JBL Loudspeaker Components

JBL loudspeaker systems represent the ultimate commitment in complete, ready-to-use sound reproduction equipment designed to meet specific performance goals. However, there will always be the serious listener who wants something more, and wants to personally adapt technology to a set of special requirements. The JBL Custom Component Series has been assembled for just such an individual, providing the technology, the components and the latitude to construct a loudspeaker system that can truly be called unique.

JBL has been developing loudspeaker systems for studio and home use since the earliest days of high fidelity. Long regarded as "the musician's loudspeaker," it is commonplace for professional musicians to choose JBL for their performance systems and for their homes. This worldwide reputation has evolved from JBL's unvarying commitment to quality. From concept to finished product, the objective has remained the same: to build the best-sounding, most reliable audio reproducers that art and technology can devise.

The true measure of JBL's achievement can be found in the most critical and demanding applications: theaters, stadiums, arenas and recording studios, or wherever exceptional performance is a professional requirement. Today an ever-increasing number of major recording studios are converting to JBL monitor loudspeakers. The clarity and definition of the recordings they produce is a direct reflection of the sound of JBL monitors.

To hear the result in the home as it is intended to be heard—indeed, as it was heard during each step of the recording process—requires loudspeakers of the same professional caliber as those used in the most modern recording studios.

Components

JBL research and development is responsible for a number of highly significant contributions to sound reproduction. Among these are the 4-inch voice coil, the acoustic lens, integrated stereo through radial diffraction, the ring radiator, the silver impedance-controlling ring and use of the passive radiator.

With minor exceptions for special applications, JBL voice coils are formed from an aluminum or copper wire drawn to a ribbon and hand wound on the narrow edge. The JBL voice coil is a marvel of ingenuity: it weighs but a fraction of an ounce, yet it must be absolutely round and remain dimensionally stable at all times. JBL makes and uses the largest voice coils in the industry.

Functional elements of the magnetic assembly are individually machined to tolerances within a thousandth of an inch. High efficiency and clean, crisp, low-distortion sound reproduction are the result.

How A Loudspeaker Works

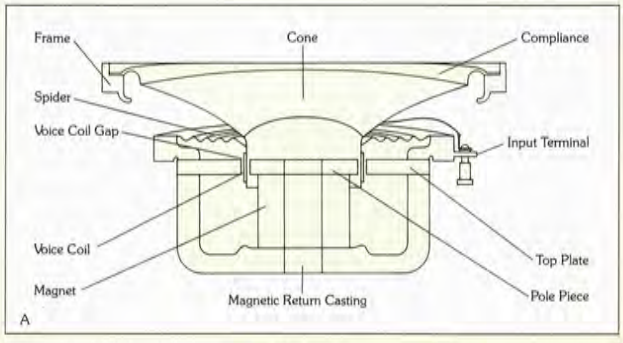
A—The advantages of JBL construction techniques become clear once you have an understanding of how a loudspeaker functions.

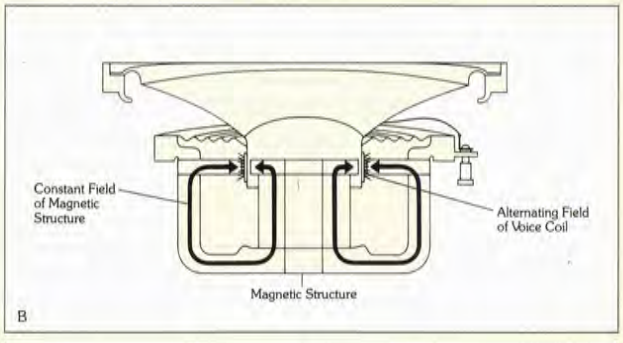
B—In a magnet structure, there is a constant flow of energy concentrated in the magnetic gap, indicated by arrows. Within this tiny gap lies the voice coil assembly which is attached to the cone and spider.

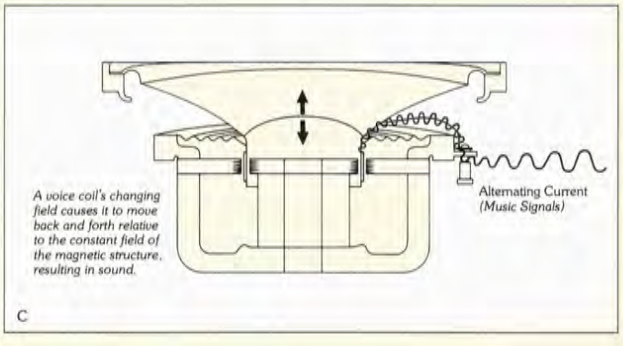
C—Your amplifier or receiver sends music in the form of an alternating current to the voice coil, surrounding it with a temporary magnetic field of its own. Because an alternating current changes the polarity of this temporary magnetic field, it moves the voice coil back and forth in relation to the constant field in the magnetic structure. This moves the cone too, which excites the air in front of it, resulting in sound.

A deceptively simple process. Yet almost all loudspeakers function this way, whether acoustic suspension, omnidirectional, ducted port or countless similar variations. So, regardless of acoustic principle, sound quality is a direct result of a loudspeaker's ability to convert the music signal from your amplifier into mechanical motion.

Because mechanical motion occurs when a voice coil's field interacts with the field of the magnetic structure, these areas of a loudspeaker are vitally important to sound quality. The slightest compromise can adversely affect performance.







