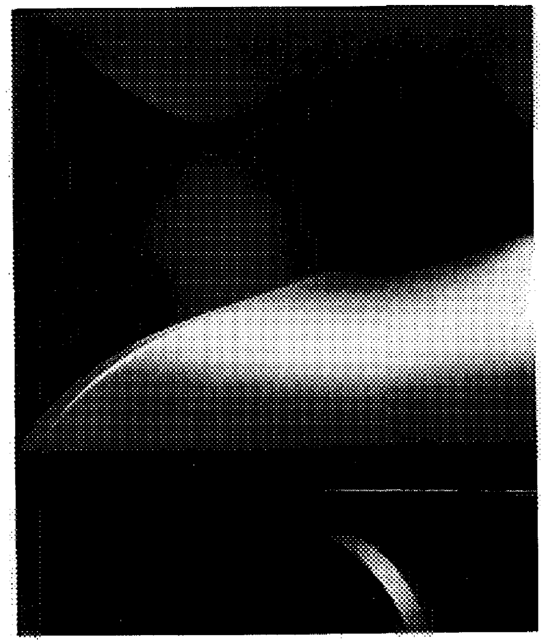
DD55000 INSTRUCTION MANUAL



Contents:

The DD55000 Loudspeaker System

The advent of digital recording has focused attention on stereo imaging to a greater degree than before. Not only are recording engineers concerned with left-right imaging, but fore-aft relationships as well. Another characteristic of modern digital recordings is their high peak-to-average ratios, which place increased demands on both electronics and loudspeakers.

The DD55000 system has been designed to solve two basic problems in modern sound reproduction. First, it provides accurate stereo imaging over a very wide listening area. Listeners seated off axis will perceive as clear a stereo image as listeners seated on axis. Second, the DD55000 system has very high sensitivity and power handling capability. It can thus accommodate the largest of today's amplifiers safely. In cases where a modestly powered amplifier has been chosen because of sonic attributes, the full dynamics of the recording are preserved.

The system features horn loaded midrange and high frequency elements, and the enclosure is the most massive JBL has ever constructed.

Placement and Adjustment:

The DD55000 consists of a mirror imaged pair of loudspeakers, and it is essential that the loudspeakers be used for their specific channel assignments.

JBL normally recommends that a listening angle between 40 and 60 degrees be used for stereo. With the DD55000 system, the listening angle can be increased, if desired, up to 80 degrees for wide-stage stereo.

Placement is not critical. Corner placement works well, inasmuch as the controlled radiation from the loudspeakers will cause minimal reflection from the adjacent side walls.

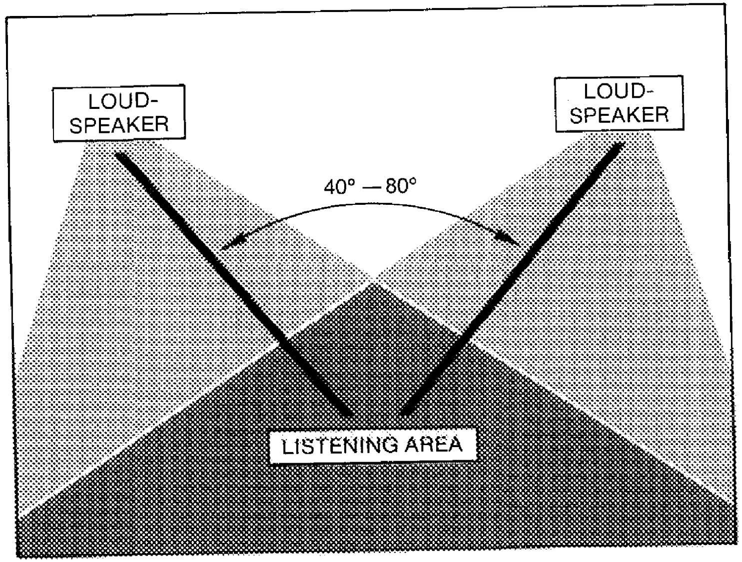


Fig. 1.
40° to 80° listening angle.

Begin the setup by adjusting the attenuators on the front of the loudspeakers to their normal (0 dB) positions. Then, put on a recording which has a clearly defined vocal phantom center image.

