JBL L166 Horizon

Loudspeaker systems are designed for specific purposes—many of them unrelated to high fidelity sound in the home. The variations include speech projection, concert hall reinforcement, recording studio monitoring—even the lowly intercom.

The level of technical refinement in engineering and manufacturing achieved at JBL has led traditionally to its identification with the massive loudspeaker arrays assembled around leading musical groups, or the monitor systems used in major recording studios. For many listeners, the choice of JBL for the home assures the same quality of sound.

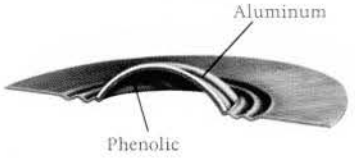
The L166 was designed to exploit the spectacular potential of a novel high frequency transducer developed in JBL laboratories, the 066. The result was a three-way system whose components were selected to complement the remarkable performance of the 066 in a bookshelf size enclosure. Its power handling capacity and extremely wide bandwidth enable it to reproduce the most complex program material effortlessly.

The Hemispherical Radiator

The JBL 066 Hemispherical Radiator is a variant of the dome-type tweeter with several significant differences.

The 066 features a one-inch diameter hardened dome, comprising resin impregnated linen (phenolic) and aluminum. A vapor deposition process is used to adhere the aluminum to the phenolic, eliminating the stress factors normally associated with traditional lamination processes.

The result is an extremely hard surface which reduces mechanical distortion and provides a degree of transient response rarely achieved in a high frequency radiator of this type.



The hemispherical design allows utilization of a large voice coil. The 066 voice coil is one-inch in diameter and made of aluminum wire. A cone radiator of similar size, limited to a smaller voice coil, cannot equal the 066's power handling capability. The large coil also dissipates heat more readily, ensuring far greater reliability when operated at extremely loud listening levels.

The radiating surfaces are equal, yet the 066 (below) utilizes a voice coil having twice the diameter.

Physical Vapor Deposition is a thin film process which is accomplished in a vacuum chamber at moderate temperature. An atmosphere containing aluminum molecules A is introduced into a heated vacuum chamber at B, passes across the phenolic dome and exits at C. In the process a thin film of aluminum is "grown" on the surface of the phenolic dome.

The 066 has a dispersion pattern of 150° horizontal and vertical at 20 kHz. Its small diameter permits achievement of 90° dispersion at a remarkable 30 kHz.

Note particularly the 066's integral baffle design, which completely eliminates radiation emanating from the edge compliance. If the radiation from the compliance were not captured by this integral baffle, the effective radiating diameter of the dome would be increased, thereby reducing dispersion.

The 066. Greater bandwidth and dispersion than any high frequency direct radiator yet produced by JBL.

Midrange

Midrange program material is reproduced by a five-inch loudspeaker. Its 7/8-inch copper voice coil is unusually large in relation to its cone diameter; the powerful magnetic assembly assures outstanding transient response and greater undistorted acoustic output.