136A Low Frequency Loudspeaker

1—Cone Specifically compounded for each application to achieve optimum mass, density and stiffness, resulting in outstanding low frequency performance.

2—Compliance Critically engineered suspension prevents sound from being reflected back through the cone. Permits exceptionally linear cone travel throughout its operating range.

3—Top Plate Precisely machined of high conductivity iron to prevent losses of magnetic strength. Conducts energy from the magnetic return casting, concentrating it in the voice coil gap.

4—Pole Piece Conducts energy to the exact center of the voice coil gap. Precision machined of high conductivity iron.

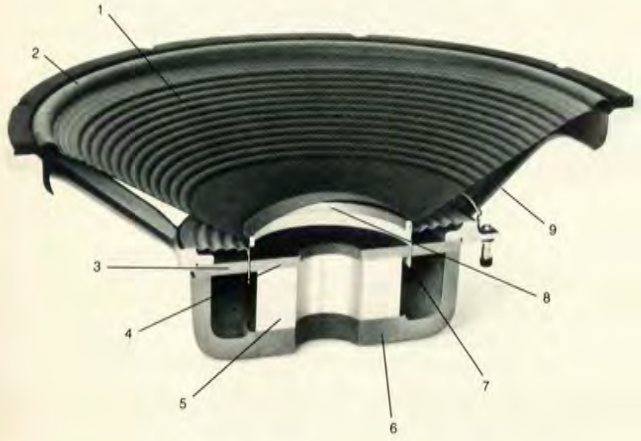
5—Alnico V Magnet Approximately 250% more energy than a ceramic (ferrite) magnet of comparable weight.

6—Low-Loss Magnetic Return Casting Made of heavy ductile iron which provides a more efficient magnetic path than less costly material and prevents losses of magnetic energy.

7—Edgewound Voice Coil Made from copper wire milled to a ribbon and hand wound on edge. Places 24% more conductor in the voice coil gap than commonly used round wire, increasing efficiency and power handling capacity.

8—Mass-Controlling Ring Provides just the right amount of mass for optimum bass characteristics. The die cast ring also adds mechanical strength at the apex of the cone, improving smoothness of response in the upper region of the loudspeaker's performance.

9—Cast Aluminum Frame Precisely centers and supports the cone/voice coil assembly. Its structural rigidity strongly resists warpage.



LE85 Compression Driver and Horn Assembly

1—Exponential Horn Heavy aluminum casting prevents undesirable resonances. The exponential design acoustically matches the compression driver.

2—Low-Loss Magnetic Return Casting Made of heavy ductile iron which provides a more efficient magnetic path than less costly material and prevents losses of magnetic energy.

3—Alnico V Magnet Approximately 250% more energy than a ceramic (ferrite) magnet of comparable weight.

4—Inner Horn Throat Die cast to provide smooth transition of sound waves traveling from the phasing plug into the exponential horn.

5—Phasing Plug Precise die cast shape loads entire surface of diaphragm uniformly, achieving smooth, linear frequency response characteristics.

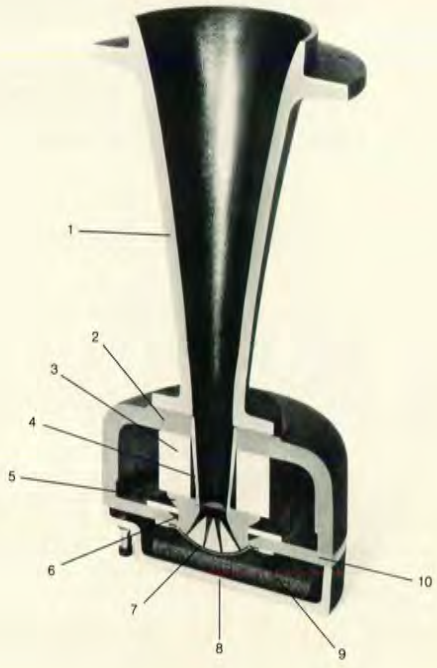
6—Silver Impedance-Controlling Ring A coating of pure silver is applied to the phasing plug, extending high frequency response to the limits of audibility.

7—Diaphragm Pneumatically formed of a .002-inch thick fatigue-resistant aluminum alloy. Its extremely low mass contributes to superb transient response and high efficiency.

8—Cover Aluminum die casting with strengthening ribs prevents resonances that might occur with less rigid construction.

9—Edgewound Voice Coil Made from aluminum wire milled to a ribbon and hand wound on edge. Places 24% more conductor in the voice coil gap than commonly used round wire, increasing efficiency and power handling capacity.

10—Top Plate Precisely machined of high-conductivity iron which prevents losses of magnetic strength. Conducts energy from the magnetic return casting, concentrating it in a region vital to performance—the voice coil gap.



Full Range Loudspeakers

LE8T 8-inch Remarkably smooth, extended response never before realized in a unit only 8 inches in diameter. Performance in minimum volume enclosures cannot be approached by any other loudspeaker. Suitable for in-wall installation.

LE12C Composite Transducer A complete two-way JBL loudspeaker system integrated within a single chassis. The high frequency unit is identical in performance to the JBL LE20. The 12-inch low frequency loudspeaker has a 3-inch edgewound copper ribbon voice coil and a specially controlled cone suspension. A 3000-Hz dividing network is mounted directly on the cast aluminum frame.

