

## Installation

The 4350 has provision for mirror image mounting of the high frequency components to minimize or maximize acoustic separation between systems, as desired. The system is shipped with all drivers installed in the "left-hand" configuration. When the two high frequency units are interchanged with their respective cover plates on the right side of the baffle panel, the system will be considered to be in the "right-hand" configuration. Three of the most useful acoustical arrangements for a pair of 4350s are shown on the next page as examples of the several possibilities, such as inverted suspension or multi-unit arrays, that exist. Specific mounting instructions are provided under Component Removal, starting on page 4 of this manual.

Determination of the preferred configuration for each 4350 should be made only after careful audition (and/or measurement) of the total sound reproduction chain with each monitor placed in its final room position. If additional treble separation is desired, the high frequency components of the unit intended for right-hand placement can be remounted to increase their physical distance

from the other system. Conversely, a reduction of treble separation can be achieved by mounting the high frequency transducers of the unit on the left to minimize the acoustic distance between systems. In many instances—where consistent driver spacing is preferred, or if the listener is far enough from the enclosures so that individual sound sources cannot be perceived—changing the configuration will not be necessary.

The high frequency acoustic lens is packed with the grilles in a separate container. It should be positioned on the enclosure baffle panel over the mouth of the high frequency horn. Mounting tape on the baffle panel and on the appropriate surfaces of the lens holds the unit in position.

## Placement

For optimum source localization within the stereo image, a pair of 4350s should be arranged so that the listening position is centered between the two systems and no more than  $30^\circ$  off-axis horizontally (or  $15^\circ$  vertically) from either unit. If three or more 4350s are used, the enclosures should be angled toward the horizontal center line of the array to obtain the recommended pattern overlap at the listening position. Note: A minimum distance of 2.5 metres (8 feet) should be maintained between the 4350 and the listener.

Eye bolts are provided on the bottom of the enclosure to allow inverted suspension. The eye bolts are anchored to a heavy duty steel brace bolted to the baffle panel and to the bottom panel of the enclosure. To preserve the clean visual lines of the enclosure, the base may be removed when the eye bolts are utilized. If the base is removed (nine machine screws threaded into T-nuts), the screws should be replaced to maintain the air-tight seal of the acoustic chamber.

