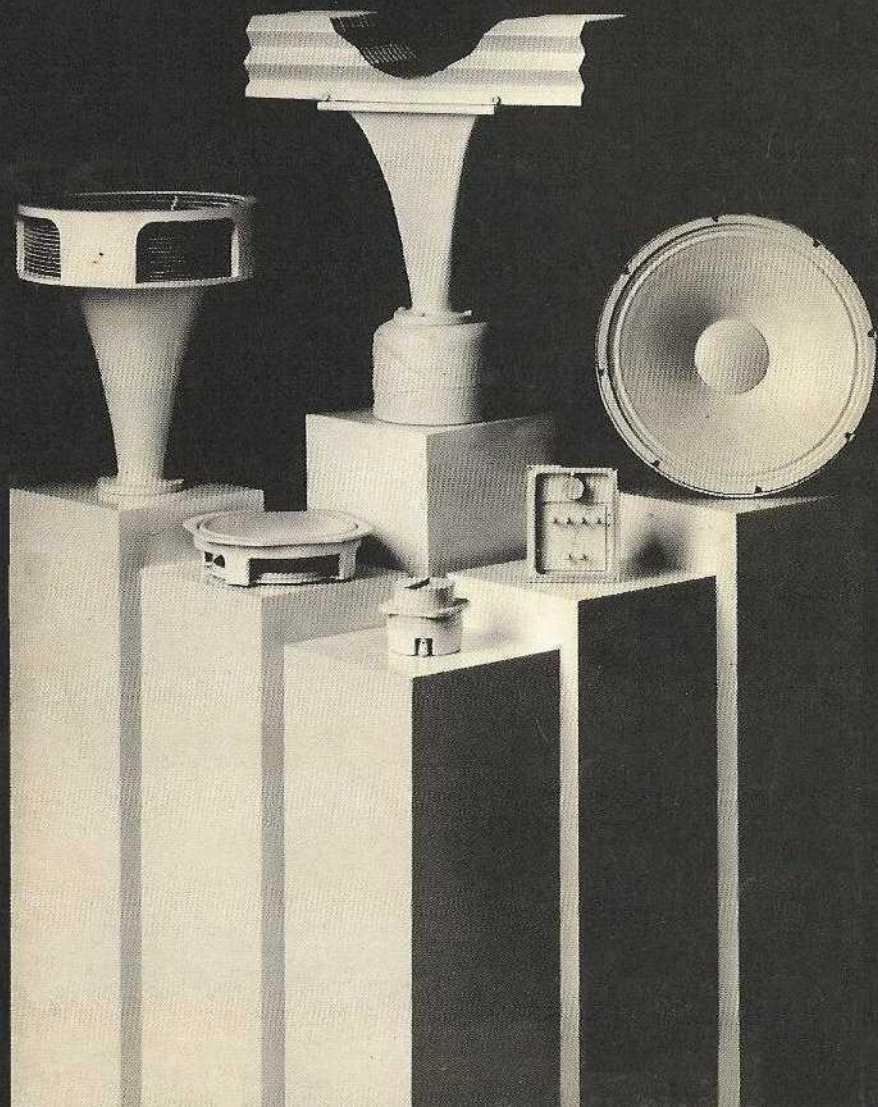


JBL
Loudspeaker Component Series
Instruction Manual



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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.

Excellence is an elusive quality. It's so easy to recognize yet so difficult to attain.

JBL craftsmen have been involved in the art of sound for more than a generation—signal and source, wood and fabric, transducers and acoustics—all of it.

Today these craftsmen continue to perform to the most rigid standards any craftsman can submit to: those they impose upon themselves.

JBL loudspeakers are carefully engineered instruments, painstakingly crafted and assembled to watchmakers' standards. JBL enclosures express the excitement of creative design; they are elegant, solid and flawlessly finished. JBL transducers and electronics offer what has been characterized by devoted music listeners as the "incomparable JBL sound."

By following the few simple suggestions contained in this booklet, you can look forward to superb high fidelity reproduction that will retain its clarity and realism year after year.

Introduction

Every JBL loudspeaker system is the product of extensive listening evaluation combined with exhaustive research and testing, using the most sophisticated equipment and methods available. JBL system recommendations are based on subjective evaluation of component performance as well as efficiency and electrical characteristics. These and other critical factors must be integrated by a frequency dividing network engineered for the specific components of the system.

A well-built, sturdy enclosure is essential for optimum bass performance. An enclosure having the proper internal volume and tuning for the loudspeaker increases low frequency dynamic range and improves tonal quality; it also reduces distortion and the possibility of overdriving the loudspeaker.

Detailed guidance on enclosure construction may be obtained from your JBL Loudspeaker Components dealer who may also supply the JBL Enclosure Construction Kit. An illustrated brochure with a discussion of loudspeaker theory as well as detailed enclosure construction tuning and finishing instructions for home entertainment and musical instrument applications is contained in the kit. Actual construction drawings and "Loudspeaker Components by JBL" nameplates for your finished enclosures are also included.

JBL transducers are precision instruments responding with high accuracy to the variations in electrical current produced by other components in the music system. Extraneous noises, such as hum, rumble, crackling or hissing do not originate in the loudspeakers. If you experience difficulty realizing the fine performance built into your JBL components, consult the JBL Loudspeaker Components dealer from whom they were purchased. He is equipped with the knowledge required to provide expert advice and assistance. If, for some reason, your JBL dealer is unable to assist you, or you cannot find the answer you need published in JBL literature, write directly to the JBL Technical Services Department describing the difficulty in detail; please be certain that your return address and telephone number are clearly printed on your correspondence.

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 continuous sine wave 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 continuous sine wave 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 continuous sine wave per channel. 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, a condition of severe distortion which is particularly dangerous to high frequency radiators.

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 (another form of distortion which occurs when the power output limitations of the amplifier circuitry are exceeded); and 3) the power cord or 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, rewinding 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 full up, 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.

Amplifier Connection

Important: When connecting or disconnecting an extended or full range loudspeaker, or a complete loudspeaker system from an amplifier, the amplifier must be turned off. Making connections while the amplifier is operating could seriously damage the loudspeakers and void the warranty.

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

For connections up to 15 m (50 ft), 1 mm (#18 AWG) insulated wire (ordinary household lamp cord) is the minimum size recommended. For longer distances, we recommend the following minimum sizes: 1.3 mm (#16 AWG) up to 30 m (100 ft), and 1.6 mm (#14 AWG) up to 60 m (200 ft). If lamp cord is used, wires can be differentiated by noting that one of the insulating jackets is smooth, while the other has a distinct ridge.

Locate the loudspeaker output terminals on the back of the receiver or power amplifier. For each loudspeaker system, connect the "black" wire to the amplifier output terminal labeled "common," "ground" or (-), and the "red" wire to the remaining 8-ohm speaker output. The specified 8-ohm impedance rating is a nominal figure which suggests a connection giving the most efficient power transfer between amplifier and loudspeaker system.

Note that many amplifiers have a chassis grounding terminal which is usually separated from the other connectors. This should not be confused with the "ground" designation sometimes used to describe one of the two terminals for each loudspeaker connection.

Bass Loudspeakers

It is good practice to keep a loudspeaker in its original carton or placed face down on a clean surface until installed in order to prevent accidental cone damage. The aluminum center dome of an extended range loudspeaker is particularly fragile and should not be touched. A grille on the front of the enclosure will restrain the curious once the loudspeaker system is complete.

