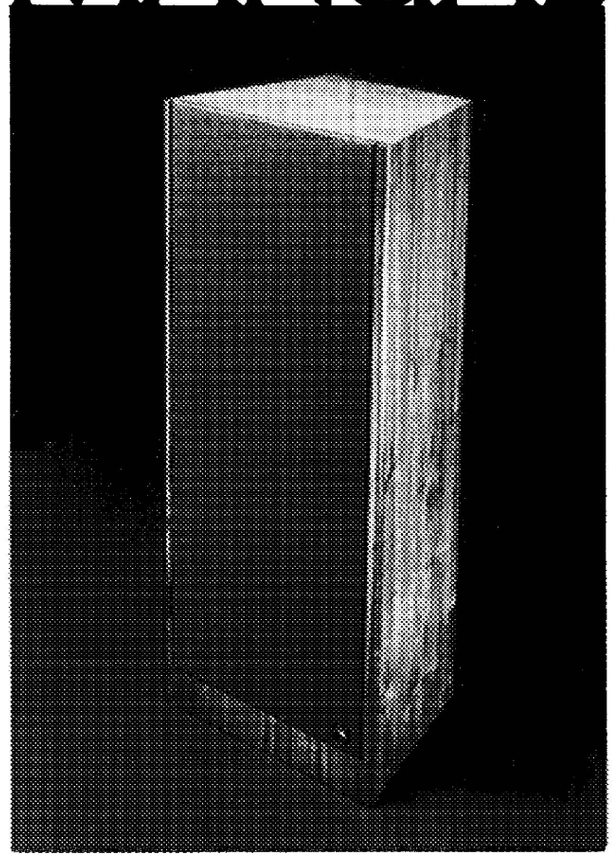
L220
INSTRUCTION MANUAL



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The JBL L220 offers accurate, studio quality reproduction and precise definition, the results of advanced and innovative engineering. Every facet of the L220 enhances the central design concept, which is to combine proper acoustic alignment of the drivers with the ideal flat baffle panel. This array gives the L220 a degree of realism and accuracy not otherwise possible in a loudspeaker system. Aligning the acoustic centers of the drivers ensures that frequencies are heard in the same relationship to each other as when they were recorded; the flat baffle allows the sound to radiate from a single plane, eliminating the undesirable reflections inherent in staggered baffle designs. In the successful realization of this design concept, JBL engineers utilized a unique refracting lens on the midrange loudspeaker and developed a new high frequency driver. The result of this careful and creative engineering is a loudspeaker system which is audibly superior. The relative positions of the various instruments and voices, the specific location and particular nuances of a solo instrument or individual voice, all are reproduced faithfully, with astonishing depth of image.

CONNECTING THE L220

The amplifier or receiver should be turned off before making any loudspeaker connections.

To connect loudspeaker systems placed up to 15 m (50 ft) from the amplifier, 1 mm (#18 AWG) insulated wire (ordinary household lamp cord) is the minimum size recommended. For greater distances, heavier wire is desirable: 1.3 mm (#16 AWG) for distances up to 30 m (100 ft) and 1.6 mm (#14 AWG) for distances up to 60 m (200 ft).

Connections to the loudspeaker system are made at the two terminals located on the back of the enclosure, near the bottom. The terminals will accept stranded or solid wire up to 2 mm (#12 AWG).