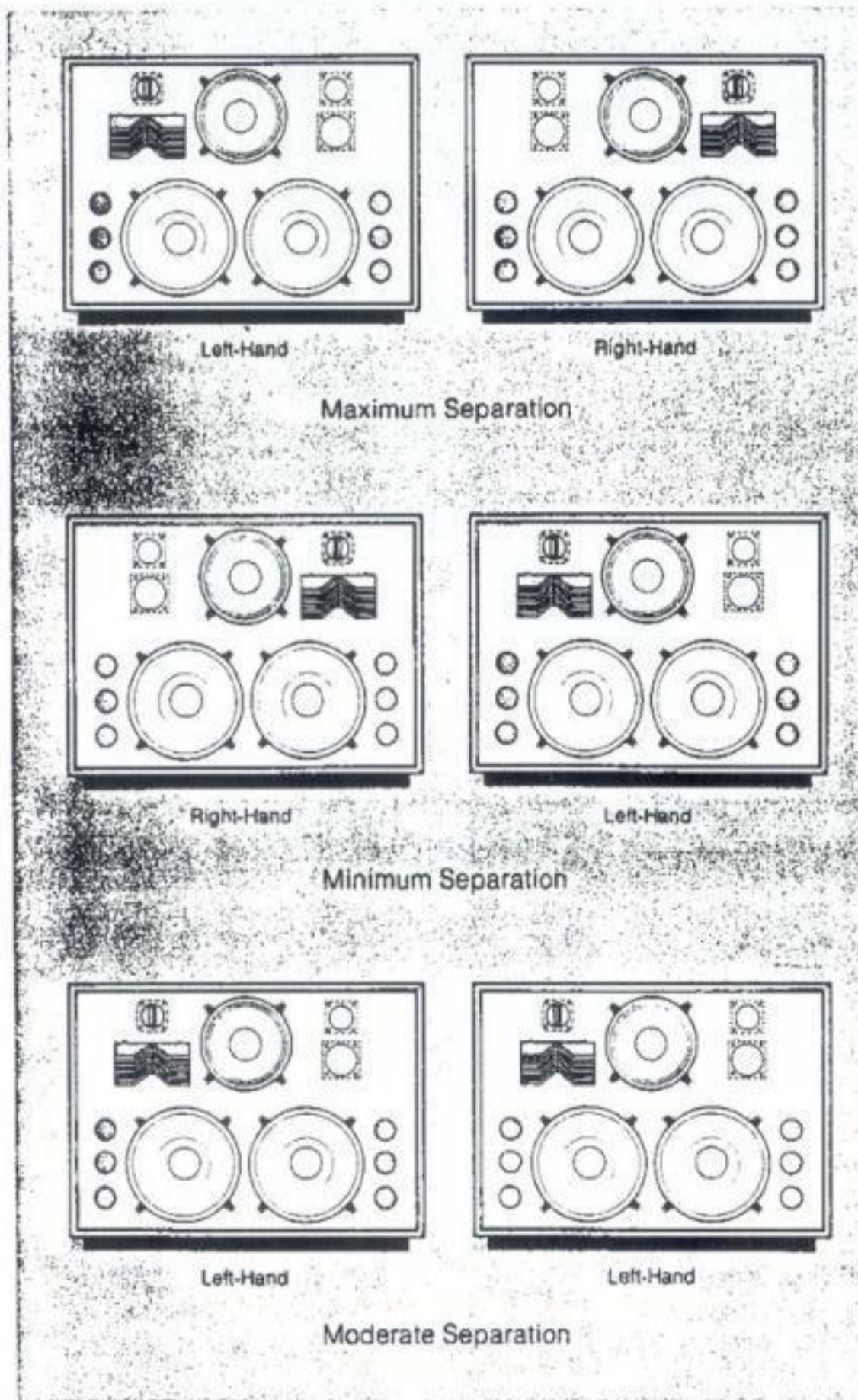
## Grilles

The two grille sections of the 4350 are secured to the enclosure with mounting tape and positioned by dowel pins at the ends of each assembly. The JBL nameplate, located on the upper grille section, is held in place with removable spring clips. An alternate mounting position is provided at the opposite end of the grille so that the nameplate can be moved to avoid interference with the high frequency components when they are transferred to the right-hand configuration. The locating pins on the back of the nameplate are arranged symmetrically so that it can be rotated  $180^\circ$  to read correctly whenever the 4350 is installed in the inverted position.

## Connections

Input to the 4350 is through spring-loaded terminals located on the back of the enclosure. Two color-coded sets of terminals are provided and labeled for the low or high frequency sections of the system. Observe consistent polarity between the two inputs so that both red terminals receive a positive signal or both receive a negative signal.

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



## Utilizing A Pair Of 4350s

Right- and left-hand nomenclature has been adopted only as a convenient reference. Using two 4350s in the right-hand configuration would provide the same separation as a pair of units in the original left-hand configuration.