Mounting In An Enclosure Widest sound distribution will be realized and response through the midrange region will be just a little more natural and transparent when a loudspeaker is mounted to the front, rather than back surface of the baffle panel. Use of T-nuts and machine screws, provided within the carton packing material, allows the loudspeaker to be removed and reinstalled repeatedly without damaging the enclosure. A second, larger set of hardware is supplied for rear mounting 300 mm (12 in) units.

The seal between the loudspeaker frame and baffle panel must be airtight. When front mounted, a seal is achieved by fitting the white tubular vinyl gasket into a groove on the back of the loudspeaker frame. (A flat, fiber gasket is supplied with the D208H.) Loudspeakers that can be rear mounted are provided with a facing gasket to form a seal. An airtight seal must also be maintained where the input wires enter the enclosure.

When installing the loudspeaker, tighten the mounting screws evenly to avoid the possibility of frame warpage. Avoid excessive force; tighten the screws just enough to prevent air leaks between the frame and the enclosure.

2. Connecting both speakers as described will insure proper 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. Inadvertent out-of-phase operation (which occurs when one set of speaker wires is reversed with respect to the other) will not harm the system, but will cause some acoustical cancellation which will have the audible effect of reducing low frequency response.

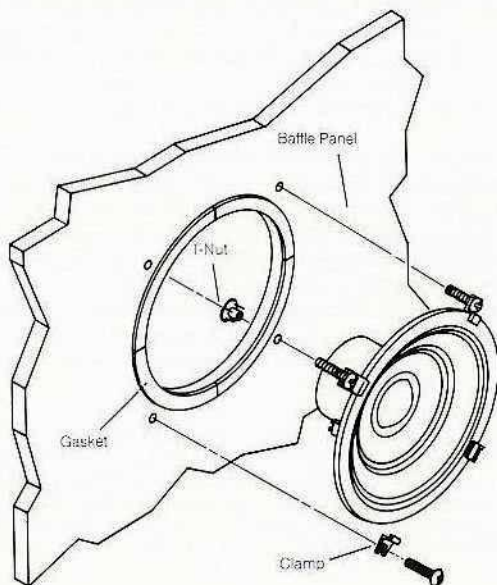
Although JBL loudspeakers are extremely rugged, the cone and other moving parts are subject to accidental damage. Exercise extreme caution whenever using a screwdriver or other tools in their immediate vicinity.

Wall Mounting The D208H and LE8T-H are shallow enough to mount between the studs of most room walls. We recommend that you be certain sufficient depth exists within the wall before cutting an opening. While wall mounting inevitably compromises low frequency performance to some degree, excellent results can still be achieved when space is not available for a conventional, ported enclosure.

Mounting Dimensions

Loudspeaker	Baffle Cutout Diameter		Bolt Circle Diameter	Frame Mounting Hole Drill Size	T-Nut Drill Size	
	Front Mount	Rear Mount			Front Mount	Rear Mount
D208H	179 mm 7 $\frac{1}{16}$ in	179 mm 7 $\frac{1}{16}$ in	194 mm 7 $\frac{7}{8}$ in	5.4 mm $\frac{3}{32}$ in	5.8 mm #1	5.8 mm #1
LE8T-H	179 mm 7 $\frac{1}{16}$ in	Not Recommended	194 mm 7 $\frac{7}{8}$ in	5.4 mm $\frac{3}{32}$ in	5.8 mm #1	
250 mm 10-inch	228 mm 9 in	Not Recommended	245 mm 9 $\frac{5}{8}$ in	5.4 mm $\frac{3}{32}$ in	5.8 mm #1	
300 mm 12-inch	281 mm 11 $\frac{1}{16}$ in	281 mm 11 $\frac{1}{16}$ in	294 mm 11 $\frac{7}{8}$ in	6.7 mm $\frac{1}{8}$ in	5.8 mm #1	8 mm $\frac{5}{16}$ in
360 mm 14-inch	316 mm 12 $\frac{3}{16}$ in	Not Recommended	337 mm 13 $\frac{1}{4}$ in	5.4 mm $\frac{3}{32}$ in	5.8 mm #1	
380 mm 15-inch	355 mm* 13 $\frac{9}{32}$ in	343 mm* 13 $\frac{1}{2}$ in	370 mm* 14 $\frac{5}{8}$ in	7.1 mm $\frac{9}{32}$ in	5.8 mm #1	8 mm $\frac{5}{16}$ in

*When the MA15 is used, the baffle cutout diameter may be as large as 14 $\frac{1}{2}$ in (363 mm), and the bolt circle diameter is from 16 $\frac{1}{8}$ in (416 mm) to 16 $\frac{3}{8}$ in (429 mm). T-nut drill size is $\frac{5}{16}$ in (8 mm).



Use of The MA15

The MA15 loudspeaker installation kit simplifies front mounting and allows greater latitude in the diameter of the baffle cutout.

Installing A Passive Radiator A passive radiator functions like a port. It can be used, where baffle space permits, to tune an enclosure to very low frequencies by varying the number of weights attached to the cone assembly. A passive radiator should be used only with the specific low frequency loudspeakers for which it is recommended.

The passive radiator must be installed with the loudspeaker in an airtight enclosure of the recommended internal volume. Mounting dimensions are the same as for the loudspeaker. For optimum performance, place the two units side by side; however, they can be mounted in any configuration as long as they are no closer than two inches (50 mm) to each other, and not separated by more than six inches (150 mm). Two removable metal discs are attached to the center of the PR15C. The fiberboard disc in front of them is integral to the passive radiator and must not be removed. Each of the metal discs weighs 100 grams. Six fiberboard discs are supplied in the carton; each of these weighs 20 grams.

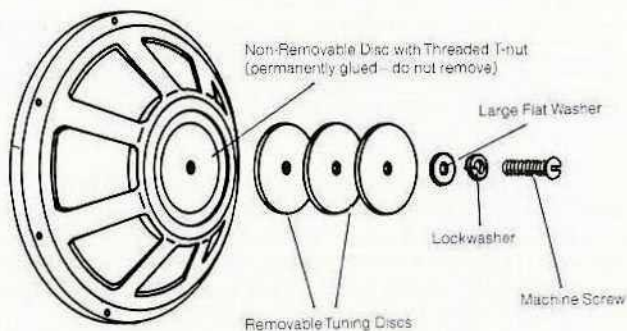
The passive radiator must have the proper mass in order to tune an enclosure to the resonant frequency of the low frequency loudspeaker. This chart provides a guide to the use of the PR15C in its usual applications.

Tuning Chart for PR15C

Install the number of discs indicated for the enclosure volume (m = metal disc; f = fiberboard disc).

Enclosure Volume				
Litres	113 - 141	142 - 160	170 - 197	198 - 225
Cubic Feet	4.0 - 5.0	5.1 - 6.0	6.1 - 7.0	7.1 - 8.0
Used with LE14H, LE15H	3 f	2 f	1 f	0*
Used with 124H, 136H	1 m + 1 f	1 m	-	-

*Do not install machine screw



Tuning A Passive Radiator

When adding or removing tuning discs, be certain that the hardware is in the sequence shown. Tighten the machine screw only enough to hold the discs and washers snugly in place.

