2 unit 2-way system **D001** *which includes:*

signature

JBL *Signature* Koustical Lens assembly 175DLH made up of a high frequency driver, exponential horn, and diffusion lens which radiates undistorted highs evenly over a solid 90° angle. The Koustical Lens operates on principles never before incorporated in a manufactured unit and made available to the audiophile. It is not to be confused with the ordinary "tweeter." Nominal impedance is 16 ohms; power input, 25 watts above 1200 c.p.s.; field is a permanent magnet; index of refraction is 1.3; diameter of horn throat is 1"; mounting hole diameter 5⅜"; overall length 11½"; shipping weight 12 pounds.

Dividing network N1200, a 3 position high frequency attenuation switch with a nominal impedance of 16 ohms, crossover at 1200 c.p.s. Has attenuation of 12 db per octave.

15" low frequency speaker No. 130A. The 4" voice coil of this unit assures smooth, clean lows of unmatched fidelity. Nominal impedance, 16 ohms; power input, 25 watts; permanent magnet field; resonant frequency, 36 cycles; outside diameter 15-13/16"; depth 5⅝"; shipping weight, 23 pounds.

General purpose speakers

12" D131

15" D130. Rated at the top by many independent agencies for its crisp response across the entire audio frequency band. A 4"-diameter voice coil of edge-wound aluminum ribbon is subjected to intense magnetic flux, which is efficiently conducted from a permanent magnet. Power input, 25 watts; impedance, 16 ohms. Dimensions: 15$^{5}/_{16}$" OD x 5⅜" depth. Weight: 23 lbs.

12" D131. The same quality—the same design and construction as Model D130. Differs only in the smaller dimensions of frame and cone. The finest 12" speaker made anywhere.

12" D123. Amazing fidelity from a 12" speaker of new shallow design. Features a 3"-diameter voice coil of edgewound aluminum ribbon. Power input, 20 watts; impedance, 16 ohms.

15" D130

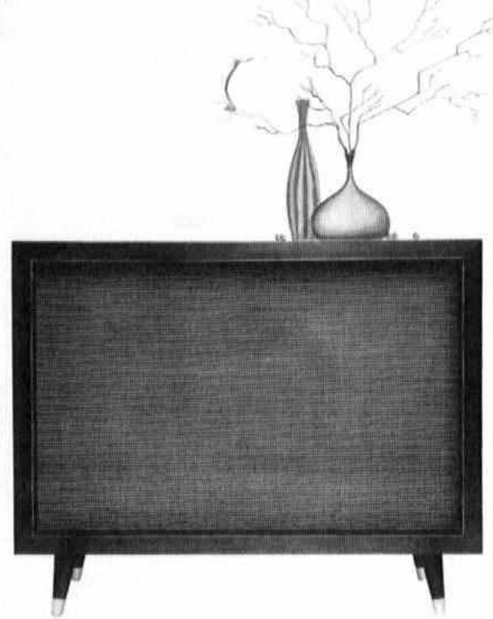
12" D123

High Frequency Ring Radiator **075**

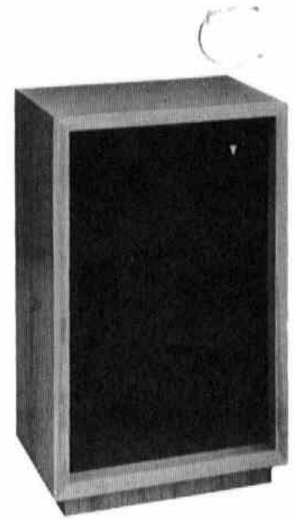
The newest member of a distinguished family, this extremely efficient transducer adds brilliance and dimensionality to the performance of general purpose speakers and is particularly recommended for use in the more absorbent home rooms, where the highs are selectively attenuated. Radical new principle permits the closest possible approach to piston action from a 2500 cps crossover to a point beyond the limit of human audibility. N2600 Dividing Network has built-in HF volume control, so that 075 can be balanced with single or multiple general-purpose speaker installations.