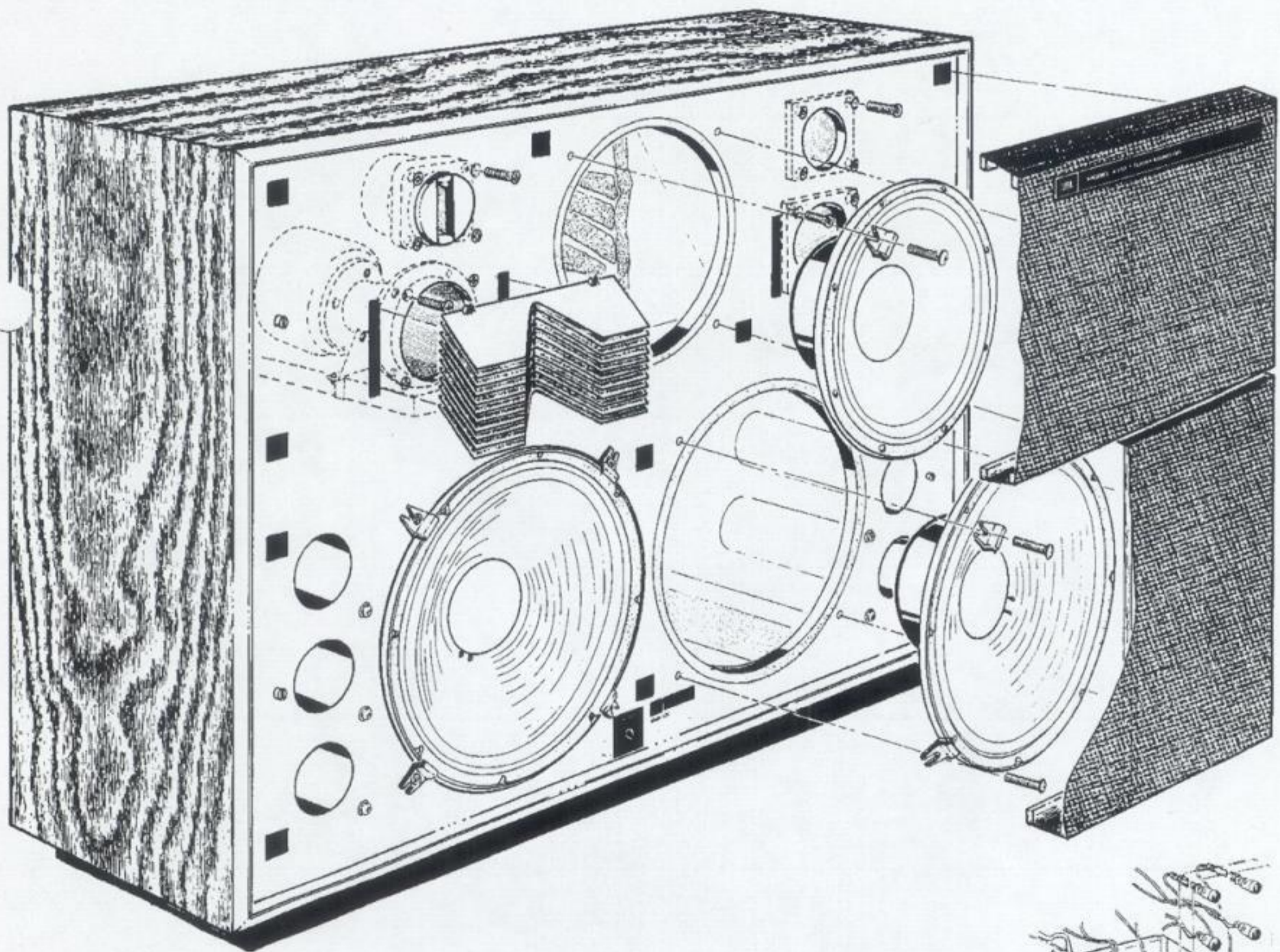
One-mm (18 AWG) insulated wire is the minimum size recommended for loudspeaker connections up to 15 m (50 ft). Heavier gauge wire is recommended for greater distances: 1.2-mm (16 AWG) up to 30 m (100 ft) and 1.6-mm (14 AWG) up to 60 m (200 ft).

### System Adjustment

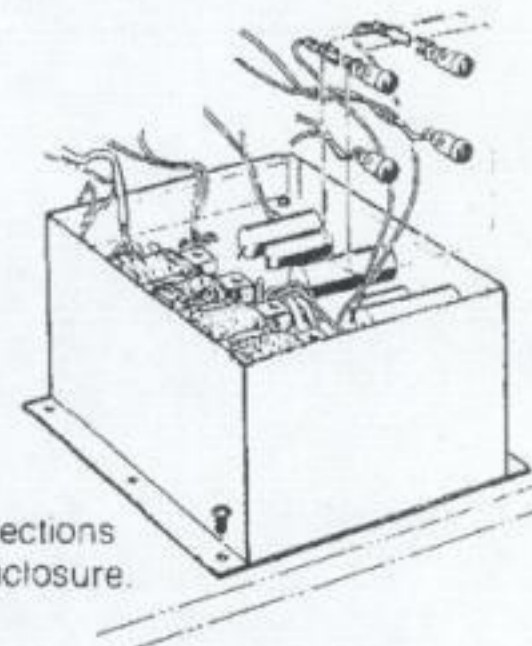
Bi-amplification of the 4350 allows utilization of two moderately powered amplifiers rather than a single, large amplifier. Since the power density demanded from each amplifier is reduced in bi-amplification, each power source is less likely to approach its limits of distortion, even though considerable volume levels are achieved. The low frequency loudspeakers operate to 250 Hz and require an attenuation rate of 12 dB per octave below and above the crossover frequency. Transition may be accomplished with a JBL 5233 (single channel) or 5234 (dual channel)

Electronic Frequency Dividing Network or with one of several electronic crossovers or filtering devices commercially available.