Fine Tuning An Enclosure If you are using the detailed plans contained in the JBL Enclosure Construction Kit, follow the porting information provided; it has been validated by the JBL engineering staff. When constructing an enclosure of your own design, use of the porting chart for home entertainment loudspeakers (included in the JBL Enclosure Construction Kit) will result in excellent bass reproduction. Since each recommendation in the chart is averaged for the range of enclosure volumes indicated, the audio perfectionist may wish to further tune his enclosure in order to achieve optimum bass potential. The fine tuning procedure is also useful when dealing with an irregularly shaped enclosure for which calculating the internal volume would be difficult.

The fine tuning procedure is described in the JBL Enclosure Construction Kit. In most instances, following the porting chart will result in a measured tuning frequency within 10% of the optimum recommended for the loudspeaker (see chart below), and therefore, the improvement realized by completing the fine tuning procedure may not always be audible.

Recommended Tuning Frequency For JBL Loudspeakers

Model	Description	Enclosure tuning Frequency
124H 136H	300 mm (12 in) low frequency 380 mm (15 in) low frequency	26 Hz
LE8T H LE10H LE14H LE15H	200 mm (8 in) full range 250 mm (10 in) low frequency 360 mm (14 in) low frequency 380 mm (15 in) low frequency	32 Hz
D130H 130H	380 mm (15 in) extended range 380 mm (15 in) low frequency	45 Hz
D208H	200 mm (8 in) extended range	55 Hz

If system tuning is higher than recommended for the loudspeaker, cover a portion of the port or lengthen the duct, if one is used. Conversely, if system tuning is lower than recommended, make the port larger or shorten the duct. When tuning a passive radiator, begin with fewer tuning weights than recommended for the enclosure volume. Add weights if system tuning is higher than recommended; remove weights if the system tuning is lower than desired. A passive radiator can be temporarily mounted "inside out" so the tuning weights are easily accessible. Additional washers used in conjunction with the weights supplied will aid in obtaining precise tuning.

Midrange And High Frequency Drivers

The LE5H, LE21H, 075, and 077 mount directly to the enclosure baffle panel, and compression drivers are bolted to their appropriate horns. Components and horns intended for enclosure mounting are provided with a tubular vinyl flange gasket for an airtight installation. Large freestanding horns, of course, do not require such a gasket.

With the exception of freestanding horns, a high frequency unit is normally positioned on the baffle panel directly above or below the bass loudspeaker, and slightly to the side if necessary to accommodate panel dimensions. If the distance between the pair of enclosures is limited, the high frequency units can be mounted on the outboard side of their respective bass loudspeakers; conversely, if the enclosures are further apart than average, the high frequency units can be mounted on the

inboard side of their respective bass units. If the loudspeaker system is to have low, midrange and high frequency components, placing them in a vertical line (low, mid and high) will generally provide widest and most uniform sound distribution within the listening room. For best acoustics, components should be as close together as practical, but at least 50 mm (2 in) apart to maintain the structural integrity of the baffle panel.

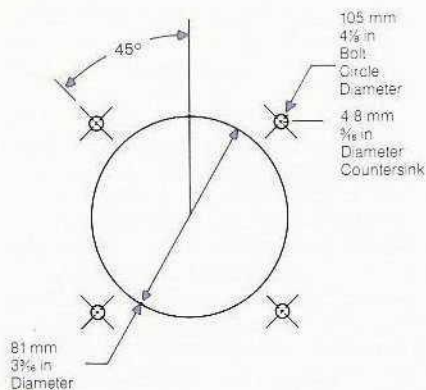
Positioning the high frequency driver near, or directing its output toward, listener ear level will usually result in the most realistic performance.

Caution: To prevent serious damage, never connect a midrange or high frequency transducer directly to any source capable of generating low frequency signals. Connection should be made only to the respective mid or high frequency terminals of the recommended JBL frequency dividing network. If separate amplifiers are used for the various components of the system (bi-amplification or tri-amplification), a properly designed high-pass filter must be used—in addition to an electronic frequency dividing network—to protect the transducer from turn-on transients and other accidental low frequency signals.

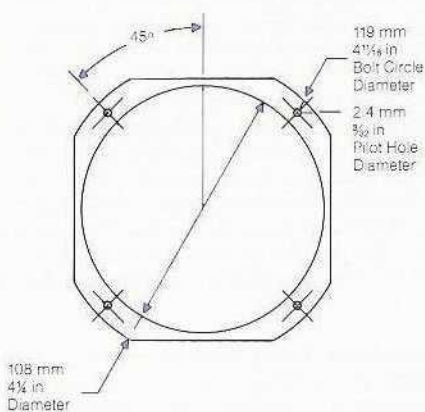
LE5H Midrange Transducer The LE5H must be housed in an isolated sub-chamber to prevent interaction with the low frequency loudspeaker. For smoothest frequency response the sub-chamber should have a minimum volume of 1.3 litres (80 in³), and should be filled to moderate density with fiberglass acoustic damping material. A sub-chamber can be fabricated of a tube having an internal diameter of 114 mm (4½ in) and a length of 130 mm (5 in) flush mounted on the baffle panel and closed at its interior end. Insert the input leads through a small hole punched in the side of the tube (use caulking compound to maintain an airtight seal), and install the damping material. Press the tubular vinyl gasket into the groove on the back of the mounting flange, connect the input leads, place the LE5H into the tube and secure it to the baffle panel with the four self-tapping screws provided.

LE21H High Frequency Direct Radiator The LE21H mounts directly to the front of the baffle panel using T-nuts and machine screws. The cutout should be 105 mm (4¼ in) in diameter, with additional clearance provided for the terminals (see the diagram on the next page). The flat gasket on the rear of the mounting flange will form an airtight seal. Place the LE21H in the mounting cutout and tighten the screws a little at a time, maintaining even pressure on the gasket. Do not overtighten.

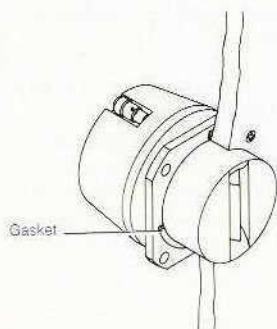
075 And 077 The 075 and 077 mount from the rear of the baffle panel in an 81 mm (3¾ in) diameter cutout; the driver is held in place by four machine screws extending through the baffle panel. Place the tubular vinyl gasket around the horn and seat it against the mounting bracket prior to inserting the unit into the baffle cutout. NOTE: The 077 should be mounted with the slot vertical, as shown, to provide maximum horizontal dispersion. The 075 produces a conical sound distribution pattern and needs no particular mounting orientation.



075, 077 Mounting Dimensions

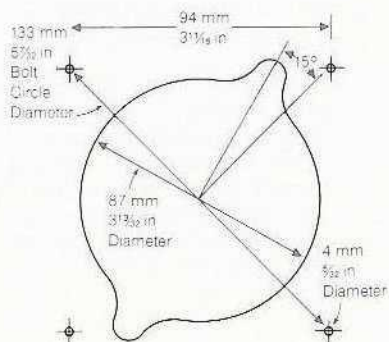


LE5H Mounting Dimensions



075 Or 077 Installation

Install the 077 as shown, for widest sound distribution in the horizontal plane.