Low Frequency

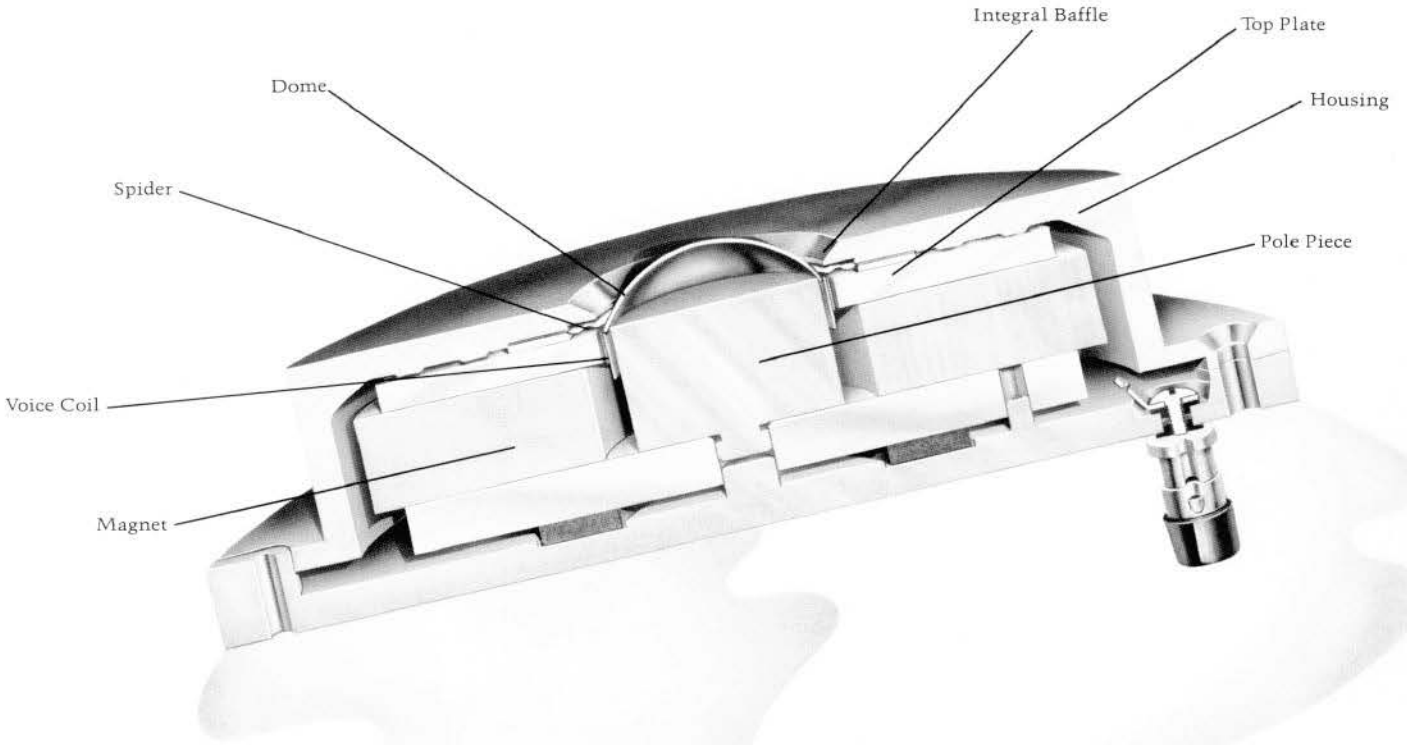
To balance the extended high frequency response of the 066 in a bookshelf size enclosure of 1.75 cubic feet, an entirely new low frequency transducer was developed. Starting with the successful design used in the L65, JBL engineers redesigned the entire magnetic assembly. They increased magnet size by 40% and enlarged the top plate and pole piece to place 40% more voice coil in the gap. The increase in magnetic power permitted the use of a harder and heavier cone for extended low frequency response. Precise cone assembly weight is controlled through use of the JBL Mass-Controlling Ring. (Patent pending).

Dividing Network

The tolerances of JBL network components are much more stringent than normal industry practices. A properly designed network does far more than direct low, midrange and high frequency information to the appropriate reproducer. Vitally important to the sound of a loudspeaker system is precise control of the drivers through the transition frequencies. The network of the L166 Horizon is designed with optimum cross over points which give a smooth response curve from lowest to highest frequencies reproduced.

Power Handling Capacity

The specified power handling capacity indicates the continuous program level that can be accepted by a JBL loudspeaker



The Hemispherical Radiator Actual size.

system without damage. Its peak power handling capacity is considerably greater than the continuous rated value, as reflected in the remarkable transient response of JBL loudspeaker system components. The L166 will produce 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 quality amplifier delivering up to 150 Watts RMS per channel will provide optimum performance. Such an amplifier has 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.