While the record is playing, move off center, noting the center image position. For small distances from the center line, there will be little shift in the center image. With greater distances from the center line, the image may tend to shift. If the image shifts toward the farther loudspeaker (referred to as over-steering), then the loudspeakers should be slightly angled inward so that the level from the farther loudspeaker is reduced somewhat at the new listening position. Generally, turning the loudspeaker slightly inward will correct the problem, since the listener will then be farther off the major axis of the more distant loudspeaker. Slight changes will suffice in making these adjustments. If the system should under-steer, then the loudspeakers should be angled slightly outward, again by small amounts, until the desired effect is obtained. When the loudspeakers are in exactly the right orientation, center stage images will remain properly localized over a wide listening area.

Electrical Adjustments:

The mid-range level control may be adjusted by the user to suit his or her general listening preference. The mid bass attenuator, located behind the access door in the rear of the enclosure, may be used to fine tune the system balance in various rooms. Often, with corner placement, there will be a tendency for response to build up in the 100 to 300 Hz range, and the mid bass attenuator may be used to alleviate this.

The setting of the ultra-high-frequency (UHF) level control should be made while listening in an off axis position. Set the mode switch on the preamplifier to mono, and play a recording which has considerable transient information. The UHF controls should both be set to the same value, and that value should be the one which tends to keep the transient information toward the middle of the stereo stage. This is a rather subtle adjustment, and there are only three positions on the UHF control. Do not be concerned if the sound image does not steer precisely toward the middle. Overall, it is the effect on stereo center information and its relation in the broad stereo stage perspective which we are concerned with.

Connections:

The binding posts on the rear of the DD55000 loudspeakers will accept most types of audio cable and connectors, including banana plugs. They will also accept bare wire.

For each channel, connect the red terminal on the loudspeaker to the red, "positive," or "+" terminal on your amplifier. Connect the black loudspeaker terminal to the black "ground," or "−" terminal of the amplifier. Connecting the loudspeakers in this manner will ensure that they are electrically in phase. This will generally be the connection which ensures that the system is in overall "absolute" polarity.

Grilles:

Loudspeaker grilles are a complement to the details of enclosure construction and baffle and transducer layout. However, many serious listeners prefer to operate loudspeakers with the grilles removed, inasmuch as even the most acoustically transparent material will attenuate HF information to some degree. We leave it to the user to decide for himself.

Service:

Should your DD55000 loudspeakers require service, contact the JBL dealer from whom you bought them. If this is impractical, write or call the JBL Service Department, describing the problem in detail. Address correspondence to JBL Customer Service Department, 8500 Balboa Boulevard, Northridge, California 91329, U.S.A. (818) 893-8411. Products should not be returned to the factory without prior authorization.

Theory of Operation:

The constant imaging properties of the DD55000 system result from the asymmetrical horizontal coverage patterns which the two loudspeakers produce. The offset angle of the LF transducer is 30 degrees, and that of the UHF transducer is 60 degrees. The coverage pattern of the MF horn varies from wide, directly in front of the loudspeaker, to narrow, as the listener moves off axis.

For a listener seated equidistant between these, or any other loudspeakers, stereo imaging tends to be quite accurate. However, with conventional loudspeakers, as the listener moves off axis, the stereo stage becomes skewed toward the closer loudspeaker. The reason for this is that the sound from the nearer loudspeaker is louder and arrives at the listener's ears earlier. Both of these cues favor localization at the nearer loudspeaker, and the stereo stage is skewed accordingly.

With the DD55000 system, an off axis listener will be positioned along a zone of higher sensitivity for the loudspeaker farthest away from him. Therefore, the level differences due to unequal path lengths can be compensated. Rotating the loudspeakers in or out, as needed, enables the effect to be fine tuned for nearly any listening environment.

In addition to correcting for the path length difference in level from the loudspeakers, there is the additional effect of time delay. The nearer loudspeaker will, of course, arrive at the listener's ears a few milliseconds before the farther loudspeaker does, and this extra cue, known as the precedence, or Haas, effect, tends to focus our attention on the nearer loudspeaker. This effect is largely operant at high frequencies, and the angular orientation of the UHF transducer was optimized with this effect in mind. Additional control over the level of the UHF transducer enables the effect to be fine tuned for each environment.

Figure 2 shows system frequency response taken on-axis to the midrange horn throat in a 2 pi environment. The dashed line represents the effects of 4 pi loading on low frequency response. Figure 2 also shows the system impedance curve.

Figure 3 shows the output of the three dividing network sections. The effects of the midbass control and the three position midrange and UHF level controls are also shown.