LE14C Composite Transducer The LE14C has a radiating area equal to that of many 15-inch loudspeakers, yet may be installed in an enclosure which would ordinarily accept nothing larger than a 12-inch unit. The 4-inch edgewound copper ribbon voice coil of the bass loudspeaker permits concentric mounting of an independent high frequency radiator. The two transducers are coordinated and phased by the LX2-1 crossover network.

Extended Range Loudspeakers

D208 8-inch This maximum efficiency loudspeaker is an 8-inch version of the famous D130. The D208 can be used as an extension speaker and for mounting where space is at a premium.

D123 12-inch An outstanding speaker designed for compact enclosures of 2 cubic feet or more. Shallow enough for in-wall installations. Three-inch edgewound aluminum ribbon voice coil.

D131 12-inch 12-inch, maximum efficiency loudspeaker for use in ported enclosures. A 4-inch edgewound aluminum ribbon voice coil improves response, accuracy and power handling capabilities.

D130 15-inch Maximum efficiency unit with 4-inch edgewound aluminum ribbon voice coil and 12-pound magnetic assembly. The D130 balances perfectly with the 075 or LE175.

Low Frequency Loudspeakers

LE10A 10-inch Generates powerful bass fundamentals in enclosures as small as one cubic foot. Three-inch edgewound copper ribbon voice coil.

124A 12-inch Identical to the low frequency driver used in the JBL 4315 Studio Monitor, this powerful 12-inch loudspeaker can be used in ported enclosures having an internal volume of 2-5 cubic feet. Network and high frequency component combinations are the same as for the 15-inch 136A. The 124A features a 4-inch edgewound copper ribbon voice coil with a die cast mass-controlling ring, concentrating just the right amount of weight at the cone's apex for deep, tight bass while providing structural integrity for exceptional clarity and transient reproduction.

LE14A 14-inch A remarkable loudspeaker that delivers full, solid bass in enclosures as small as 1.5 cubic feet. 4-inch edgewound copper ribbon voice coil and massive magnetic assembly.

LE15A 15-inch Effortlessly reproduces lowest musical fundamentals, even at very high power levels. For installation in 5-12 cubic foot ported enclosures.

130A 15-inch Maximum efficiency low frequency loudspeaker designed primarily for use with the LE175DLH in large ported or horn-loaded enclosures.

136A 15-inch JBL's latest development in a 15-inch loudspeaker. The 136A can be used with a compression driver and the 077 ultra-high frequency ring radiator in enclosures of 4-8 cubic feet internal volume. Like the 124A, the 136A features a 4-inch edgewound copper ribbon voice coil, mass-controlling ring and 12-pound magnetic assembly.

Passive Radiators

A passive radiator can be used in conjunction with a specific JBL low frequency loudspeaker to effectively double its radiating area and enable it to reproduce richer, more robust bass tones, thus increasing the dynamic range and smoothing frequency response. Passive radiators are designed specifically for use with the LE8T, LE10A, LE15A, and 136A, respectively. They are not designed for use with other JBL speakers, or those of another manufacturer, and must be used in completely airtight enclosures.

PR8 8-inch For use in conjunction with the LE8T.

PR10 10-inch Used with the LE10A.

PR15 15-inch The PR15 complements the performance of the LE15A.

PR15C 15-inch Augments performance of the 136A.

Midrange Transducer

LE5-2 5-inch Exceptional clarity through the midrange region with response extending well up into the high frequency range. The LE5-2 is a rugged, powerful midrange loudspeaker for use above 800 Hz.

High Frequency Drivers

JBL compression drivers provide clear, crisp natural reproduction of speech and music. They utilize Alnico V magnets housed in heavy magnetic structures, and large, edgewound aluminum ribbon voice coils. Each unit employs a large, aluminum alloy diaphragm pneumatically formed and treated to achieve exceptional bandwidth and durability. The wavefront generated by the diaphragm is directed through the concentric channels of a precisely formed phasing plug to the horn mouth. Controlled dispersion is then achieved by a horn/lens assembly.

LE20 Direct Radiator A wide-range unit of exceptional versatility. Extends the high frequency range and adds brilliance to extended range loudspeakers. Balances perfectly with the LE14A and LE10A bass loudspeakers.

075 Ring Radiator The 075 utilizes an exclusive annular diaphragm for flat distortion-free response extending well above the limits of human hearing. It can be used above 2500 Hz with any JBL extended range loudspeaker, or it can be added to any JBL two-way system when used with the N7000 dividing network.

077 Ultra-High Frequency Ring Radiator The 077 features exceptionally wide dispersion with a sound character similar to that of the 075 ring radiator. Used in the L65 Jubal and the latest JBL studio monitors, the 077 is designed for operation above 6.5 kHz. An integral diffraction horn provides smooth reproduction through a distribution pattern of 130° horizontal and 40° vertical at 15 kHz, maintaining a pattern of 110° x 40° at 20 kHz.

LE175 Compression Driver Delivers smooth, accurate reproduction above 500 Hz at the intense volume levels required of larger loudspeaker systems.

LE85 Compression Driver Linear high frequency performance from 500 Hz to beyond the upper limits of audibility. Similar to the LE175 with a more massive magnetic assembly for extended bandwidth.

375 Compression Driver The ultimate for midrange (500 Hz to 10 kHz) reproduction. Steep waveforms of explosive loudness are effortlessly reproduced by the precision engineered 4-inch edgewound ribbon voice coil and aluminum diaphragm.