LE21H Mounting Dimensions

LE175, LE85 And 376 Compression Drivers A compression driver must be bolted to the appropriate high frequency horn, which in turn, will be mounted to the baffle panel or freestanding on top of the enclosure. Bolts ($\frac{1}{4}$ -20, $\frac{7}{16}$ " hex head) supplied with the driver should be tightened evenly, and just enough to achieve a snug fit without overtightening. The perforated center section of the fiber gasket on the mating surface of the driver must be removed before installation. It is good practice to cover the exposed throat opening with plastic electrical tape whenever the driver is not actually installed on a horn to prevent foreign matter from entering the driver, particularly iron filings or chips which can be attracted by the strong magnetic field which exists in the driver throat.

Horns And Acoustic Lenses

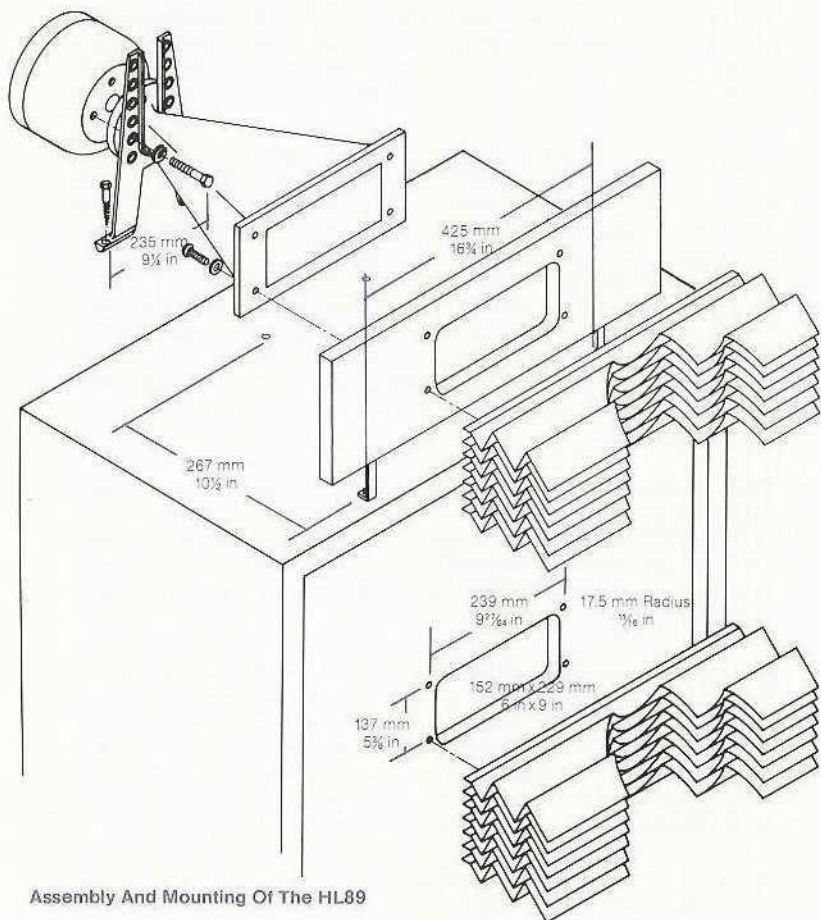
A horn/lens assembly couples the output of a compression driver to the air in the listening environment and spreads the sound outward throughout the room in a predetermined pattern. The smaller horn/lens assemblies are usually mounted to the enclosure baffle panel; the larger horn/lens assemblies will be freestanding on top of the enclosure.

Caution: When a horn is mounted to a sturdy baffle panel of the recommended thickness, it will not be necessary to support the driver. However, the driver must be separately braced or removed from the enclosure whenever the loudspeaker system is transported, since under such circumstances it is possible for the weight of the driver to pull the horn from the baffle panel.

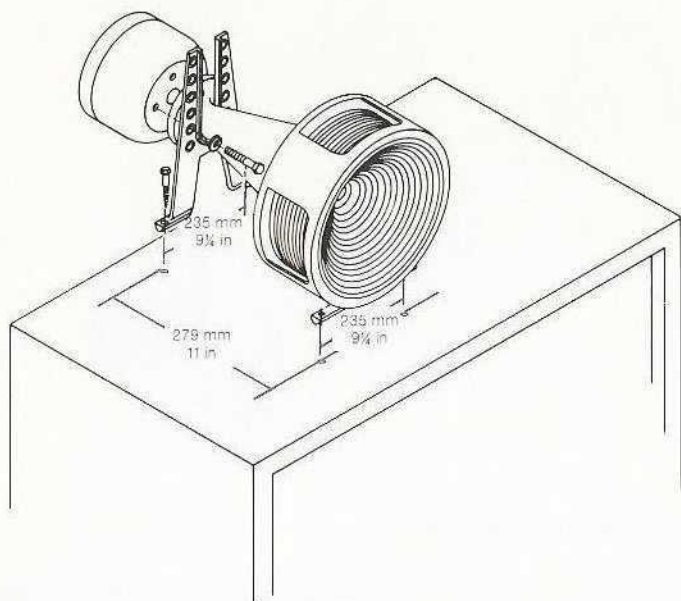
HL87 Perforated-Plate Horn/Lens The HL87 mounts from the front of the enclosure in a 134 mm ($5\frac{3}{16}$ in) diameter baffle cutout. It is secured by four machine screws and T-nuts. After making the baffle cutout, place the HL87 in position and use it as a pattern to mark the location of the holes for the mounting screws. The drill bit size required for the T-nuts is 8 mm ($\frac{5}{16}$ in).

HL88 Perforated-Plate, HL89 Serpentine And HL90 Slant-Plate Horn/Lens Assemblies These large horn/lens assemblies mount on top of the enclosure. The mounting brackets must be assembled to the horn/lens per the accompanying illustrations. The HL89 is shown with the MA25 installation kit, consisting of mounting brackets and a baffle which is required for optimum performance. It is also possible to mount an HL89 on the enclosure baffle panel using the cutout illustrated.

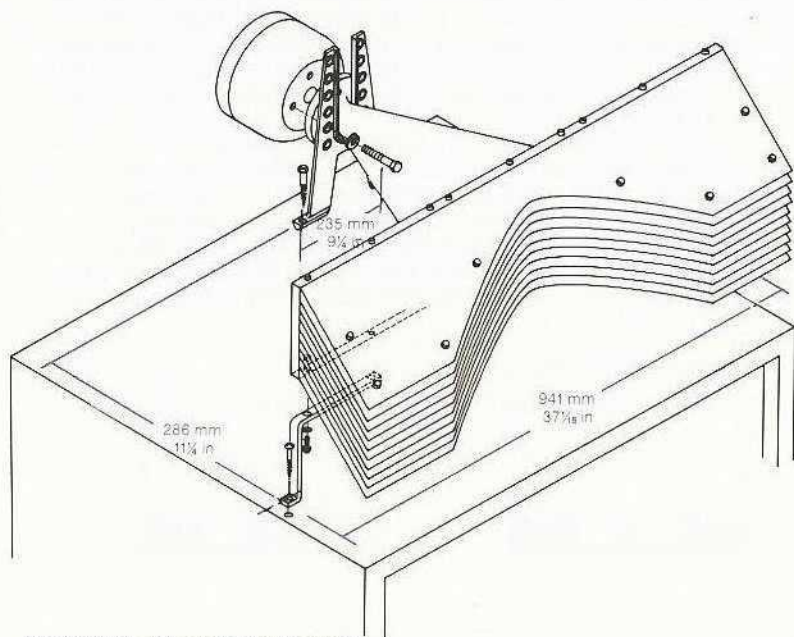
HL91, HL92 And HL93 Slant-Plate Horn/Lens Assemblies The HL91, HL92 and HL93 mount on the enclosure baffle panel, as illustrated. The baffle cutout is 108 mm ($4\frac{1}{4}$ in) in diameter. Countersink the four 7 mm ($\frac{1}{2}$ in) holes for the flathead mounting screws. The white vinyl ring gasket should be placed on the horn mounting flange to insure an airtight seal. (Continued on page 12.)