JAMES B. LANSING SOUND, INC.
3249 Casitas Ave.
Los Angeles 39, Calif.

CONSTRUCTION FOLDER CF-702
PRINTED IN U.S.A.



MODEL 37 *Lō Boy*

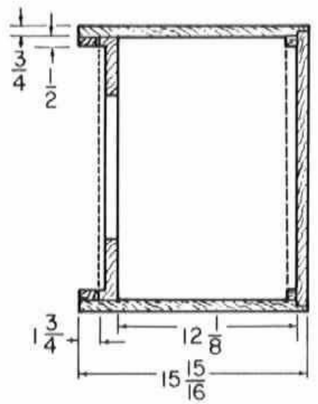


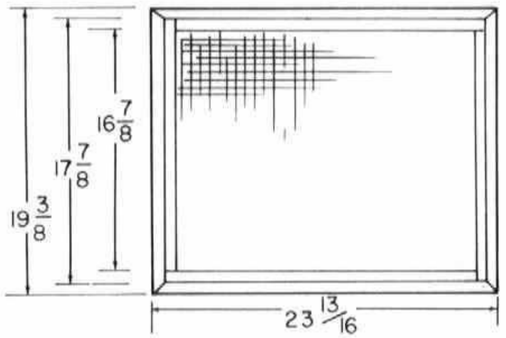
MODEL 35 *Console*

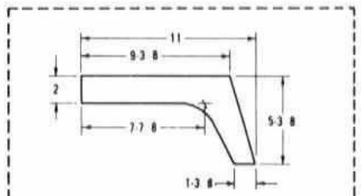
MODEL 39 *Multiple/Reflex*

MODEL 38 *Lō Boy*

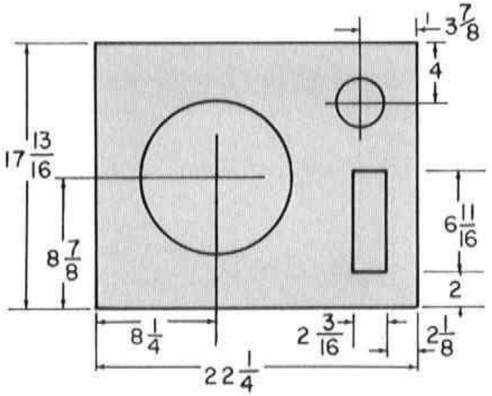
signature





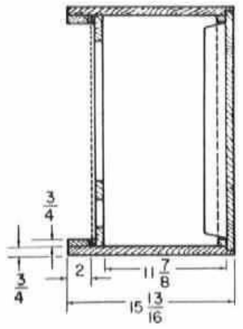


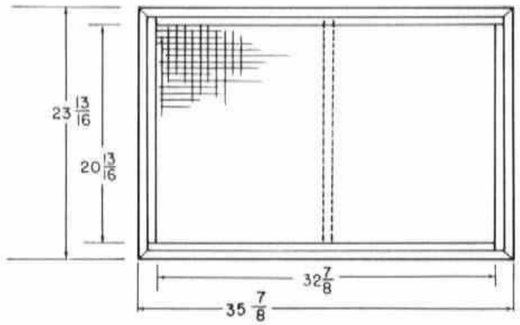
"Do-it-yourself" legs for Model C36 Enclosure. Cut four; mount diagonally.

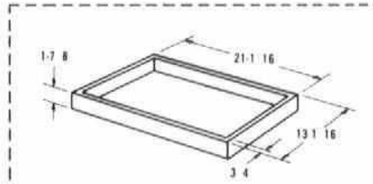


These minimum-volume reflex enclosures will accommodate a variety of loudspeaker components. Model C36 is an upright enclosure which uses the diagonal legs shown here. Model C38 is a lowboy version of the same enclosure which uses tapered wooden legs. Two of these reflex units with appropriate loudspeakers installed make an excellent space-saving stereo speaker installation.

