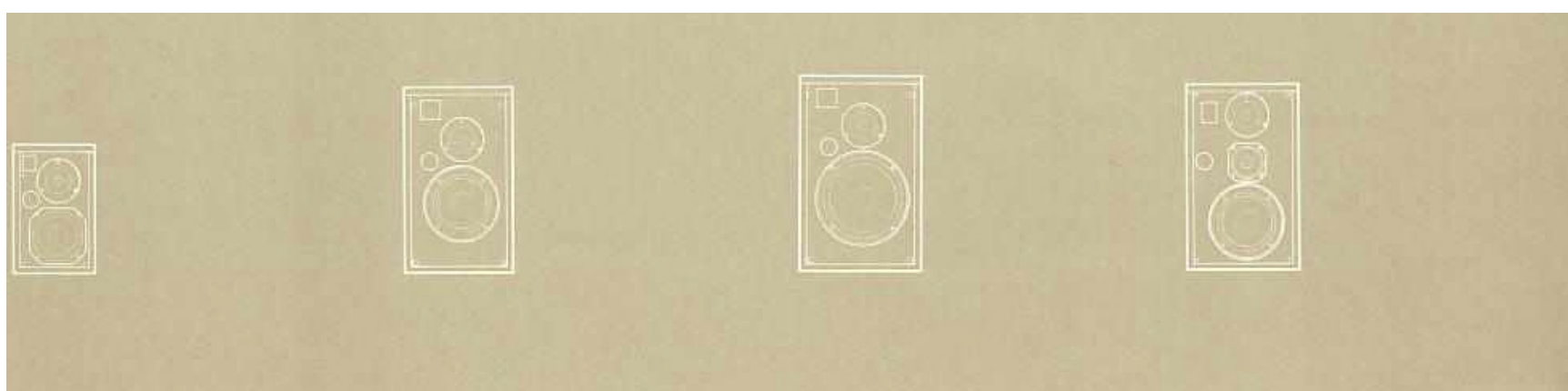
100 mm (4 in) diameter edgewound copper ribbon voice coil. The SFG magnetic structure reduces distortion, and carefully engineered suspension elements allow maximum excursion linearity with complete freedom from dynamic instabilities.

The B460 is finished in oiled walnut veneer. Four other finishes are available by special order: transparent black stain; Indian rosewood; Macassar ebony; and white oak. There is a choice of six grille colors: brown, blue, black, rust, tan, and maroon.

The BX63 dividing network is designed to work in combination with the B460. The network has active low-pass circuitry and is designed to bridge a stereo amplifier into the mono mode so that it can drive the B460 with quadrupled output power. The stereo high-pass circuitry of the network is passive for the lowest possible distortion. Crossover frequency is 63 Hz.

System	L15	L46	L56	L86
Maximum Recommended Amplifier Power	100 watts per channel	100 watts per channel	150 watts per channel	200 watts per channel
Nominal Impedance	8 ohms	8 ohms	8 ohms	8 ohms
Crossover Frequencies	2,5 kHz	3 kHz	2.2 kHz	800 Hz, 3.7 kHz
System Sensitivity*	87 dB SPL	88 dB SPL	90 dB SPL	88 dB SPL
Low Frequency Loudspeaker				
Nominal Diameter	162 mm (6V2 in)	200 mm (8 in)	250 mm (10 in)	200 mm (8 in)
Voice Coil	38 mm (IV2 in) copper	38 mm (IV2 in) copper	38 mm (1V2 in) copper	38 mm (1V2 in) copper
Magnetic Assembly Weight	1.3 kg (3 lb)	1.3 kg (31b)	1.3 kg (3 lb)	1.3 kg (3 lb)
Lower Midrange Loudspeaker				
Nominal Diameter	—	—	—	—
Voice Coil	—	—S	—	—
Magnetic Assembly Weight				
Midrange Loudspeaker				
Nominal Diameter	—	—	—	130 mm (5 in)
Voice Coil	—	—	—	22 mm (7/s in) copper
Magnetic Assembly Weight				0.74 kg (1 5/a lb)
High Frequency Dome Radiator				
Nominal Diameter	25 mm (1 in)	25 mm (1 in)	25 mm (1 in)	25 mm (1 in)
Voice Coil	25 mm (1 in) copper	25 mm (1 in) copper	25 mm (1 in) copper	25 mm (1 in) copper
Magnetic Assembly Weight	0.68 kg (1V ₂ lb)	0.68 kg (1V2 lb)	0.68 kg (IV2 lb)	0.68 kg (IV2 lb)
General				
Dimensions	375 mm x 238 mm x 183 mm D 14 ³ / _A in x 9 ⁹ / ₁₆ in x 7 ³ / ₁₆ in D	527 mm x 317 mm x 267 mm D 20 ⁷ / ₁₆ in x 12 ¹ / ₂ in x 10 ¹ / ₂ in D	565 mm x 356 mm x 298 mm D 22 ¹ / ₄ in x 14 in x 11 ³ / ₄ in D	543 mm x 330 mm x 254 mm D 21 ³ / ₈ in x 13 in x 10 in D
Shipping Weight	16 kg (35 lb) (per pair)	13 kg (29 lb)	20 kg (44 lb)	16 kg (35 lb)

*Sensitivity measured with a 2.83 V input at a distance of 1 m (3.3 ft). 2.83 V is equivalent to 1 watt into an 8 ohm load.