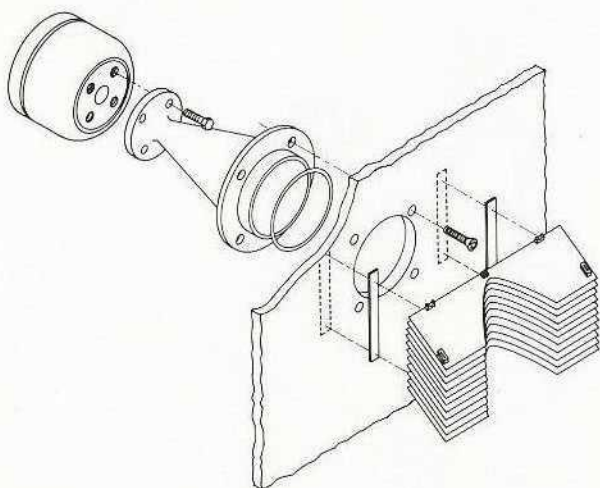
Assembly And Mounting Of The HL89



Assembly And Mounting Of The HL88



Assembly And Mounting Of The HL90

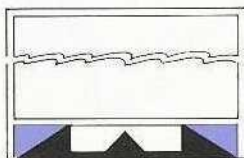
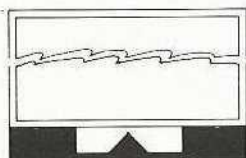


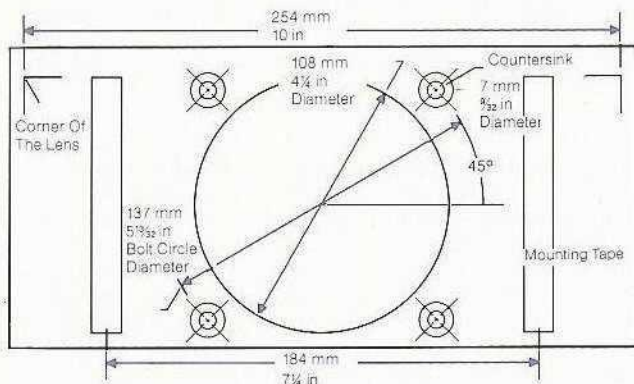
Mounting The HL91, 92 And 93

The lens is affixed to the front surface of the panel with hook-and-pile mounting tape. While the "pile" strips are still attached to the "hook" sections on the lens, remove the paper backing to expose the adhesive, place the lens in position over the baffle cutout, and press the adhesive against the panel. Remove the lens from the tape (if necessary, remove the tape as well, after marking its location on the baffle) and permanently affix the tape to the enclosure with staples or small carpet tacks. As the lens is removed from the tape, a "ripping" sound will be heard, indicating normal disengagement.

A clearance of 67 mm (2½ in) between the baffle panel and the grille assembly is required for the lens. The grille should wrap around the enclosure so that both sides as well as the front of the lens are unobstructed, for optimum sound distribution. If the sides of the enclosure must be completely solid, a wedge built up of fiberglass should be cemented in position on either side of the lens, running the full height of the enclosure. Ledges at the top or bottom of the baffle panel should be treated in a similar manner.

Top View Of Lens Installation





HL91, HL92 And HL93 Mounting Dimensions

Frequency Dividing Networks

JBL dividing networks provide imperceptible distribution of the audio signal among the transducers of the loudspeaker system. All JBL networks are engineered to match the exact characteristics of specific components, including the horn/lens assembly, as shown in the Network Selection Chart. We do not recommend using JBL loudspeaker system components in other combinations or with those of other manufacturers.

Adjustment Each JBL dividing network is provided with a level control that permits matching loudspeaker system performance to the acoustic characteristics of the listening room and to listener preference. The control regulates the amount of power fed to the high frequency transducer. It does not affect the crossover frequency, nor does it limit the upper frequency response of the loudspeaker system.

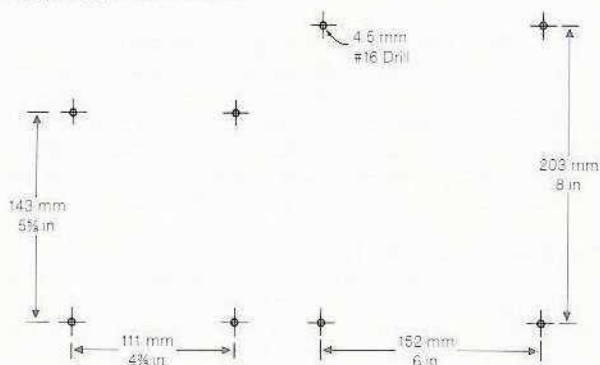
Adjustment of the level control should be made on the basis of evaluation of normal program material played monaurally with amplifier tone controls at the middle, generally referred to as "flat," position. Once the loudspeaker system has been balanced for best overall results, compensation for additional differences in program material should be made with the tone controls on the preamplifier or receiver.

General—General application networks have either a continuously variable or three-position control. With the control in the mid position, evaluate the relative loudness of high frequency program material and raise or lower the control setting to obtain the most realistic musical balance. When two dividing networks are required, such as an N8000 used in conjunction with an LX13, first set the high frequency network control at its minimum position (so the ear will perceive only the balance between the low frequency and midrange components), secondly, adjust the low frequency network for the most pleasing balance, and finally, adjust the high frequency network for the most pleasing treble performance.

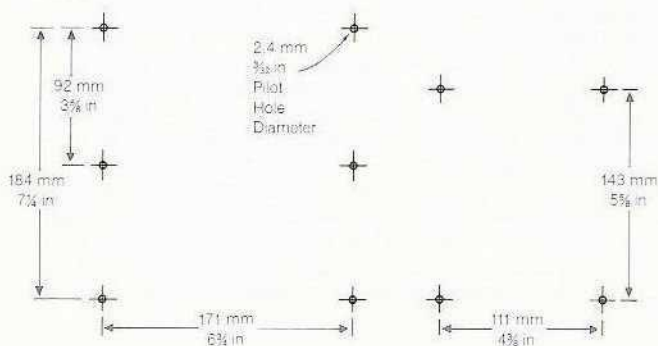
LX30 and LX300—The LX30 and LX300 have Presence (midrange) and Brilliance (high frequency) controls. Rotate the Brilliance control to the minimum position, adjust the Presence control, and then set the Brilliance control.