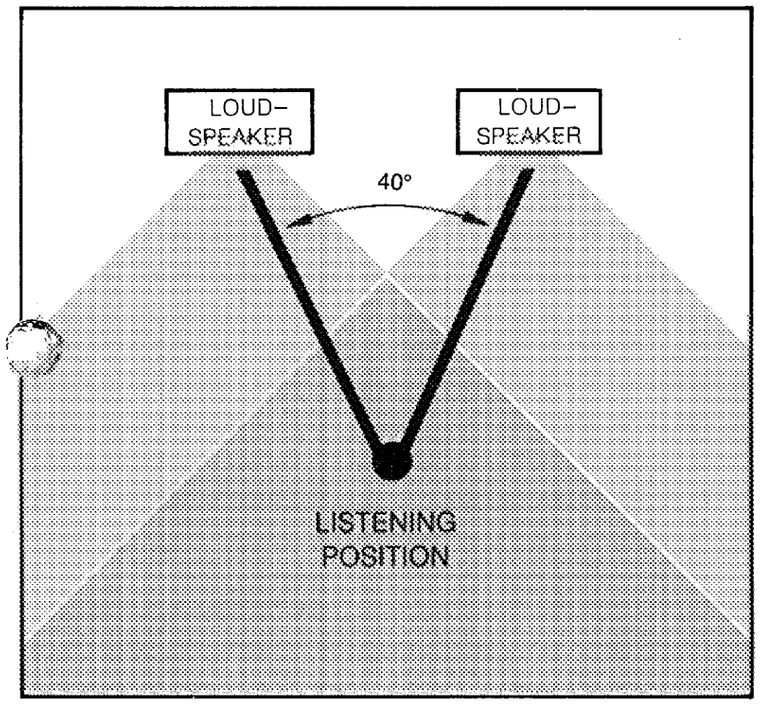
For each loudspeaker system connect the wire from the black terminal to the amplifier output terminal labeled "common," "ground," (−), or colored black, and the wire from the red terminal to the amplifier terminal labeled "8 ohms," "8 Ω," (+), or colored red. If lamp cord is used, the wires can be distinguished from one another by noting that one insulating jacket is smooth, while the other has a distinct ridge. Connecting both systems as described will ensure in-phase operation; i.e., their cones will respond to a monophonic signal by moving simultaneously in the same direction, and not opposite to each other. (Note: Some amplifiers have a chassis grounding terminal, which is usually isolated from the other connectors. This should not be confused with the "ground" designation sometimes used to describe one of the terminals in each set of loudspeaker connections.)

1. Strip approximately 20 mm (¾ in) of the insulation from the end of the wire. Twist the wire strands together.
2. Turn the terminal fully counterclockwise, insert the wire, then turn the terminal clockwise until the wire is secured. Rotate the terminal by hand—do not force it.

PLACEMENT

The performance of any loudspeaker system is affected by room placement. For example, bass response will be augmented if the enclosures are placed near adjoining room surfaces (i.e., in a corner, or near a wall). If possible, experiment with placement before deciding on a final arrangement.

For the best possible stereo performance, the systems should be arranged symmetrically in front of the listener. As a general rule, a person sitting in the usual listening position should be at the apex of a 40° angle to the two systems. The distances between the systems should be determined by their distance from the listener and by the 40° listening angle.

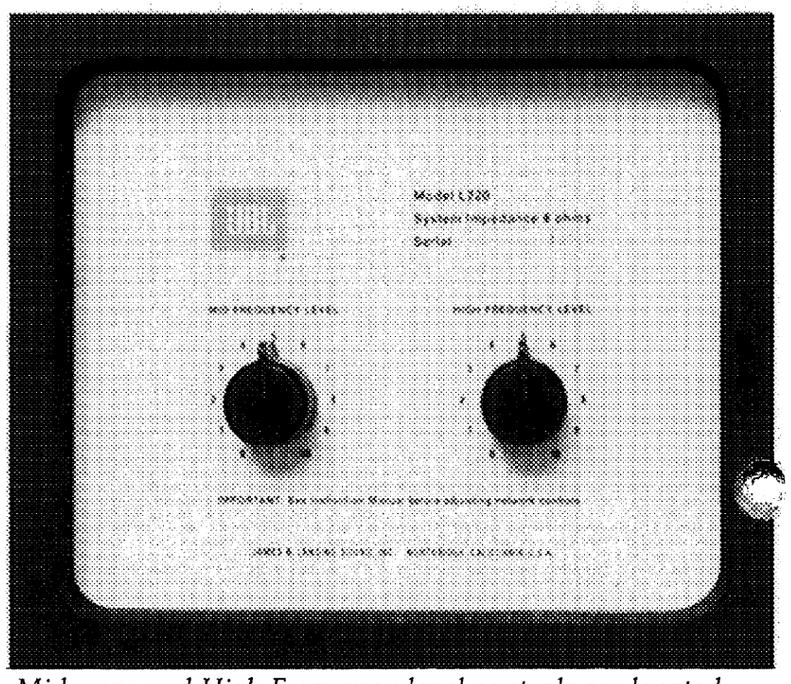


40° Listening Angle
Sound energy from the loudspeaker systems blends to form a stereo "image." This image will be intensified and the area of the best stereo perception increased if the two systems are turned slightly toward the preferred listening position.