The system can be balanced subjectively using familiar program material or, more accurately, with white noise, pink noise or bands of noise. Balance can be determined electronically using pink noise and adjusting the output voltage levels of the low and high frequency amplifiers so that they are equal to each other, measured at the respective input terminals of the 4350. The ultra-high frequency level control can be adjusted subjectively or by measuring output using pink noise as source material. If low-level crossover networks are to be utilized for the high frequency and ultra-high frequency transitions, complex acoustical testing apparatus will be required for proper balancing of the resultant system. Therefore, the 4350 is not fitted with terminal connections for any configuration other than the standard loudspeaker system described in this publication.

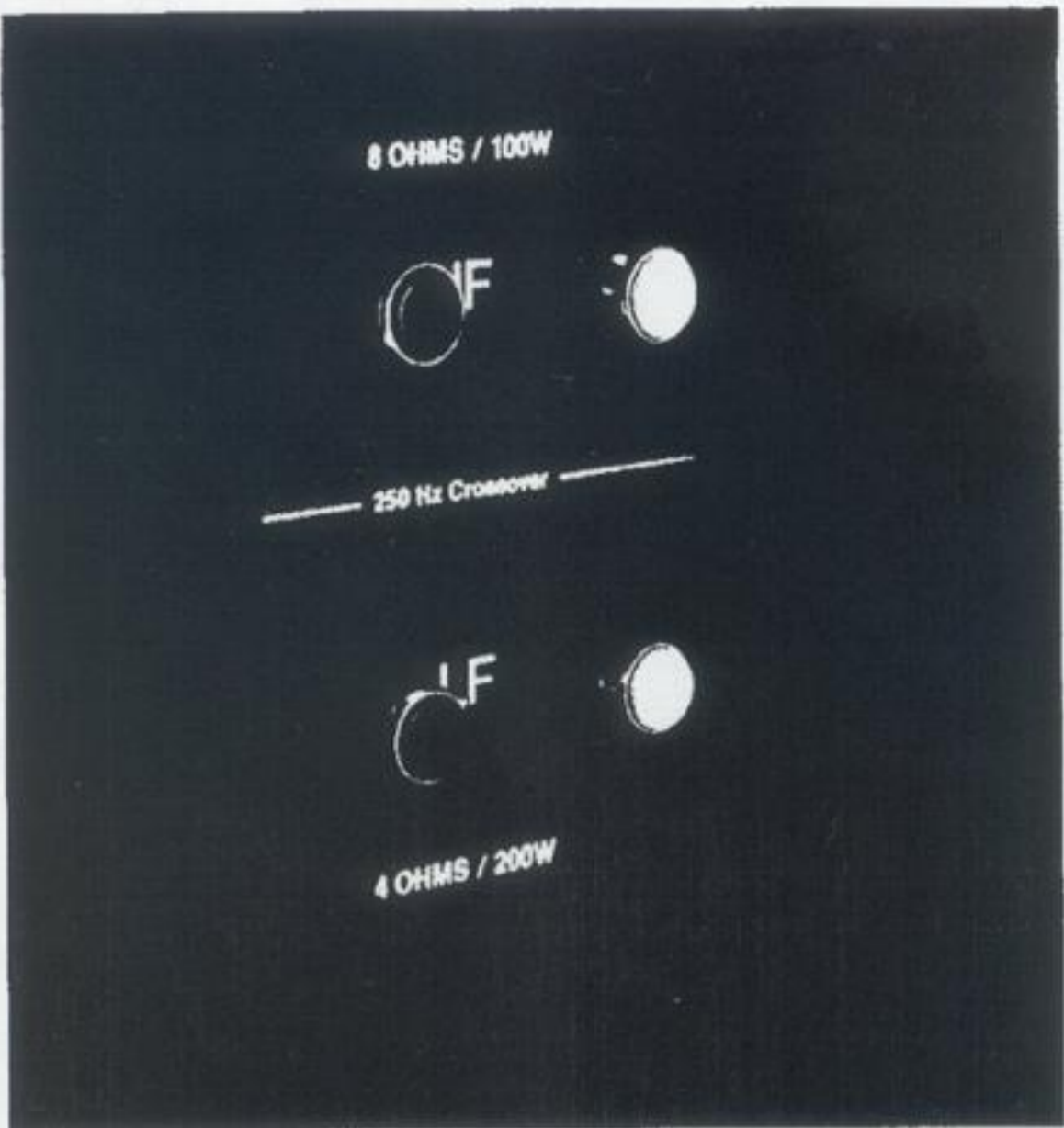


Component installation in the 4350 enclosure: left-hand configuration shown. Note vertical orientation of the ultra-high frequency transducer action slot.



System and network connections viewed from rear of the enclosure.





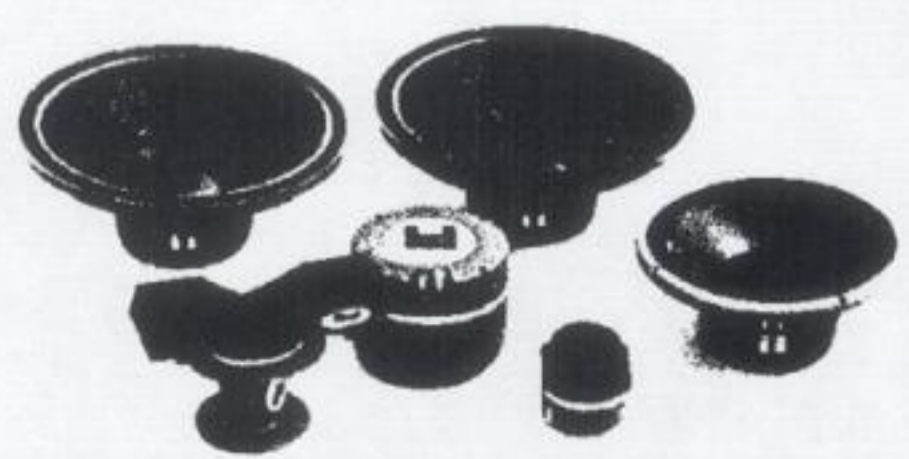
Input terminals to the 4350. Observe consistent polarity for the low and high frequency sections of the loudspeaker system.

**Amplifier Power**

The maximum recommended power input to the low frequency loudspeakers is 200 W continuous sine wave at an impedance of 4  $\Omega$ , and 100 W continuous sine wave at 8  $\Omega$  into the high frequency section. Larger amplifiers can be employed if normal precautions against input device distortion or amplifier clipping are followed.