Mounting General application dividing networks are usually mounted on the rear panel of the enclosure. The cutout pattern illustrated is for self-contained networks and for the control assembly of the larger LX30, LX50A and LX80A. Wood screws, as well as machine screws and T-nuts, are provided to secure the assembly to the enclosure. Be certain that the white vinyl flange gasket is in place in order to maintain an airtight seal. The main assembly of the larger networks is normally placed on one of the interior surfaces of the enclosure and secured by four machine screws extending through the panel into threaded fasteners on the network.

LX30, LX50A and LX80A



LX300



Network Mounting Dimensions

Network Connection The network input terminals should be connected to the amplifier loudspeaker outputs. Connect the black terminal of general application networks to the negative amplifier output, and the red terminal to the positive amplifier output. Heavy-duty networks are provided with screw terminals. The input terminal located on the white line, marked "C" for common, should be connected to the negative amplifier output; connect the other input terminal to the positive amplifier output.

General application networks have eyelets that allow lead wires to pass through the flange into the enclosure and at the same time maintain an airtight seal. The LX30, however, has screw terminals on the back of the control assembly. Color-coded wires are provided, although any 18-gauge insulated wire can be substituted. The proper wire gauge for the amplifier connection is discussed under Amplifier Connection.

Connections between the network and the components are illustrated in the accompanying diagrams, as indicated in the Network Selection Chart. Care should be taken to follow the diagrams exactly to ensure that components will operate in the proper phase relationship with each other.

Note that high frequency compression driver phasing is a function of the crossover frequency as well as the horn/lens assembly utilized. The wiring illustrations are correct when an HL87, HL91, HL92 or HL93 is mounted on the enclosure baffle panel; and when an HL88, HL89 or HL90 is positioned so that the horn mouth is flush (even) with the enclosure baffle panel. If the horn/lens assembly is moved more than six inches toward or away from the listener (with respect to the mounting conditions just outlined), install a phase reversing switch (described on page 24) and audition male vocal material while changing phase of the high frequency driver. Utilize the phase condition which yields the most natural reproduction.

Network Selection Chart

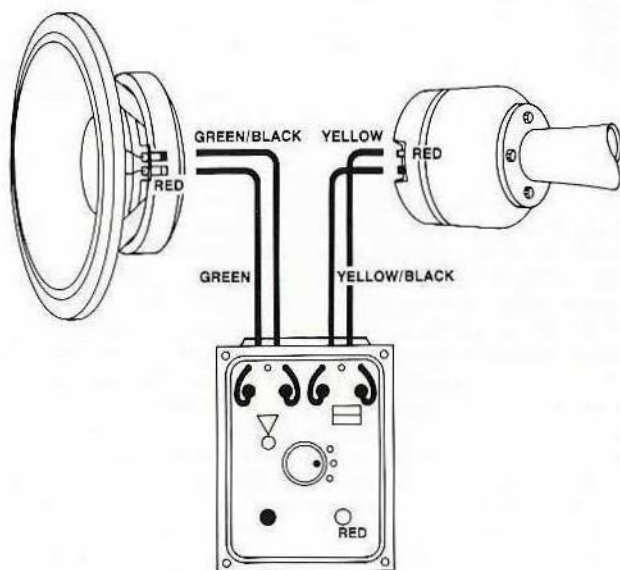
Network	Low Frequency	Transducers Mid and High Frequency	Horn/Lens Assembly	Illustration
LX5	LE15H	376 ¹	HL93	A, B
LX10	LE14H	LE175, LE85	HL87, HL91	D
LX13	LE15H	LE175, LE85	HL92	A
LX14	LE10H	LF21H		C
LX30	124H, LE14H	LE5H+077		E
LX50A	130H, 136H	376 ²	HL88, HL89, HL90	F
LX80A	124H, 130H, 136H, LE14H	LE175, LE85, 376	HL92, HL93	F, G
LX200B	124H, 136H, LE14H	LE175, LE85	HL91	K
LX300	124H, 136H, LE14H	LE175+077 LE85+077	HL92	L
N1200	D130H, 130H	LE175, LE85	HL87, HL91	H
N2400	D130H	075		I
N7000		376+075 376+077		J
N8000		LE175+075 LE175+077 LE85+075 LE85+077		J

¹Since the 376 is a midrange compression driver, an N7000 with an 075 or 077 will be required for extended high frequency reproduction.

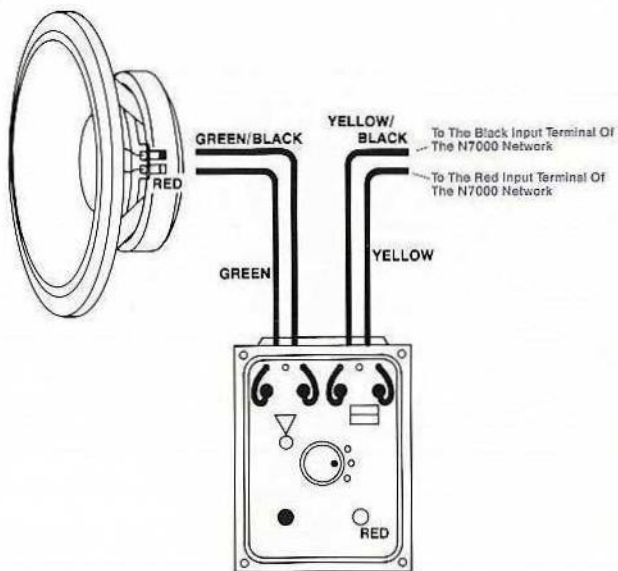
²When the 376 is used with the LX50A, connect the N7000 as if it were the compression driver shown in Illustration F. Connections from the N7000 to the 376 and 075 or 077 are shown in Illustration J.

System Wiring Illustrations

A

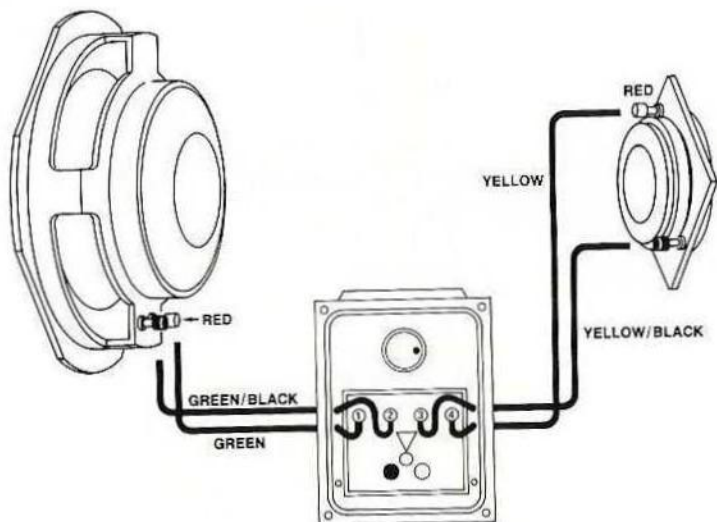


B



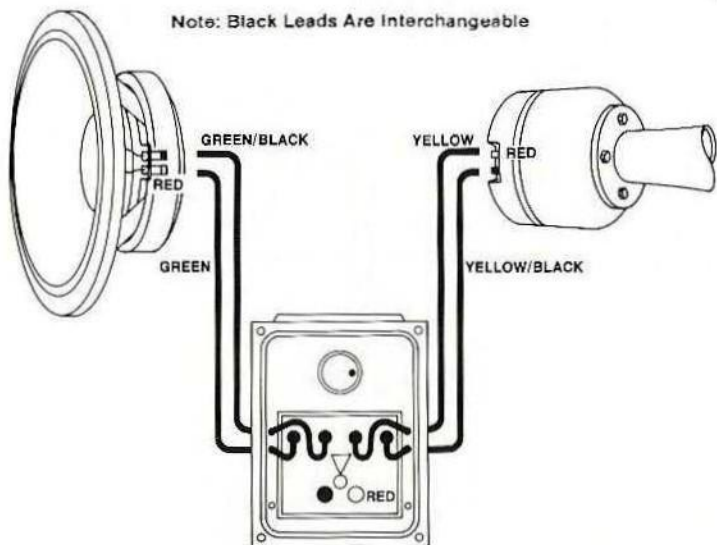
Note: The color codes illustrated represent the latest configuration. Earlier units were supplied with two black wires instead of green/black and yellow/black wires, and a red wire instead of the yellow wire shown.