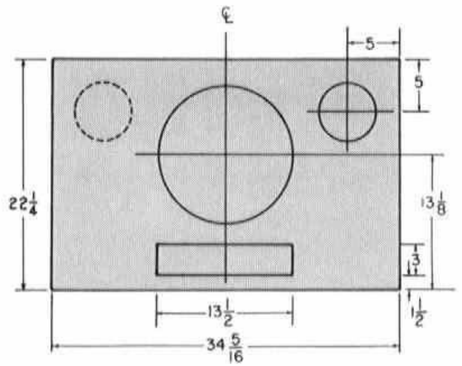
Detailed blueprints and assembly instructions for the C36 and C38 are available at nominal cost through your authorized JBL dealer.



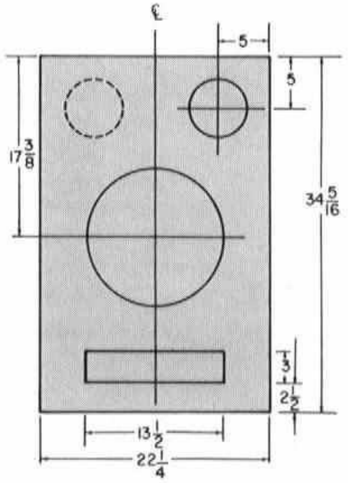




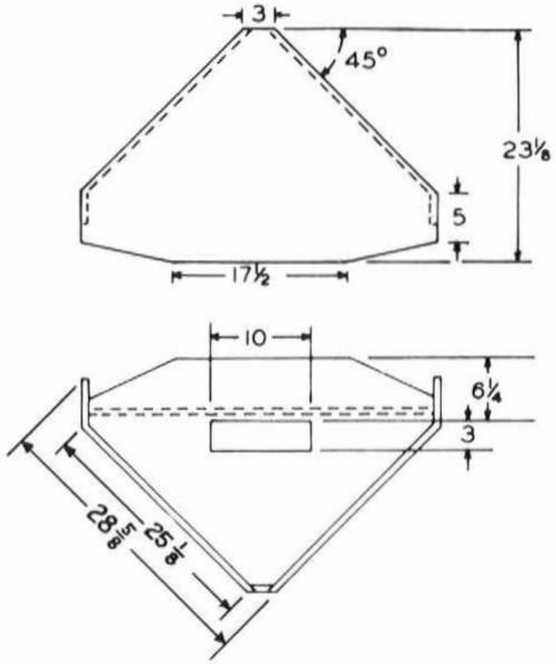
Toe kick for Model C35 Enclosure.



The C37 lowboy and C35 console enclosures are shown in the photographs on the cover of this publication. As indicated by the dotted circles on the baffle layouts above, the high frequency mounting hole may be located on either side of the cone speaker. When building two matching enclosures for a stereo system, the high frequency transducer can be mounted to the right in the right-hand cabinet, and to the left in the left-hand cabinet. In this way, optimum separation of sound sources can be achieved with close spacing of the enclosures.



Detailed blueprints and assembly instructions for the C35 and C37 are available at nominal cost through your authorized JBL dealer.



Grille Frame

Detailed duplication of the exterior styling which characterizes this sturdy corner enclosure is a project recommended only to experienced woodworkers. The bevel cuts which give the "sculptured" effect to the top and bottom panels require a duralloy blade operated with considerable skill. Veneer strips are glued to the edge surfaces with grain perpendicular to the long edge lines. The baffle shown is one of two designs adopted to accommodate the numerous speaker systems which can be used in this enclosure. The second design is for 12-inch speakers only and provides for installation of up to four of these units.

Detailed blueprints and assembly instructions for the C39 are available at nominal cost through your authorized JBL dealer.

general construction notes

1. ¾" plywood is used for all panels. First assemble the top, bottom, and sides. Then fit the scabs inside the front opening. Finish the exposed edge with molding, veneer, or lacquer.