High Frequency Horns and Lenses

JBL horn/lens assemblies, designed according to advanced sound wave propagation theory, provide wide dispersion and uniform high frequency sound distribution.

JBL exponential horns are rigid aluminum castings that function without adding resonance or distortion. The internal taper of the horn causes the wavefront generated by a compression driver to expand gradually at a controlled rate, thus providing the proper load on the driver diaphragm. The horn taper rate is responsible for the vertical dispersion pattern of the horn/lens assembly.

An acoustic lens functions in a manner analogous to a divergent optical lens. It consists of a series of physical barriers designed to increase the distance traveled by the energy at the edges of the wavefront while energy toward the center of the wave is relatively unaffected. The specific horizontal distribution pattern of the horn/lens assembly is governed by the configuration of the barriers making up the acoustic lens and the taper rate of the horn. After passing through the lens the wavefront continues traveling in its original direction.

HL87 Horn/Lens Cast aluminum horn/lens for 60° dispersion in circular symmetry. For use with the LE175 and LE85 compression drivers.

HL88 Horn/Lens Similar in construction and principle to the HL87, providing 70° conical dispersion for systems with the 375 compression driver. The HL88 mounts on top of an enclosure using the brackets supplied.

HL89 Horn/Lens For high performance systems incorporating the 375 compression driver. The complex appearance of the lens is the result of folding the plates in a series of 45° planes to reduce depth. May be mounted on the enclosure baffle or on top of the enclosure using the MA25 mounting kit.

HL90 Horn/Lens Exceptionally wide dispersion for high powered systems incorporating the 375 compression driver. The HL90 incorporates a 36-inch slant-plate lens backed by a 12-inch elliptical exponential horn similar to that used in the JBL Paragon. Brackets are supplied to mount the HL90 on top of an enclosure.

HL91 Horn/Lens An exponential horn having an optimum crossover frequency of 500 Hz and a 10-inch slant-plate acoustic lens for use with the LE175 and LE85 compression drivers.

HL92 Horn/Lens A longer cast aluminum horn with optimum crossover characteristics at 800 Hz for use with the LE175 and LE85 compression drivers. Utilizing the 10-inch slant-plate lens, the additional length of the horn offers smoother performance and is preferred if enclosure depth is adequate for mounting.

HL93 Horn/Lens Combines a shorter cast aluminum horn designed for the 375 compression driver with the 10-inch slant-plate acoustic lens.

N1200 Frequency Dividing Network

1—Binding Post Spring loaded for a tight connection and easy use. Soldering not required.

2—Mounting Flange and Container Cast aluminum mounting flange simplifies installation and maintains an airtight seal with the enclosure.

3—Low Frequency Capacitor Connected in parallel with the low frequency loudspeaker, this capacitor complements the inductor, to reduce the high frequency portion of the audio signal to achieve the desired crossover characteristics.

4—Conjugate Capacitor Used with a resistor to control and maintain constant impedance of the low frequency loudspeaker, and constant resistance in the low frequency section of the crossover network.

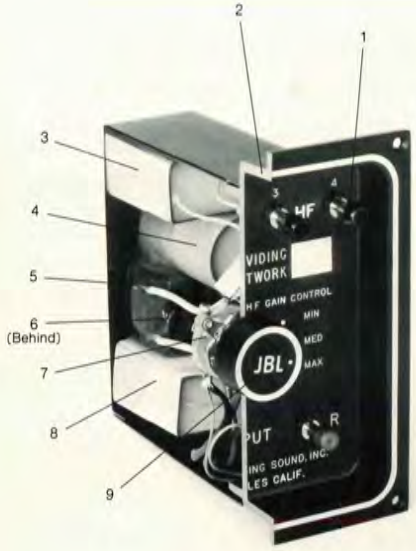
5—Low Frequency Inductor Reduces the strength of signals above the crossover frequency. Wired in series with the low frequency loudspeaker, the inductor works in conjunction with a capacitor to achieve the desired crossover slope.

6—High Frequency Inductor (Behind) Connected across the high frequency driver to further reduce low frequency signals. Operates with the high frequency capacitor to achieve the desired attenuation rate and maintain a low source impedance for the high frequency driver. In addition, this inductor is also an autotransformer having three sets of output taps connected to the level control, allowing adjustment of system balance.

7—Resistor Several non-inductive resistors are used at various points in the circuit.

8—High Frequency Capacitor In series with the high frequency driver, this capacitor permits only treble signals to pass, attenuating signals below the crossover frequency.

9—Level Control Adjusts relative loudness of the high frequency driver to accommodate room acoustics and listener preference.



Frequency Dividing Networks

JBL dividing networks provide an imperceptible distribution of the audio signal between low and high frequency reproducers. The finest electronic components are used throughout, non-inductive, non-polarized capacitors having high AC current capacity, individually adjusted low-loss inductors and high quality attenuator controls. Each unit is hand-wired and carefully tested, then compared with a laboratory prototype.

All JBL networks are engineered to match the exact characteristics of specific low frequency and high frequency transducers and the horn/lens assembly, if appropriate, as shown in the Network Selection Chart. We do not recommend combining JBL loudspeaker system components with those of other manufacturers due to the difficulty of predicting compatibility of the components within such systems.