ADJUSTING THE SYSTEMS

Although the L220 is designed to ensure maximum flexibility of placement within the listening room, some adjustment will usually be desired to accommodate personal preferences or specific room acoustics. Level controls for the midrange and high frequency drivers are located on the rear panel of the L220 enclosure; the numbers surrounding each control are for reference only. Variations in room acoustics usually result in control settings between 3 and 7. However, the settings could fall outside this range in unusually live or dead rooms. The system should be adjusted while reproducing typical program material, with the amplifier tone controls set at the center (generally referred to as "flat") position. Except as noted, evaluations should be made while seated in the normal listening location. Once all adjustments have been made and the exact placement

of the systems has been determined, compensation for differences in individual recordings should be made with the tone controls on the amplifier or receiver.



Midrange and High Frequency level controls are located on the upper rear panel of the enclosure.

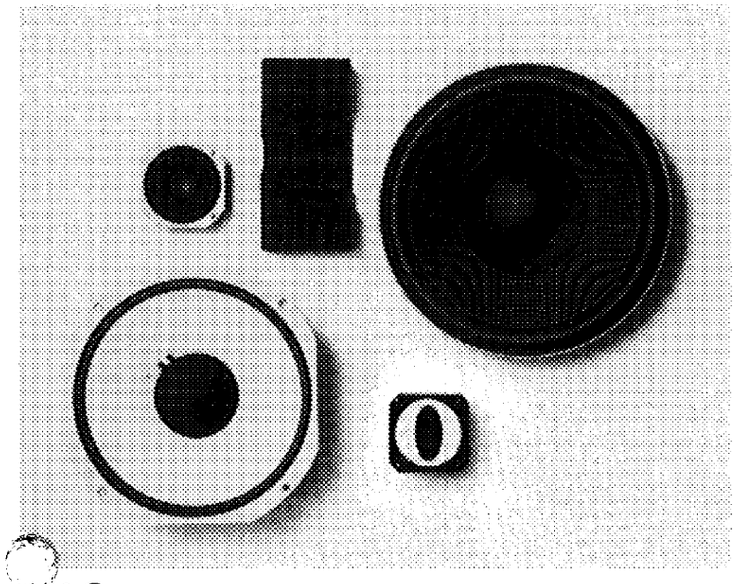
JBL loudspeaker systems are unique in combining high efficiency with the ability to handle large amounts of power. The L220 produces sound at comfortable listening levels when driven by an amplifier having an output of as little as 10 watts continuous sine wave per channel.* However, for reproduction of the full dynamic range of contemporary recordings at high volume, a quality amplifier delivering up to 400 watts continuous sine wave 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 any case, an amplifier should be chosen with an output power rating that is greater than the maximum power that will be used. This margin of reserve power will help ensure that the amplifier will not attempt to deliver more power than its design allows. When overdriven, most amplifiers will clip signal waveforms ("clipping"), a condition of severe distortion which may damage the high frequency radiators in the systems.

**The continuous sine wave rating of amplifier power is the most stringent method currently used in the audio industry. Many amplifier manufacturers use the term "watts rms" as a direct equivalent to the more meaningful "watts continuous sine wave."*

If distortion is heard, one or more of the sound system components is operating beyond its capacity (assuming each component is properly adjusted) and the overall volume level of the sound system should be reduced. In almost all cases, the acoustic level generated by a JBL loudspeaker will become noticeably discomforting to the ear before the loudspeaker can become damaged by excessive power from the amplifier. There is virtually no danger of damaging a JBL loudspeaker if it is operated within the following guidelines: 1) the signal from the amplifier, regardless of its rated power, is not distorted; 2) the amplifier is not driven into clipping; and 3) audio connectors are not inserted or unplugged while the amplifier is operating.