Specifications

L96
250 watts
per channel

8 ohms

1.1 kHz, 3.7 kHz

89 dB SPL

L112
300 watts
per channel

8 ohms

1.1 kHz, 3.7 kHz

89 dB SPL

L150A
300 watts
per channel

8 ohms

1.1 kHz, 3.7 kHz

89 dB SPL

L250
400 watts
per channel

8 ohms

400 Hz, 1.5 kHz,
5 kHz
90 dB SPL

B460
800 watts

8 ohms

63 Hz (external
crossover)
94 dB SPL

250 mm (10 in)
76 mm (3 in)
edgewound copper
4.7 kg (10V4 lb)

300 mm (12 in)
76 mm (3 in)
edgewound copper
4.7 kg (10¹/₄ lb)

300 mm (12 in)
76 mm (3 in)
edgewound copper
4.7 kg (10V4 lb)

360 mm (14 in)
100 mm (4 in)
edgewound copper
8.5 kg (18⁵/₈ lb)

460 mm (18 in)
100 mm (4 in)
edgewound copper
9.1 kg (20 lb)

200 mm (8 in)
50 mm (2 in)
copper
2.7 kg (6 lb)

130 mm (5 in)
22 mm (⁷/₈ in)
copper
0.74 kg (1⁵/₈ lb)

130 mm (5 in)
22 mm (⁷/₈ in)
copper
0.74 kg (1⁵/₈ lb)

130 mm (5 in)
22 mm (⁷/₈ in)
copper
0.74 kg (1⁵/₈ lb)

130 mm (5 in)
22 mm (⁷/₈ in)
edgewound copper
0.74 kg (1⁵/₈ lb)

25 mm (1 in)
25 mm (1 in)
copper
0.9 kg (2 lb)

25 mm (1 in)
25 mm (1 in)
copper
0.9 kg (2 lb)

25 mm (1 in)
25 mm (1 in)
copper
0.9 kg (2 lb)

25 mm (1 in)
25 mm (1 in)
copper
0.9 kg (2 lb)

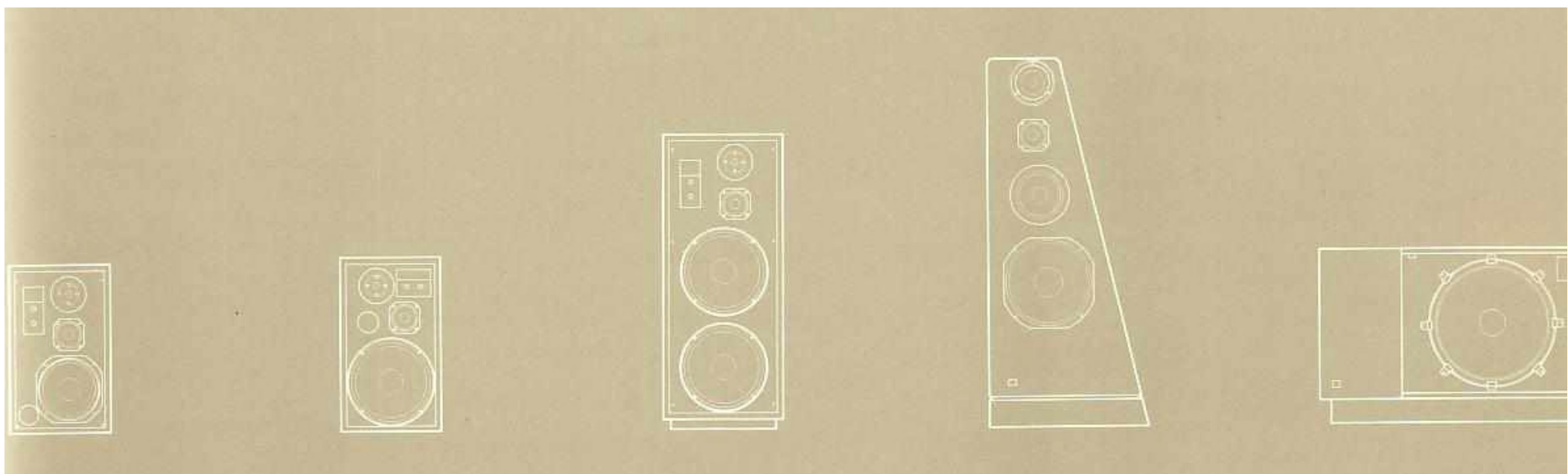
J mm x 362 mm x
298 mm D
23V₂ in x 14¹/₄ in x
11³/₄ in D
24 kg (52 lb)

622 mm x 362 mm x
333 mm D
24¹/₈ in x 14V₄ in x
13 in D
25.5 kg (56 lb)

1054 mm x 432 mm x
330 mm D
41V₂ in x 17 in x
13 in D
41 kg (90 lb)

1321 mm x 572 mm x
362 mm D
52 in x 22⁷/₈ in x
14¹/₈ in D
68 kg (150 lb)

631 mm x 974 mm >
616 mm D
24¹³/₁₆ in x 38⁵/₁₆ in
24V₄ in D
57 kg (125V₂ lb)



UBL

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JBL continually engages in research related to product environment. 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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JBL

WANT TO RELAX TO BEAUTIFUL
MUSIC

WELCOME

WE HAVE GOOD HIFI AT YOUR
SERVICE

PLEASE WAIT HERE & A MEMBER
OF OUR TEAM WILL BE WITH
YOU SHORTLY.

Or press finger HERE