Network Selection Chart

Network Model	System Power Capacity[1]	Crossover Frequency	Low Frequency Loudspeaker	High Frequency Transducer	Horn/Lens Assembly	Level Control	Input Impedance	Shipping Weight
LX2	35 Watts	2500 Hz	D123, D208	LE20		Continuously variable	8 ohms	2 lbs (0.9 kg)
LX5	100 Watts[2]	500 Hz	LE15A	LE175, LE85 375[3]	HL91 HL93	3-position switch	8 ohms	6 lbs (2.7 kg)
LX8	35 Watts	2000 Hz	LE14A	LE20		3-position switch	8 ohms	2 lbs (0.9 kg)
LX10	50 Watts	1500 Hz	LE14A	LE175, LE85	HL87 HL91	Continuously variable	8 ohms	2 lbs (0.9 kg)
LX11	35 Watts	2500 Hz	LE10A	LE20		3-position switch	8 ohms	2 lbs (0.9 kg)
LX50	125 Watts	500 Hz	136A	375	HL88, HL89 HL90	Continuously variable	8 ohms	6 lbs (2.7 kg)
LX80	100 Watts[2]	800 Hz	136A	LE175, LE85 375[3]	HL92 HL93	Continuously variable	8 ohms	6 lbs (2.7 kg)
N502	125 Watts	500 Hz	130A	375	HL88, HL89 HL90	5-position strap	8 ohms	14 lbs (6.4 kg)
N802	125 Watts	800 Hz	130A	375	HL88, HL89 HL90	5-position strap	8 ohms	14 lbs (6.4 kg)
N1200	60 Watts	1200 Hz	D130, D131 130A	LE175, LE85	HL87, HL91	3-position switch	8 ohms	4 lbs (1.8 kg)
N2400	35 Watts	2500 Hz	D130, D131 D123	075		Continuously variable	8 ohms	2 lbs (0.9 kg)
N7000	[4]	7000 Hz	375	075, 077		Continuously variable	8 ohms	2 lbs (0.9 kg)
N8000	[5]	8000 Hz	LE175, LE85	075, 077		Continuously variable	8 ohms	2 lbs (0.9 kg)

[1] Power capacity of the drivers, network and horn/lens assembly expressed in Watts continuous program, based on a laboratory test signal. See Power Capacity section for amplifier power recommendation.

[2] 125 Watts continuous program when the 375 compression driver and the HL93 horn/lens are used.

[3] Special high frequency attenuation circuit matches the 16-ohm 375 was well as the 8-ohm LE175/LE85 without affecting crossover characteristics.

[4] Permits adding the 075 or 077 for added brilliance in any JBL system utilizing the 375 compression driver. Power capacity will be that of the two-way system to which the unit is added.

[5] Permits adding the 075 or 077 for added brilliance in any JBL system utilizing the LE175 or LE85 compression driver. Power capacity will be that of the two-way system to which the unit is added.

Specifications

Full Range Loudspeakers

	LE8T	LE12C	LE14C
Diameter			
Low Frequency	8" (20 cm)	12" (30 cm)	14" (36 cm)
High Frequency		2" (5 cm)	2" (5 cm)
Power Capacity[1] (continuous program)	40 Watts	35 Watts	35 Watts
Nominal Impedance	8 ohms	8 ohms	8 ohms
Dispersion	90°	90°	90°
Crossover Frequency		3000 Hz	2000 Hz
System Sensitivity (SPL)[2]	76 dB	78 dB	80 dB
Voice Coil Diameter:			
Low Frequency	2" (5.1 cm)	3" (7.6 cm)	4" (10.2 cm)
High Frequency		5/8" (1.6 cm)	5/8" (1.6 cm)
Voice Coil Material			
Low Frequency (edgewound ribbon)	aluminum	copper	copper
High Frequency		copper	copper
Magnetic Assembly Weight	6½ lbs (3.0 kg)	8¼ lbs[3] (3.7 kg)	13 lbs (5.9 kg)
Flux Density (gauss)			
Low Frequency	8500	10,400	11,000
High Frequency		12,000	12,000
EIA Sensitivity (SPL)[4]	40 dB	42 dB	44 dB
Depth	3⅞" (9.8 cm)	4¼" (10.8 cm)	5⅜" (13.7 cm)
Recommended Enclosure Volume	0.75-4 cu. ft. (21-113 liters)	1.5-6 cu. ft. (42-169 liters)	1.5-6 cu. ft. (42-169 liters)
Shipping Weight	9 lbs (4.1 kg)	13 lbs (5.9 kg)	22 lbs (10.0 kg)

[1] Based on a laboratory test signal. See Power Capacity section for amplifier power recommendation.

[2] System Sensitivity is the sound pressure level generated at 15 feet (4.6 m) with a 1-Watt input.

[3] Total weight of low and high frequency assemblies weighing 6¾ lbs (3.1 kg) and 1½ lbs (0.7 kg) respectively.

[4] EIA Sensitivity is the sound pressure level generated at 30 feet (9.1 m) with a 1-milliwatt, 1-kHz input.