Figures 4 through 9 are polar graphs for the left loudspeaker taken on octave centers from 500 Hz to 16 kHz as indicated. It is clear from examining these graphs that the off-axis response increases for a listener who moves further away from the left loudspeaker, thus maintaining a stable center image. The polar graphs for the right loudspeaker are the mirror image of the ones shown.

Additional Technical Information:

In addition to its special attributes of constant imaging and high sensitivity, the DD55000 system is very much in the JBL traditions of fine workmanship and uncompromising engineering. All transducers are made of cast outer structures, and all voice coils are wound of flat ribbon wire.

The LF transducer is a new design which combines high sensitivity and power handling capability with extremely smooth off axis response. Obviously, there is no single "on axis" position for measuring the DD55000 system, since it is intended that listeners can be positioned over a relatively large horizontal arc.

The MF driver features a titanium diaphragm for greater fatigue resistance and extended HF output. The MF horn itself is a unique design from JBL's Bi-Radial family of horns.

The UHF ring radiator is one of JBL's most enduring components and finds wide application in many professional applications where high amounts of UHF sound output are required.

The dividing network makes use of the finest components, including bypass capacitors for high definition HF response.

The enclosure is especially rugged and well braced, with walls of 38 mm (1½ inches) thickness in some sections.

Specifications:

System:

Maximum Recommended Amplifier Power:	250 watts per channel
Nominal Impedance:	8 ohms
Crossover Frequencies:	850 and 7500 Hz
System Sensitivity:	100 dB SPL, 2.83V, 1 m (3.3 ft)

Low Frequency Transducer:

Model:	150-4H
Nominal Diameter:	380 mm (15 in)
Voice Coil Diameter:	100 mm (4 in) edgewound copper ribbon
Magnetic Assembly Weight:	10.3 kg (22¾ lb)
Flux Density:	0.95 T (9,500 gauss)
Sensitivity:	98 dB SPL, 1 W, 1 m (3.3 ft)

Mid Range Horn/Driver:

Models:	2425H driver and 2346-1 horn
Voice Coil Diameter:	45 mm (1¾ in) edgewound aluminum ribbon
Magnetic Assembly Weight:	4.5 kg (10 lb)
Flux Density:	1.8 T (18,000 gauss)
Sensitivity (on driver axis):	110 dB SPL, 1 W, 1 m (3.3 ft)

Ultra High Frequency Transducer:

Model:	2405H
Voice Coil Diameter:	45 mm (1¾ in) edgewound aluminum ribbon
Magnetic Assembly Weight:	1.9 kg (4⅛ lb)
Flux Density:	1.75 T (17,500 gauss)
Sensitivity:	105 dB SPL, 1 W, 1 m (3.3 ft)

General:

Dimensions:	141 cm x 92 cm x 51 cm (55½" x 36" x 20")
Net Weight:	145 kg (320 lb)
Shipping Weight:	209 kg (460 lb)

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 will always equal or exceed the original design specifications unless otherwise stated.

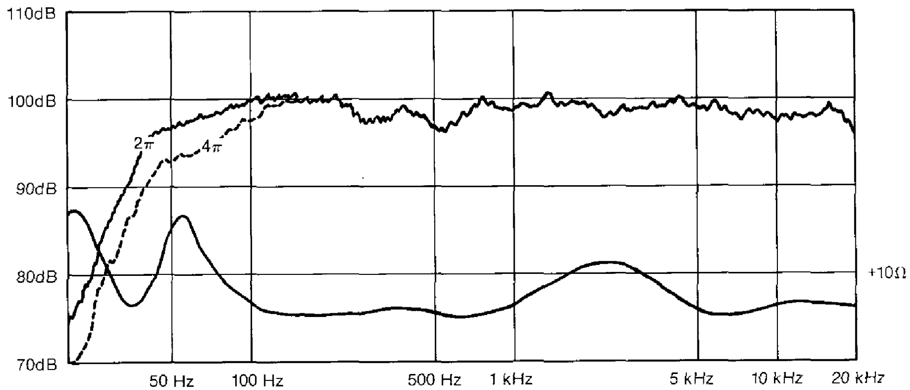


Fig 2.
Ground plane measurement of Everest system. Curve shows response in half-space. The dashed line represents 4 pi (anechoic) loading. The lower curve represents system impedance.