However, a powerful wide-range amplifier can accidentally damage any loudspeaker under certain conditions. For example, fast winding a tape recorder with the playback volume turned up can generate "squeals" powerful enough to burn out the high frequency unit. Similarly, powerful low frequency pulses extending down into the subsonic range can eventually damage the low frequency loudspeaker. If the phonograph pickup is accidentally dropped with the volume control at maximum, or if the system is played very loudly with excessive bass boost, nearly the full rated power of the amplifier can be channeled into dangerous subsonic energy.

Each component of every JBL loudspeaker system is designed and produced by JBL to meet the most rigorous standards in the industry. JBL loudspeaker



L220 Components
380 mm (15 in) Passive Radiator
355 mm (14 in) Low Frequency Loudspeaker
125 mm (5 in) Midrange Loudspeaker
Acoustic Lens
Integrated Elliptical High Frequency Radiator

frames are massive cast structures, produced to exacting tolerances. Magnetic assemblies are precisely manufactured of low-reluctance iron, energized by large, high-grade magnets. Voice coils are held to within one turn of design specifications. Cones are designed for the best possible combination of stiffness, density, and weight. Each component, the enclosure, and finally the system as a whole withstand a series of stringent quality control tests and inspections during assembly.

LOW FREQUENCY—A stiff, heavy 355 mm (14 in) cone, coated with a specially formulated material for better damping and optimum mass, and powered by a low-loss 8.5 kg (18⅝ lb) magnetic assembly, provides the deep, precise low frequency reproduction of the L220. The 100 mm (4 inch) edgewound copper voice coil, unusually large in relation to cone size, helps produce the driver's high efficiency and remarkable transient response.

A 380 mm (15-inch) passive radiator extends reproduction to the lowest portion of the frequency spectrum. The radiator, which has very high compliance and 33% greater area than the low frequency loudspeaker, is capable of high amplitude excursions generating high volume velocity—that is, moving a large volume of air quickly. This provides extremely low-distortion response even at very high acoustic levels.

MIDRANGE—The midrange and high frequency drivers are housed within a separate chamber to prevent interference from the low frequency loudspeaker. The 125 mm (5-inch) midrange loudspeaker is mounted on a sub-baffle behind the main baffle panel. Powered by a 0.74 kg (1⅝-pound) magnetic assembly driving a 22 mm (⅞-inch) copper voice coil, it has both high efficiency and exceptional transient response.

The driver is coupled to an acoustic lens, a refracting waveguide projecting through the baffle panel. This waveguide extends the useful frequency range of the midrange driver over a wider angle as it conducts sound from the recessed transducer to the baffle panel.

HIGH FREQUENCY—Ring radiators, made only by JBL, are high efficiency, extremely high accuracy devices. The 076 Integrated Elliptical Radiator of the L220 is an annular ring diaphragm integrated with two other devices: a constant area phasing plug, which maintains constant phase and amplitude, feeding an elliptical exponential horn, which controls dispersion and sets the radiator's acoustic center back the precise distance from the baffle for correct alignment with the other transducers. The 076 provides efficient, accurate response and wide dispersion to frequencies beyond audibility.

FREQUENCY DIVIDING NETWORK—The frequency dividing network allocates each portion of the audio spectrum to the appropriate component of the loudspeaker system. Ideally, transitions from one loudspeaker to the next should be imperceptible, the output of the drivers should blend smoothly, and the loudspeakers should not interfere with each other. To accomplish these goals, tolerances of JBL network components are much more stringent than general industry practice. For example, the capacitors used are non-inductive types with high AC current handling capability, built expressly for use in dividing networks and individually tested for conformity to rigid performance standards. The special inductors used have extremely low insertion loss so that very little of the essential driving power to the loudspeaker system is dissipated in the network. Each inductor is calibrated on a sensitive electronic bridge, and its value set precisely. The dividing network of the L220 incorporates impedance-leveling and phase-correcting circuitry, ensuring that the system operates in a nearly ideal manner through the crossover frequencies, while attenuating rapidly outside each individual driver's operating range to prevent interference. This complex circuitry and the extended frequency response of the individual drivers give the sound of the L220 its transparent clarity.

SERVICE

Should your JBL loudspeaker system require service, return it to the JBL dealer from whom it was purchased. If this is not possible, write directly to the JBL Customer Service Department, describing the problem as fully as possible. Products returned to the factory must be sent prepaid to JBL Customer Service Department, 8500 Balboa Boulevard, Northridge, California 91329.