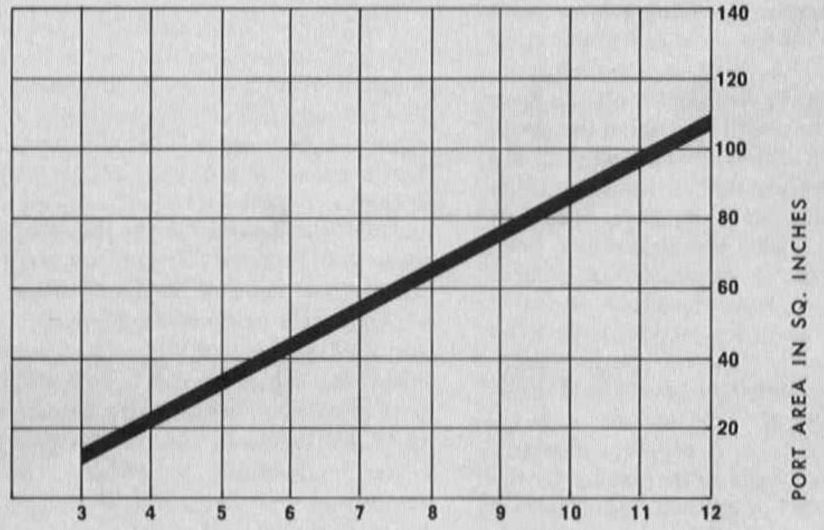
2. Cut the speaker baffle for the loudspeakers which will be installed. If you plan to add a high frequency unit later, cover the unused hole with a plywood block screwed down tight. Stretch and tack grille cloth over the front of the baffle after painting it black. Fasten the completed baffle to the inside edge of scabs with wood screws every four inches.

3. Acoustical Fiberglass padding one-inch thick is tacked inside back, bottom, and sides of the enclosure.

4. JBL dividing networks can be mounted on the back of the enclosure in a position which won't interfere with loudspeaker placement. A hole 4¼" x 5½" should be cut in the back panel. If the JBL N1200 is used, it is mounted inside the hole on two blocks 4⅜" x 7½" x ¾".

This chart gives mounting hole diameters for JBL cone loudspeakers and high frequency transducers.

8-inch speaker	7"
12-inch speaker	11"
15-inch speaker	13½"
175DLH	5⅜"
075	3 3/16"



INTERNAL VOLUME OF CABINET IN CUBIC FEET

If you make a reflex enclosure in which to mount JBL speakers with dimensions other than those shown here, the correct port size can be found on the above chart after you have calculated the cubic content.

A Loudspeaker Needs an Enclosure

If you lay a loudspeaker on a table and feed a low frequency signal into it, you will see the cone vibrate but will hear no sound.

There are two reasons why this is so:

1. At very low frequencies, the cone is not large enough in diameter to couple its energy to the air.

2. All sound that is generated by a loudspeaker is produced with equal intensity by both sides of the cone. When one-half the length between sound waves is approximately equal to the diameter of the speaker, radiations from the rear side of the cone combine with radiations from the front side of the cone. Since they are out of phase, they tend to cancel each other.

The first problem (coupling) can be solved in several ways, all of which have their advantages and disadvantages. The cone can be made larger in diameter. Beyond a certain point, however, the disadvantages outweigh the advantages. The effective diameter of the "piston area" may be increased by using two or more speakers to reproduce exactly the same frequencies. This is a common solution, but is expensive because multiple low-quality speakers will not solve the problem; they are still subject to many of the same shortcomings that are apparent when used as single units. Another approach would be to make the cone move back and forth (linear excursion) a greater distance. Here again, the problems introduced offset the gains made. As evidence of this, there is no unit commercially available to adequately satisfy this coupling requirement. The speaker may be mounted in a horn. A properly designed horn operates in the same manner as the flared horn used in musical instruments—a relatively small sound source being coupled to the large air mass in the bell. One objection to a horn is that it is difficult and expensive to build.