C



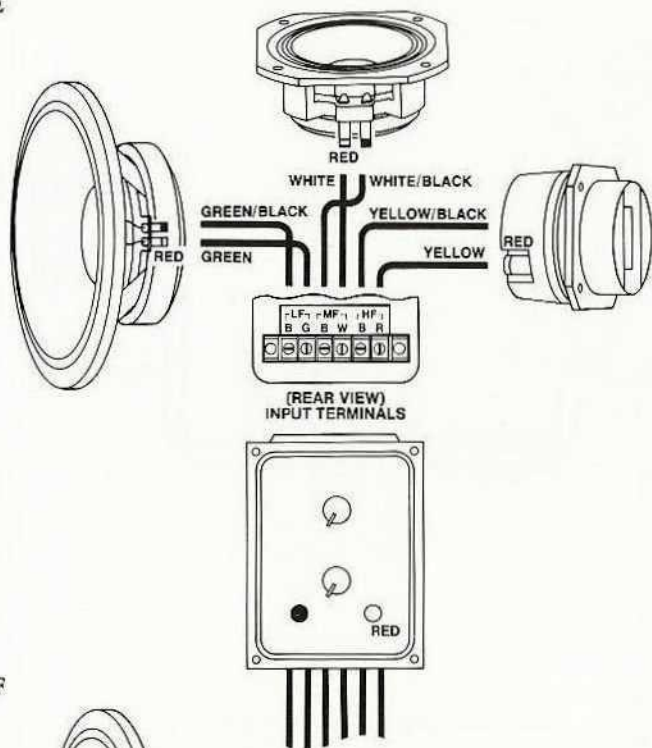
D

Note: Black Leads Are Interchangeable

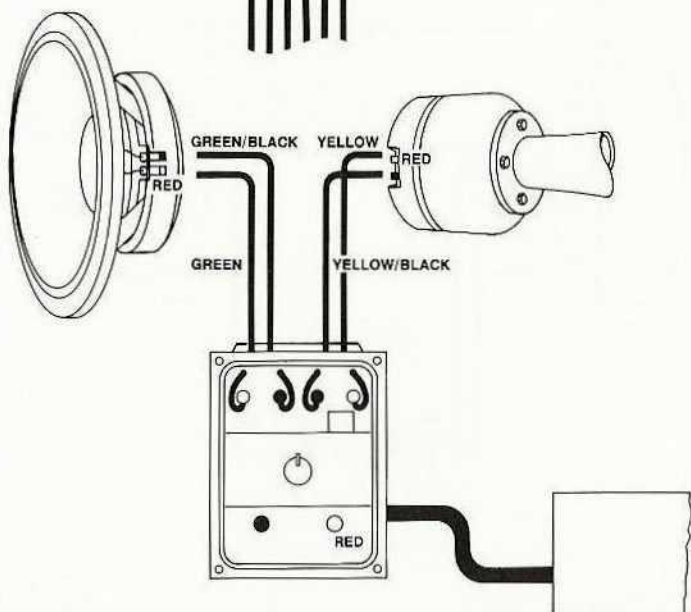


Note: The color codes illustrated represent the latest configuration. Earlier units were supplied with two black wires instead of green/black and yellow/black wires, and a red wire instead of the yellow wire shown.

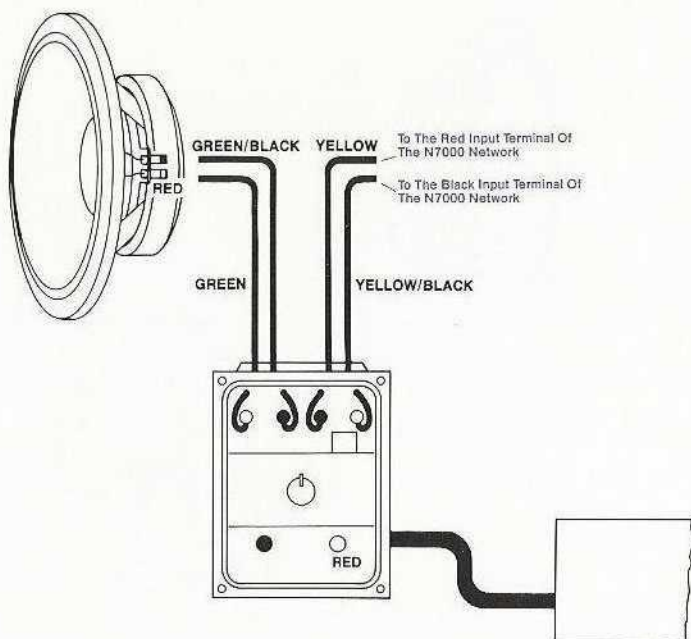
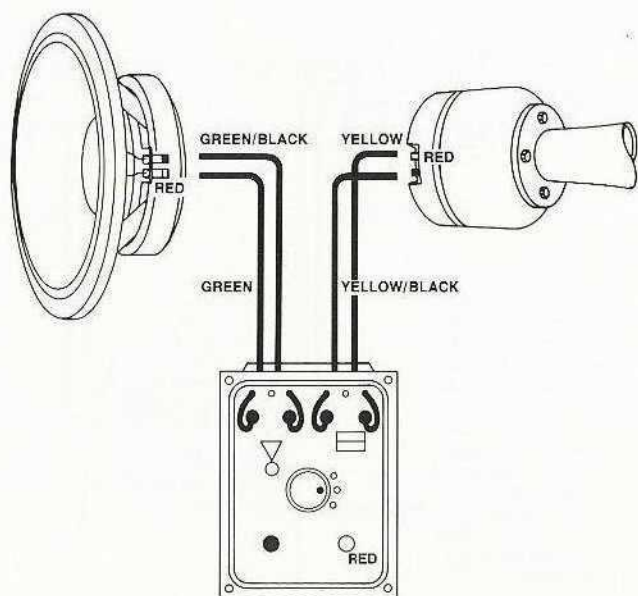
E