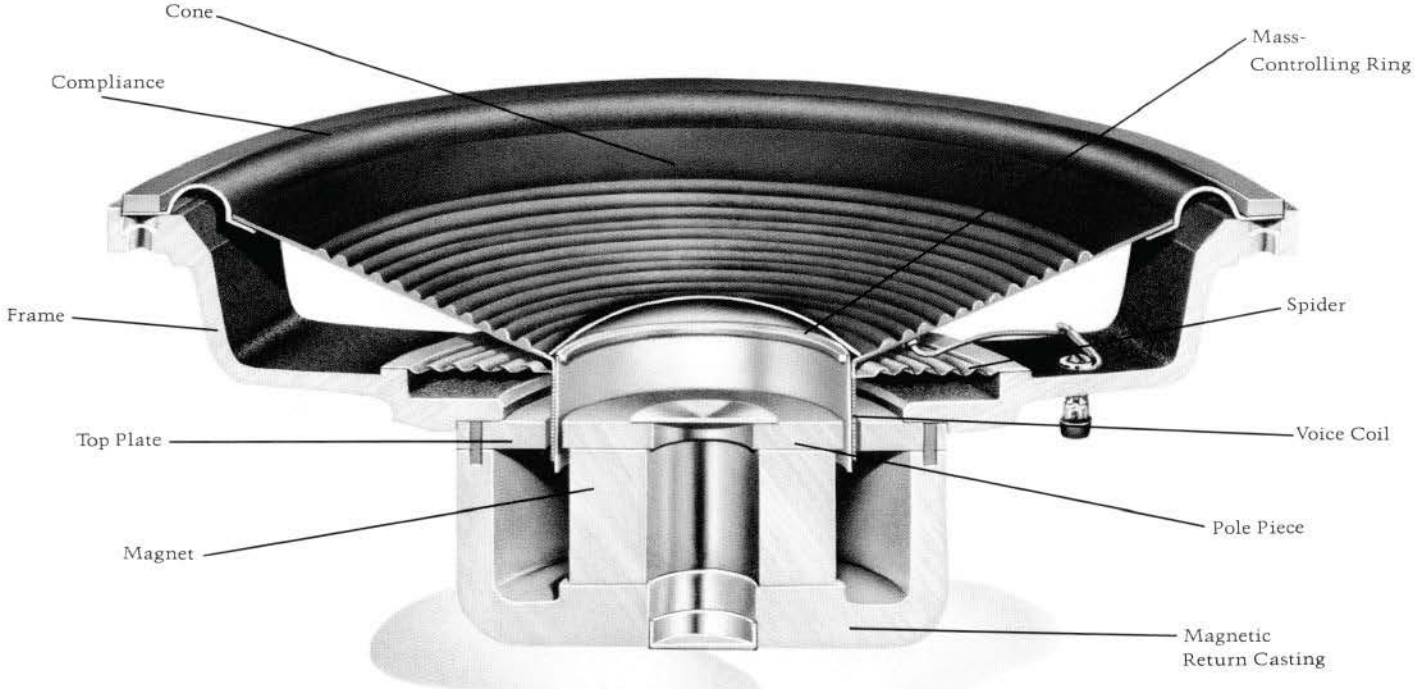
The Enclosure: Another JBL Milestone

Fittingly, this extraordinary speaker system is presented with a totally new grille material which advances the state of the art. The continuing materials research program that produced the foam grille of the original L100, has resulted in the development of a newer material, APP. APP is the most acoustically transparent grille material yet devised, having virtually zero effect on frequency response or dispersion. Readily molded into the distinctive geometric pattern of the L166, the material is vibration and resonance free.

The cabinet of the L166 is constructed to the established JBL standard. Only fine furniture hardwood veneers and high density compressed woods are used. Tight, lock-mitered joints are hand fitted and wood welded to eliminate undesirable warpage and vibration. The finish is hand-rubbed oiled walnut veneer on all four sides.

Specifications

Rather than repeat the ambiguity of most technical specifications, JBL has traditionally refrained from listing data for which no widely accepted test procedure has been established. In the absence of such standards any



Low Frequency Loudspeaker ½ scale.


JBL

well-equipped laboratory can legitimately produce a variety of frequency response curves for a loudspeaker, depending on the conditions selected. At JBL the final analyses are comprised of extensive listening sessions. Although laboratory data are an integral part of the process, the trained ear is the ultimate criterion. The success of this philosophy is reflected in the enthusiastic acceptance of JBL systems by recording studio engineers, producers and performers—professionals whose artistic achievements are closely related to the equipment they use.

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 is always warranted to equal or exceed the original design specifications unless otherwise stated.

James B. Lansing Sound, Inc.,
3249 Casitas Avenue,
Los Angeles, California 90039

Specifications

Power Capacity[1]	75 Watts continuous program
Nominal Impedance	8 ohms
Crossover Frequencies	1,000 and 6,000 Hz
System Sensitivity	1 Watt input produces 76 dB Sound Pressure Level at a distance of 15'

(Note: 75-80 dB is a comfortable listening level.)

Low Frequency Loudspeaker

Nominal Diameter	12 inches (30cm)
Voice Coil	3-inch (7.6cm) edgewound copper ribbon
Magnetic Assembly Weight	7½ pounds (3.4kg)
Flux Density	11,000 gauss
Sensitivity[2]	40 dB SPL

Midrange Transducer

Nominal Diameter	5 inches (13cm)
Voice Coil	⅞-inch (2.2cm) copper
Magnetic Assembly Weight	1⅝ pounds (0.7 kg)
Flux Density	15,000 gauss
Sensitivity[3]	46 dB SPL

High Frequency Hemispherical Radiator

Hemisphere Diameter	1-inch (2.5cm)
Dispersion	150° at 20 kHz
Voice Coil	1-inch (2.5cm) layer wound aluminum
Magnetic Assembly Weight	1½ pounds 0.680 kg
Flux Density	13,000 gauss
Sensitivity[4]	42 dB SPL
Finish	Oiled Walnut
Grille	APP
Dimensions	14¼" x 23½" x 13" deep 36.2cm x 59.7cm x 33.0cm deep
Shipping Weight	55 lbs. 25 kg

1. Based on a laboratory test signal. See Power Capacity section for amplifier power recommendation.
2. Since the major portion of the energy reproduced by the low frequency loudspeaker lies below 800 Hz, this specification has been developed by using a test signal warbled from 100 to 500 Hz, rather than the 1-kHz sine wave test signal on which the conventional EIA Sensitivity rating is based.
3. Averaged from 1 to 3 kHz, within 1 dB, measured at 30 feet (9.1 m) with a 1-milliwatt input.
4. Averaged from 5 to 20 kHz, within 1 dB, measured at 30 feet (9.1 m) with a 1 milliwatt input.

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