The second problem mentioned above—cancellation—may be solved in several ways. The speaker may be mounted in a large, flat, "infinite" baffle so that back radiations are physically prevented from combining with front radiations. Speakers are sometimes mounted in the wall of a room. This eliminates the cancellation effect, but low-end reproduction is in general far from satisfactory. Mounting a speaker in a completely airtight cabinet of *adequate* volume which is lined with an absorbent material accomplishes the same result; but adequate low-end response is still lacking. Mounting a speaker in a totally enclosed cabinet of *inadequate* volume merely adds an additional bad feature. The stiffness of the sealed-in air drastically affects the cone movement, and at the resonant point produces a bump in the response. Contrary to widely-published opinions, most modern efficient loudspeakers are not designed to operate well in an infinite baffle installation.

Theory of Bass Reflex . . .

The bass reflex cabinet, sometimes called a "phase inverter," is a practical solution to both the problems mentioned at the beginning of this discussion. It is a strong, large cabinet with airtight joints, and a baffle for mounting the speaker or speakers. A port—a hole of carefully calculated dimensions—is cut into the baffle close to the speaker. The energy produced by the back side of the cone excites the air contained within the cabinet. By basic physical principles, the air so excited within the cabinet moves in and out of the port in exact phase with the sound generated by the front side of the cone. By correctly designing the reflex enclosure, movement of air in and out of the port can be made to take place at a point where the loudspeaker, without help, is incapable of coupling its energy to the air.

The reflex cabinet does three things. First, it prevents radiations from the rear of the cone from canceling those produced on the front. Secondly, radiations from the port, since they are in phase with front radiations, reinforce the low notes by providing a second sound source. Thirdly, when the loudspeaker begins to cause air to move in and out of the port, it is being forced to do work. This *loads* the speaker far better than does the infinite baffle. Because of this loading the speaker cone is generally moving no further back and forth at 40 cycles than it is at 150 cycles. In an infinite baffle the cone must move many times as far at 40 as it does at 150 cycles in order to produce tones of the same loudness. Low note fundamentals are reproduced at much greater volume and with far less distortion in a properly designed reflex enclosure than they are with the same speaker mounted in an infinite baffle.

It is impossible to give specific dimensions and instructions for building the proper reflex enclosure for all types and makes of cone loudspeakers. Enclosures described here are designed for use with units manufactured by James B. Lansing Sound Inc. For other loudspeaker mechanisms, the specific advice of the manufacturer should be obtained in order to achieve satisfactory results.

General considerations of Bass Reflexes . . .

When balancing results against ease of construction, it can be seen that the reflex enclosure is the type most practical for building in the home workshop. Though straightforward in construction, it must be built well. Dimensions must be reasonably accurate, joints must be true and tight. Lock-mitre joints, glued under clamps, are ideal if you have access to mill-working machinery. Otherwise all joints should be reinforced with glue blocks running the entire length of the joint. Glue blocks should be screwed at four-inch intervals to each surface.

The interior of the enclosure should be padded with any soft absorbent material. It must, however, be 1" in thickness. If rockwool or a similar material is used, it should be covered with cloth to prevent contamination of the loudspeaker itself. The padding should be applied to two-thirds of the interior surface. Most satisfactory performance is generally achieved by arranging the padding so that a padded surface faces a bare surface of the other side of the enclosure. The optimum size of reflex enclosures for 12 and 15 inch speakers is between 6 and 12 cubic feet. For 8 inch speakers, good results may be obtained with as little as 3½ cubic feet.

The most important single factor in constructing a reflex enclosure is to eliminate all possibility of vibration or movement of the walls of the cabinet itself. In an experimental enclosure, which differed from the specific dimensions shown herein, the best method of achieving this rigidity is to first construct the cabinet without attempting to predetermine the interior bracing that may be necessary.

After the cabinet has been built, mount the loudspeakers and operate them from your power amplifier on some program material having good low notes. The volume control should be adjusted so as to be as high, or higher than you would ever normally use as a listening level. Then run your hand over the entire outside surface of the enclosure and note any areas which move or vibrate in the slightest degree. You must then install sufficient bracing or strengthening on the inside of the enclosure, so as to prevent this movement. It may be necessary to go through this procedure more than once in order to achieve satisfactory rigidity. When this has been done the enclosure will provide its optimum response, and, particularly, response at a very low level will be benefited by its rigidity.