Extended Range Loudspeakers

	D208	D123	D131	D130
Diameter	8" (20 cm)	12" (30 cm)	12" (30 cm)	15" (38 cm)
Power Capacity[1] (continuous program)	30 Watts	50 Watts	60 Watts	60 Watts
Nominal Impedance	8 ohms	8 ohms	8 ohms	8 ohms
Dispersion	90°	90°	90°	90°
Equivalent System Sensitivity (SPL)[2]	84 dB	85 dB	88 dB	90 dB
Voice Coil Diameter	2" (5.1 cm)	3" (7.6 cm)	4" (10.2 cm)	4" (10.2 cm)
Voice Coil Material (edgewound ribbon)	aluminum	aluminum	aluminum	aluminum
Magnetic Assembly Weight	3½ lbs (1.6 kg)	6¾ lbs (3.1kg)	12 lbs (5.4 kg)	12 lbs (5.4 kg)
Flux Density (gauss)	8900	10,400	12,000	12,000
EIA Sensitivity (SPL)[3]	48 dB	49 dB	52 dB	54 dB
Depth	3" (7.6 cm)	4" (10.2 cm)	4⅞" (12.4 cm)	5⅝" (14.3 cm)
Recommended Enclosure Volume	1.5-4 cu. ft. (42-113 liters)	2-5 cu. ft. (56-141 liters)	4-12 cu. ft. (113-338 liters)	4-12 cu. ft. (113-338 liters)
Shipping Weight	5 lbs (2.3 kg)	11 lbs (5.0 kg)	16 lbs (7.3 kg)	19 lbs (8.6 kg)

[1] Based on a laboratory test signal. See Power Capacity section for amplifier power recommendation.

[2] Equivalent System Sensitivity is the sound pressure level that would be generated at 15 feet (4.6 m) with a 1-Watt input by a loudspeaker system using the indicated low frequency loudspeaker.

[3] EIA Sensitivity is the sound pressure level generated at 30 feet (9.1 m) with a 1-milliwatt, 1-kHz input.

Low Frequency Loudspeakers

	LE10A	124A	LE14A
Diameter	10" (25 cm)	12" (30 cm)	14" (36 cm)
Power Capacity[1] (continuous program)	60 Watts	100 Watts	70 Watts
Nominal Impedance	8 ohms	8 ohms	8 ohms
Equivalent System Sensitivity (SPL)[2]	78 dB	76 dB	80 dB
Voice Coil Diameter	3" (7.6 cm)	4" (10.2 cm)	4" (10.2 cm)
Voice Coil Material (edgewound ribbon)	copper	copper	copper
Magnetic Assembly Weight	6½ lbs (3.0 kg)	12 lbs (5.4 kg)	12 lbs (5.4 kg)
Flux Density (gauss)	10,000	12,000	11,000
Sensitivity (SPL)[3]	42 dB	40 dB	44 dB
Depth	4¼" (10.8 cm)	4¾" (12.1 cm)	5⅜" (13.7 cm)
Recommended Enclosure Volume	1-4 cu. ft. (28-113 liters)	2-5 cu. ft. (56-141 liters)	1.5-6 cu. ft. (42-169 liters)
Shipping Weight	9 lbs (4.1 kg)	16 lbs (7.3 kg)	18 lbs (8.2 kg)

	LE15A	130A	136A
Diameter	15" (38 cm)	15" (38 cm)	15" (38 cm)
Power Capacity[1] (continuous program)	120 Watts	60 Watts	100 Watts
Nominal Impedance	8 ohms	8 ohms	8 ohms
Equivalent System Sensitivity (SPL)[2]	81 dB	88 dB	80 dB
Voice Coil Diameter	4" (10.2 cm)	4" (10.2 cm)	4" (10.2 cm)
Voice Coil Material (edgewound ribbon)	copper	copper	copper
Magnetic Assembly Weight	20 lbs (9.1 kg)	13 lbs (5.9 kg)	12 lbs (5.4 kg)
Flux Density (gauss)	11,000	12,000	12,000
Sensitivity (SPL)[3]	45 dB	52 dB	44 dB
Depth	5⅞" (14.9 cm)	5¾" (14.6 cm)	5⅝" (14.3 cm)
Recommended Enclosure Volume	5-12 cu. ft. (141-338 liters)	4-12 cu. ft. (113-338 liters)	4-8 cu. ft. (113-225 liters)
Shipping Weight	26 lbs (11.8 kg)	19 lbs (8.6 kg)	19 lbs (8.6 kg)

[1] Based on a laboratory test signal. See Power Capacity section for amplifier power recommendation.

[2] Equivalent System Sensitivity is the sound pressure level that would be generated at 15 feet (4.6 m) with a 1-Watt input by a loudspeaker system using the indicated low frequency loudspeaker.

[3] Since the major portion of the energy reproduced by a low frequency loudspeaker lies below 800 Hz, the sound pressure level was measured at 30 feet (9.1 m) using a 1-milliwatt test signal warbled from 100 to 500 Hz, rather than the conventional 1-kHz sine wave test signal on which the EIA sensitivity rating is based.