F

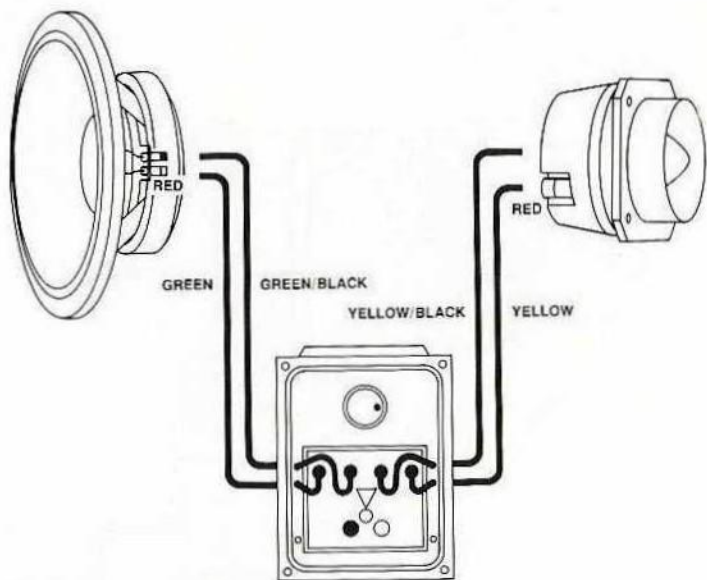


Note: The color codes illustrated represent the latest configuration. Earlier units were supplied with two black wires instead of green/black and yellow/black wires, and a red wire instead of the yellow wire shown.

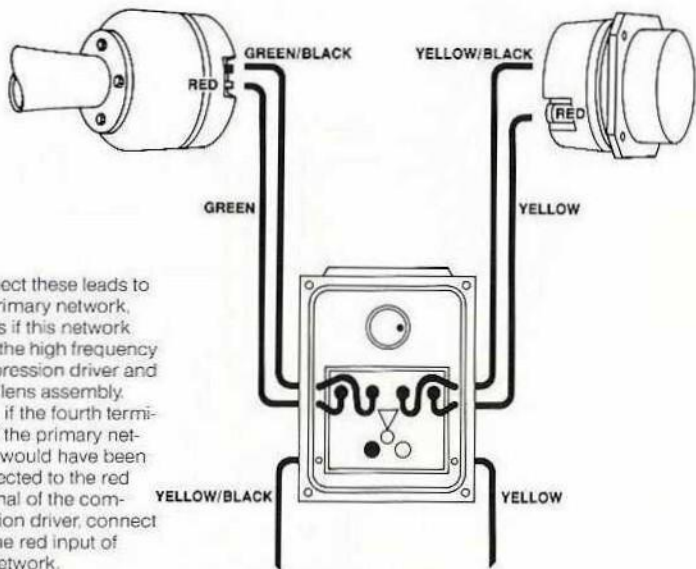
G**H**

Note: The color codes illustrated represent the latest configuration. Earlier units were supplied with two black wires instead of green/black and yellow/black wires, and a red wire instead of the yellow wire shown.

I



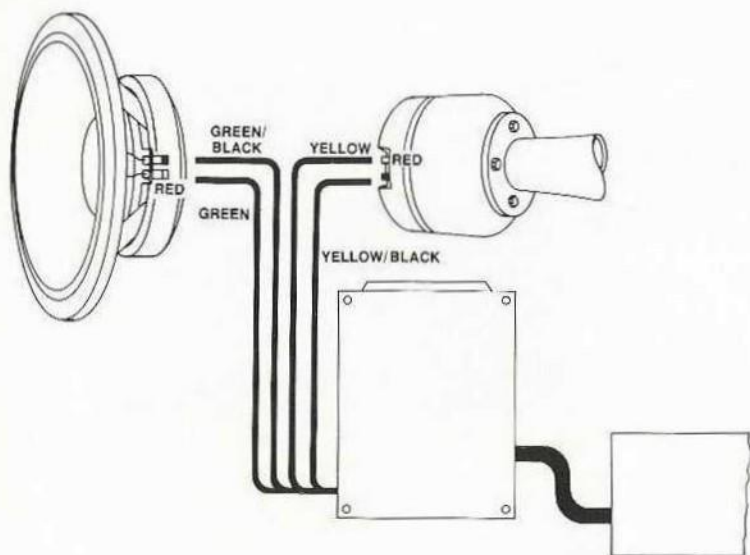
J



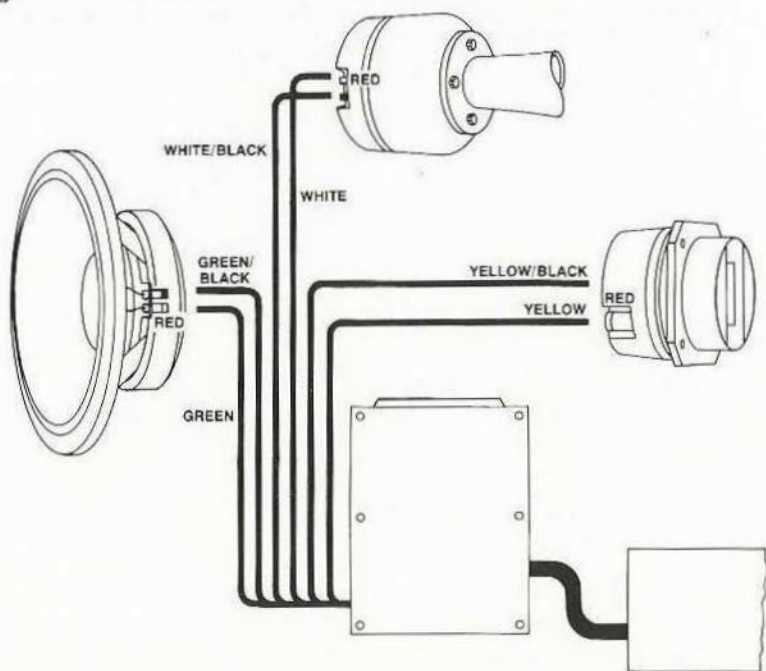
Connect these leads to the primary network, just as if this network were the high frequency compression driver and horn/lens assembly. Thus, if the fourth terminal of the primary network would have been connected to the red terminal of the compression driver, connect it to the red input of this network.

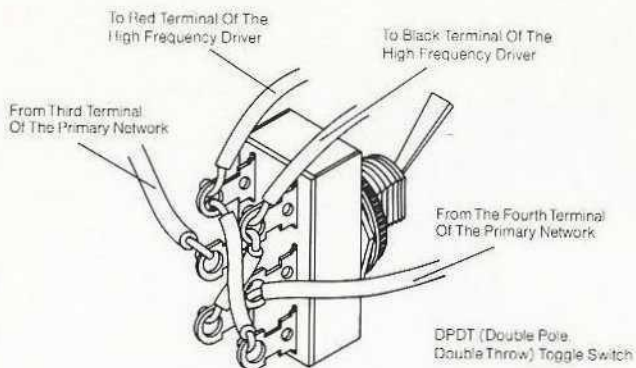
Note: The color codes illustrated represent the latest configuration. Earlier units were supplied with two black wires instead of green/black and yellow/black wires, and a red wire instead of the yellow wire shown.

K



L





Phase Reversal Switch

Install jumpers as shown, using 18-gauge insulated wire. When the switch is in the top position, the top terminals will be energized and the compression driver will be phased as if it were still connected to the network. When the switch is thrown, the phase of the driver will be reversed. It is recommended that the leads be made long enough to allow operation of the switch while auditioning the loudspeaker system from the usual listening location.

Service

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