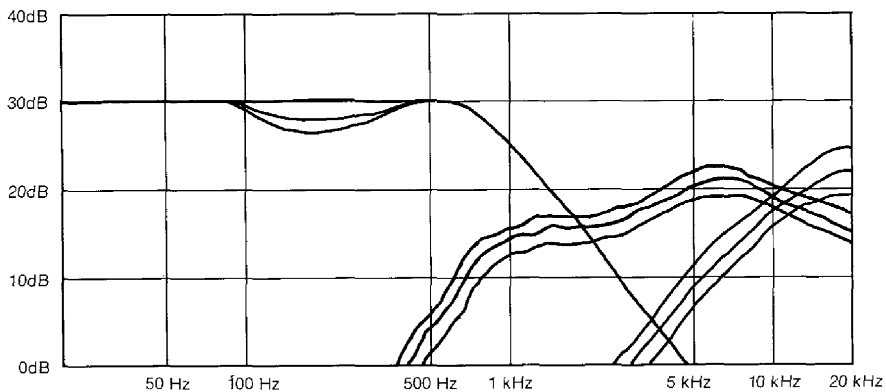


Fig 3.
Voltage drive curves at network output. Action of controls is shown.

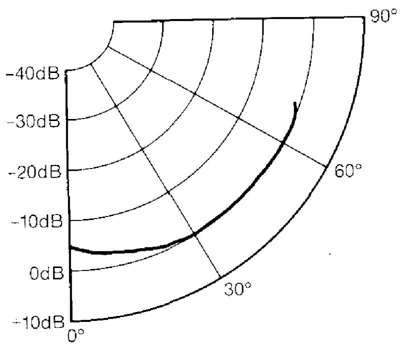


Fig 4.
Polar response of left system at 500 Hz

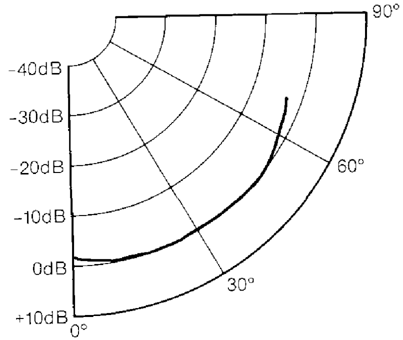


Fig 5.
Polar response of left system at 1 kHz

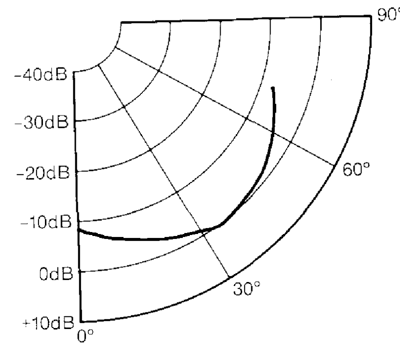


Fig 6.
Polar response of left system at 2 kHz

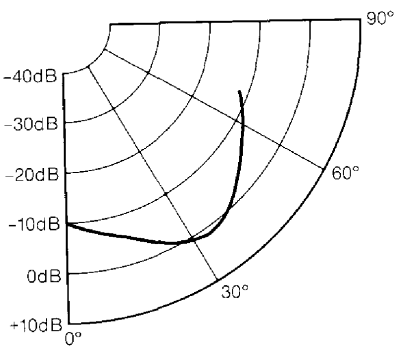


Fig 7.
Polar response of left system at 4 kHz

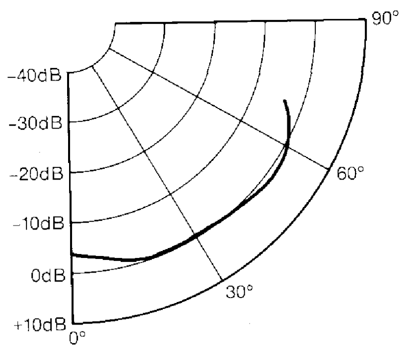


Fig 8.
Polar response of left system at 8 kHz

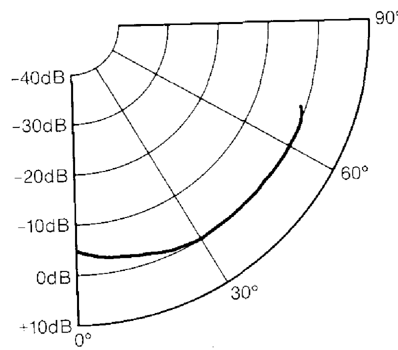


Fig 9.
Polar response of left system at 16 kHz