Passive Radiators

	PR8	PR10	PR15	PR15C
Diameter	8" (20 cm)	10" (25 cm)	15" (38 cm)	15" (38 cm)
Complementary Driver	LE8T	LE10A	LE15A	136A
Depth	1¾" (4.4 cm)	2⅛" (5.4 cm)	3⅜" (8.6 cm)	3⅜" (8.6 cm)
Recommended Enclosure Volume	0.75-2 cu. ft. (21-56 liters)	1-3 cu. ft. (28-84 liters)	5-8 cu. ft. (140-225 liters)	4-8 cu. ft. (113-225 liters)
Shipping Weight	2 lbs (0.9 kg)	3 lbs (1.4 kg)	7 lbs (3.2 kg)	7 lbs (3.2 kg)

Midrange Transducer

	LE5-2
Diameter	5" (13 cm)
Power Capacity[1] (continuous program)	40 Watts
Nominal Impedance	8 ohms
Voice Coil Diameter	⅞" (2.2 cm)
Voice Coil Material	copper
Magnetic Assembly Weight	2¾ lbs (1.2 kg)
Flux Density (gauss)	16,500
Sensitivity[2]	46 dB SPL
Recommended Enclosure Volume	80 cu. in. (1.3 liters) minimum
Shipping Weight	4 lbs (1.8 kg)

[1] Based on a laboratory test signal. See Power Capacity section for amplifier power recommendation.

[2] Averaged sensitivity above 800 Hz within 1 dB. Taken at 30 feet (9.1 m) with a 1-milliwatt input.

High Frequency Drivers

	LE20	075	077
Radiating Diameter	2" (5 cm)	3.125" (7.9 cm)	3.125" (7.9 cm)
Power Capacity[1] (continuous program)	35 Watts	20 Watts	20 Watts
Nominal Impedance	8 ohms	8 ohms	8 ohms
Voice Coil Diameter	⅝" (1.6 cm)	1¾" (4.4 cm)	1¾" (4.4 cm)
Voice Coil Material	copper	aluminum[2]	aluminum[2]
Magnetic Assembly Weight	1½ lbs (0.7 kg)	3¼ lbs (1.5 kg)	3¼ lbs (1.5 kg)
Flux Density (gauss)	12,000	16,500	16,500
Sensitivity (SPL)	44 dB[3]	61 dB[4]	56 dB[5]
Maximum Diameter	5⅜" (13.7 cm)	3⅞" (9.8 cm)	3⅞" (9.8 cm)
Depth	2 1/16" (5.2 cm)	3¼" (8.3 cm)	3¼" (8.3 cm)
Shipping Weight	3 lbs (1.4 kg)	5 lbs (2.3 kg)	5 lbs (2.3 kg)

	LE175	LE85	375
Throat Diameter	1" (2.5 cm)	1" (2.5 cm)	2" (5.1 cm)
Power Capacity[1] (continuous program)	30 Watts	30 Watts	60 Watts
Nominal Impedance	8 ohms	8 ohms	16 ohms
Voice Coil Diameter	1¾" (4.4 cm)	1¾" (4.4 cm)	4" (10.2 cm)
Voice Coil Material (edgewound ribbon)	aluminum	aluminum	aluminum
Magnetic Assembly Weight	7½ lbs (3.4 kg)	10 lbs (4.5 kg)	23¾ lbs (10.8 kg)
Flux Density (gauss)	16,000	19,000	20,500
Sensitivity (SPL)[6]	59 dB	59 dB	59 dB
Diameter	4½" (11.4 cm)	5¾" (14.6 cm)	7" (18 cm)
Depth	3⅜" (9.8 cm)	3⅜" (9.8 cm)	5¼" (13 cm)
Shipping Weight	9 lbs (4.1 kg)	12 lbs (5.4 kg)	26 lbs (11.8 kg)

[1] Based on a laboratory test signal. See Power Capacity section for amplifier power recommendation.

[2] Edgewound ribbon voice coil.

[3] Averaged sensitivity above 2 kHz.

[4] Averaged sensitivity above 4 kHz.

[5] Averaged sensitivity above 7 kHz.

[6] Averaged sensitivity above 1 kHz within 1 dB. Measured at 30 feet (9.1 m) with a 1-milliwatt input using the recommended horn/lens assembly.

High Frequency Horns and Lenses

	HL87	HL88	HL89	HL90
Dispersion Pattern (horizontal x vertical)	60°[1]	70°[1]	100° x 45°	140° x 45°
Throat Diameter	1" (2.5 cm)	2" (5 cm)	2" (5 cm)	2" (5 cm)
Use Above	1200 Hz	500 Hz	500 Hz	500 Hz
Type Lens	perforated plate	perforated plate	serpentine	slant plate
Lens Dimensions (height x width x depth)	5¼" (13.3 cm) diameter	13½" (34.3 cm) diameter	6 13/16" x 19⅞" x 4⅝" (17.3 x 27.6 x 11.7 cm)	14¼" x 36" x 6¾" (36.2 x 91.4 x 17.2 cm)
Recommended Driver	LE175 LE85	375	375	375
Extension Behind Baffle Panel	6¾"[2] (17.1 cm)	free standing	12" (30 cm)	free standing
Total Depth	6¾"[2] (17.1 cm)	15¾" (40 cm)	16⅝"[3] (42.2 cm)	18¾"[3] (47.6 cm)
Shipping Weight	4 lbs (1.8 kg)	35 lbs (15.9 kg)	16 lbs (7.3 kg)	42 lbs (19.1 kg)

	HL91	HL92	HL93
Dispersion Pattern (horizontal x vertical)	90° x 45°	90° x 45°	90° x 45°
Throat Diameter	1" (2.5 cm)	1" (2.5 cm)	2" (5 cm)
Use Above	500 Hz	800 Hz	500 Hz
Type Lens	slant plate	slant plate	slant plate
Lens Dimensions (height x width x depth)	6⅛" x 10" x 2½" (15 x 25 x 6 cm)	6⅛" x 10" x 2½" (15 x 25 x 6 cm)	6⅛" x 10" x 2½" (15 x 25 x 6 cm)
Recommended Driver	LE175 LE85	LE175 LE85	375
Extension Behind Baffle Panel	7¾" (20 cm)	10¾" (27.3 cm)	4" (10.2 cm)
Total Depth	8½"[4] (21.6 cm)	11½"[4] (29.3 cm)	4⅝"[4] (17.3 cm)
Shipping Weight	5 lbs (2.3 kg)	6 lbs (2.7 kg)	5 lbs (2.3 kg)

[1] Conical pattern.