COMPONENT REMOVAL

Should it become necessary to remove the loudspeaker system components for testing or repair, turn off the power to the amplifier or receiver, disconnect the loudspeaker system, and follow the described procedures.

All the components (except the grille) are held in place by Phillips-head screws. These screws are threaded into T-nuts on the low frequency loudspeaker, passive radiator, rear panel, midrange loudspeaker, and dividing network, and directly into the components themselves on the acoustic lens and high frequency loudspeaker. When removing the screws, take care not to apply pressure that could dislodge the T-nuts.

GRILLE—The grille is secured to the enclosure by dowel pins located along the edges of the baffle panel. To remove the grille, grasp it by both top or both bottom corners and pull gently. To replace it, reposition it on the dowel pins and press lightly.

LOW FREQUENCY—The low frequency loudspeaker is held in place on the front of the baffle by four screws. Place the enclosure on its back on a clean, padded surface, and carefully remove the screws. Grasp the loudspeaker by the edge of its frame, lift it away from the baffle panel, disconnect the wires at the binding posts, and remove the loudspeaker.

PASSIVE RADIATOR—Because of its inherent simplicity, the passive radiator is unlikely to require service. However, if removal is required, the procedure is the same as for the low frequency loudspeaker, except that there are eight screws and no wires to disconnect.

REAR PANEL—The upper rear panel of the enclosure must be removed to provide access to the midrange and high frequency loudspeakers, and to the dividing network. The enclosure should be upright, and a soft cloth or other padding should be placed on the top to protect the finish. Remove the 10 screws around the edge of the panel, lift it away from the enclosure by supporting it along the edges of the level control recess, and place the panel (with its attached dividing network/level control assembly) on top of the enclosure.

MIDRANGE—Remove the rear panel. The acoustic lens is fastened to the midrange sub-baffle by four screws which must be removed from inside the enclosure. As you take out the screws, support the lens with one hand. The midrange driver itself is attached to the front of the sub-baffle by four screws; remove them, lift the driver away from the panel, and disconnect the wire leads.

HIGH FREQUENCY—Remove the rear panel. The high frequency driver is mounted on the inside surface of the main baffle panel, but the screws must be removed from the front. Support the driver with one hand as you remove the screws. Disconnect the wire leads and lift the driver from the enclosure.

FREQUENCY DIVIDING NETWORK—The dividing network is attached to the rear panel. To remove the network itself, first follow the preceding instructions for removing the low frequency loudspeaker, rear panel, and midrange loudspeaker, and be sure to disconnect the wire leads. The wire leads can be disconnected from the high frequency driver without removing it. The network can then be removed from the rear panel by taking out the four screws around the edge of the level control recess. Pull the disconnected wires from the enclosure.

REPLACEMENT—Reverse the removal procedure to replace the loudspeaker components. Mounting screws should be tightened evenly to avoid the possibility of frame warpage and just enough to prevent air leaks between components and the enclosure. Avoid excessive force.

When replacing the high frequency loudspeaker, be sure that the oval opening is oriented vertically. To re-connect the wire leads, follow the diagram on page 12.

Although JBL loudspeakers are extremely rugged, the cone and other moving parts are subject to accidental damage. Exercise extreme caution when using a screwdriver or other tools in their immediate vicinity.

ENCLOSURE

The L220 enclosure panels are made of dense compressed wood (also known as particle board), superior to solid wood in its acoustic properties. For maximum strength and resistance to vibration, all panels are cut from 19 mm (¾-inch) stock, the structure is extensively braced, and all joints are hand-fitted.

The finish veneer is American black walnut, hand rubbed to a rich, lustrous finish enhancing the natural beauty of individual grain structure and color. Detail work is obvious: materials are carefully selected and skillfully prepared; joints are expertly closed; scratches, dents, gluelines, and other defects are nonexistent. Acoustic damping material is used liberally to attenuate standing waves within the enclosures.

Occasional dusting with a clean, soft cloth will maintain the original beauty of the walnut finish. Since moisture cannot penetrate the oiled surface, most household stains can be removed with a damp cloth. The surface should be treated only with wax specifically formulated for use on oiled finishes. Conventional furniture waxes, polishes, or cleaners are not recommended.