[2] Total depth. Extension behind baffle dependent on panel thickness.

[3] Total length when free standing, includes depth of lens.

[4] Horn depth only. Lens mounts on the front surface of the baffle panel and is 2½" (6 cm) deep.

A Note on Specifications

When evaluating specifications, it is important to note that the specific test conditions used, plus the degree to which various factors can be legitimately altered, are extremely important—yet seldom stated. Even when using accepted methods of measurement, it is possible for two reputable laboratories to develop very different sets of specifications for the same loudspeaker. Quite often specifications confuse, rather than assist the critical listener in evaluating a loudspeaker system. The final analysis, therefore, should be made on the basis of careful listening comparisons using familiar material and high quality program sources.

A Note on Efficiency

"System Sensitivity" and "Equivalent System Sensitivity" ratings refer to the sound pressure level produced by a 1-Watt input measured on-axis at 15 feet (4.57 m) from the sound source. These specifications are used throughout JBL literature to indicate that JBL loudspeaker systems and components generate substantial acoustic output from very little input power. Note that 75-80 dB is a comfortable listening level.

Accessories

MA25 Horn/Lens Mounting Kit Consists of a cast iron rear mount and front support brackets for the HL89. The cast iron mount attaches at the 4-bolt flange of the horn and is held in place by the same bolts that secure the horn to the driver. The mount is 13⅛" (33.2 cm) high and allows adjustment of driver height in 1-inch (2.5 cm) increments. The base mounts on a horizontal surface with mounting holes spaced 9¼" (23.5 cm) apart.

MA15 Loudspeaker Mounting Kit Simplifies front mounting of 15-inch loudspeakers, permitting a degree of flexibility in the diameter of the mounting cutout. The MA15 is particularly helpful when utilizing an existing enclosure or baffle panel. The kit consists of a sealing gasket, four cast clamps and four mounting screws with T-nuts. The clamps and mounting hardware can be used with JBL 12-inch loudspeakers, but it will be necessary to fashion a custom gasket for such applications.

Power Capacity

The specified power capacity indicates the continuous program power level that can be accepted without damage. The peak power capacity is considerably greater than the continuous rated value, as indicated by the remarkable transient response of JBL loudspeaker system components. JBL loudspeakers will reproduce clean sound at comfortable listening levels when driven by an amplifier having an output of as little as 10 Watts RMS per channel. However, for reproduction of the full dynamic range of contemporary recordings at high volume, a more powerful, quality amplifier will provide optimum performance. Individual full range or extended range loudspeakers, or loudspeakers installed in systems rated up to 50 Watts continuous program may be driven by an amplifier delivering up to 75 Watts RMS per channel; those having a rated power capacity of 50 Watts continuous program or greater may be used with an amplifier delivering up to 150 Watts RMS per channel. Such amplifiers have the reserve power necessary for accurate reproduction of transients, which can reach momentary peaks equivalent to ten times the average power level. In almost all cases, the volume level generated by a JBL loudspeaker will become noticeably discomforting to the ear before the loudspeaker can be damaged by excessive power from the amplifier.

Enclosure Construction Kit

Consists of a brochure and complete construction drawings prepared by the JBL technical staff. The brochure contains an explanation of loudspeaker theory and bass reflex loading techniques appropriate for home entertainment and musical instrument applications. A full set of construction drawings, validated by JBL engineers, are included for 3-, 5- and 8-cubic foot enclosures for use with JBL component systems. The kit can be obtained from your JBL Audio Specialist or by sending $5 (California residents add 6% sales tax) directly to the JBL Technical Information Department.

Full Five-Year Warranty

Every JBL individual loudspeaker component or loudspeaker system is fully warranted under the provisions of the *Magnuson-Moss* Federal Warranty Act against defects in material and workmanship for a period of five years. JBL will replace defective parts and make necessary repairs under this warranty, without charge to the consumer. This warranty does not cover damage caused by misuse, accident or neglect. JBL retains the right to make such determination on the basis of factory inspection.

Moreover, because we believe that a fine loudspeaker, like a fine musical instrument, should never wear out, we will repair any JBL transducer free of charge without time limitation if factory inspection discloses evidence of an original manufacturing defect.

If it is impractical to return the product to the factory, please write to JBL describing the difficulty or malfunction. JBL may establish alternative repair procedures or furnish replacement parts as appropriate. For example, a number of JBL dealers have qualified as Authorized JBL Servicing Dealers.

The warranty on JBL products shall remain valid only if repairs are performed by JBL or under its authorized procedures, and provided that the serial numbers on the units have not been defaced or removed. Products returned to the factory must be shipped prepaid.

For Additional Information

JBL maintains a technical staff to answer questions pertaining to JBL loudspeaker systems and components. Inquiries should be directed to the JBL Technical Information Department.

JBL

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