As the oil penetrates deeply into the walnut, the finish may appear to be drying out. Many owners find it desirable to re-oil the enclosure surface from time to time. With each application, the beauty of the finish will become more apparent and a warm, rich patina will eventually be obtained.

To re-oil a JBL finish, use any one of the several clear oil finishing preparations available through furniture or hardware outlets. Apply a liberal amount of the preparation over the entire finished surface of the enclosure. In ten to fifteen minutes wipe off the remaining oil with a soft, clean, dry cloth. Small surface scratches can usually be removed by gently rubbing them out with very fine steel wool (4/0 grade) and applying oil to the entire panel. When using steel wool, apply light pressure and rub only in the direction of the grain. Very deep scratches, dents, or other serious damage should be repaired only by a qualified furniture refinisher.

Caution: Improper storage of wiping rags could result in spontaneous combustion. They should be spread out to dry in a well-ventilated area before storage or disposal.

The grille cloth can be cleaned by gentle dusting with a vacuum cleaner. Stains can be removed by using a soft bristle brush moistened with mild soap and water. Do not use any cleaning fluids or solvents of any kind, as they could damage the grille.

SUMMARY

The L220 exemplifies JBL's reputation for leadership in acoustic and visual design. It is our sincere belief that the L220—like all JBL products—will provide undiminished listening pleasure for many years to come.

Like all fine loudspeaker systems, the L220 will reveal the quality of program material as well as the quality of the other components in your music system. It is recommended that you choose every component for its ability to provide a standard of performance, quality, and reliability comparable to that of your JBL loudspeakers. The reward will be a level of enjoyment of the highest order.

FOR ADDITIONAL INFORMATION

If you have difficulty in achieving the fine performance of which your JBL loudspeaker system is capable, consult the franchised JBL dealer from whom the system was purchased. He is equipped with the knowledge required to provide expert advice and assistance. If for some reason the JBL dealer is unable to assist you, write directly to the JBL Technical Services Department, explaining the difficulty in detail.

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 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.

Low Frequency Loudspeaker		
Nominal Diameter	355 mm	14 in
Voice Coil	100 mm (4 in) copper	
Magnetic Assembly Weight	8.5 kg	18⅝ lb
Flux Density	1.2 tesla (12,000 gauss)	
Sensitivity[1]	91 dB SPL, 1 W, 1 m (3.3 ft)	
Midrange Loudspeaker		
Nominal Diameter	125 mm	5 in
Voice Coil	22 mm (⅞ in) copper	
Magnetic Assembly Weight	0.74 kg	1⅝ lb
Flux Density	1.4 tesla (14,000 gauss)	
Sensitivity[2]	93 dB SPL, 1 W, 1 m (3.3 ft)	
High Frequency Ring Radiator		
Horn Mouth	64 mm x 32 mm	2½ in x 1¼ in
ersion[3]	90° horizontal, 45° vertical at 12 kHz	
Magnetic Assembly Weight	1.5 kg	3¼ lb
Flux Density	1.65 tesla (16,500 gauss)	
Sensitivity[4]	105 dB SPL, 1 W, 1 m (3.3 ft)	
System		
Maximum Recommended Amplifier Power	400 watts per channel	
Nominal Impedance	8 ohms	
Crossover Frequencies	800 Hz, 5 kHz	
System Sensitivity	90 dB SPL, 1 W, 1 m (3.3 ft)	
General		
Finish	Oiled walnut	
Grille Colors	Brown, tan[5]	
Dimensions	1225 mm x 512 mm x 390 mm deep 48¼ in x 20⅛ in x 15⅜ in deep	
Net Weight	51 kg	112 lb
Shipping Weight	58 kg	128 lb

1. Averaged from 100 to 500 Hz, within 1 dB.
2. Averaged from 1 kHz to 3 kHz, within 1 dB.
3. The angle through which output diminishes no more than 6 dB relative to output on axis.
4. Averaged above 5 kHz, within 1 dB.
5. A brown grille with a cutout for the lens is available separately.

LOUDSPEAKER WIRING DIAGRAM