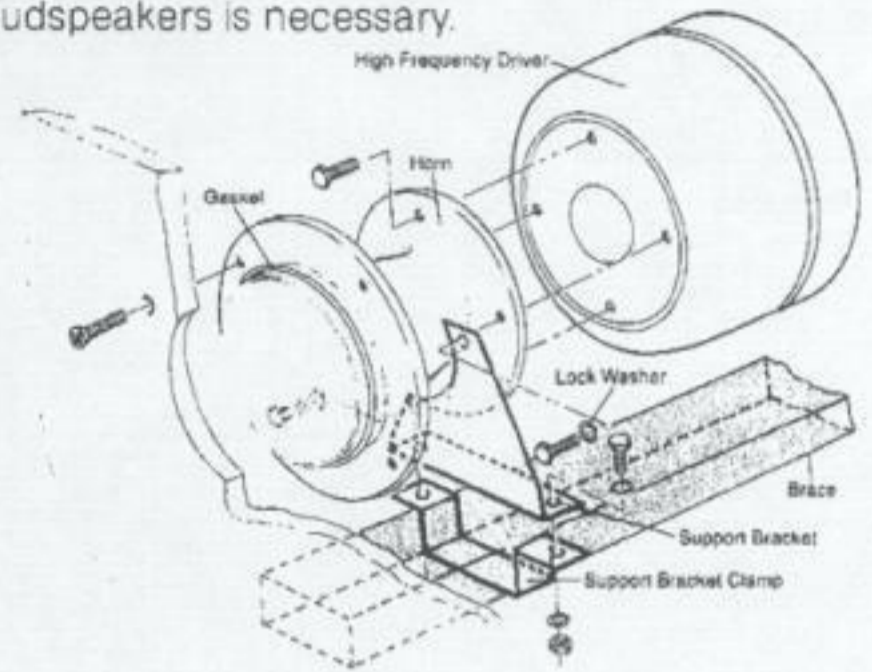
**Component Removal**

To optimize the sound dispersion characteristics of the loudspeaker system, maintain the acoustical integrity of the enclosure and facilitate inspection and service, all components mount directly to the baffle panel and are removable from the front of the enclosure.

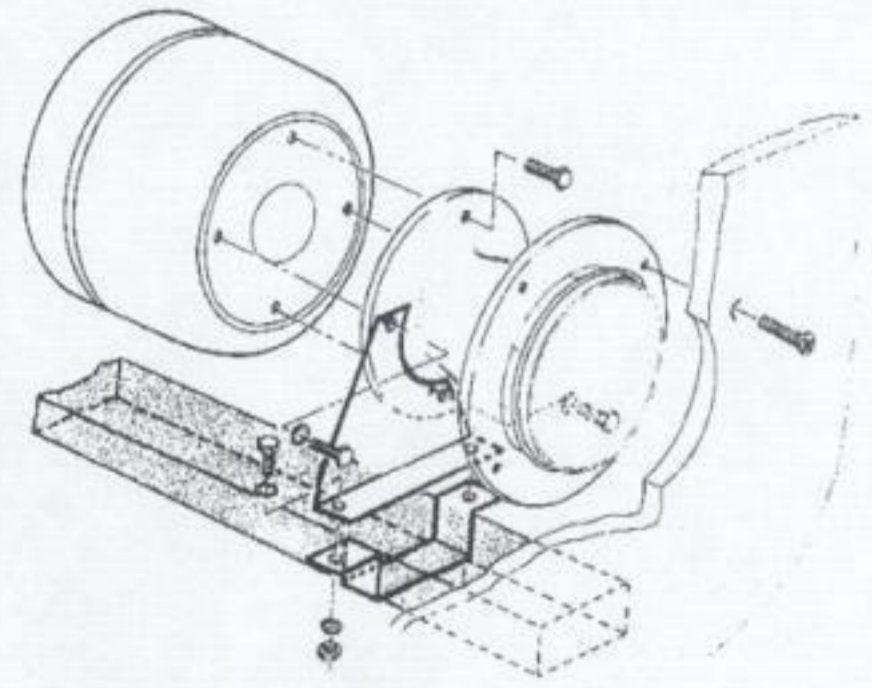


Loudspeaker system components of the 4350 Studio Monitor.

It is recommended that the enclosure be placed on its back when removing any of the components. Removal of the left low frequency loudspeaker is required when taking out the high frequency or ultra-high frequency drivers; however, it is advisable to remove both low frequency loudspeakers to provide maximum access to the interior of the enclosure and as a safeguard to prevent accidental damage which could occur to the right low frequency loudspeaker if it were left in place. When converting the 4350 to the right-hand configuration, removal of both loudspeakers is necessary.



Left-Hand Configuration



Right-Hand Configuration

Installation of the high-frequency compression driver and horn are as shown. Note orientation of the support bracket and use of lock washers in each configuration.

*Low Frequency and Midrange*—The low frequency and midrange loudspeakers are each secured to the enclosure by four cast clamps held in place by machine screws threaded into T-nuts. Each loudspeaker can be taken out of the enclosure by loosening the mounting screws, removing the clamps and lifting the unit from the enclosure. (If it is impractical to place the enclosure on its back, a loudspeaker can be removed by loosening the four mounting screws, swinging the upper clamps out of the way, and then lifting the unit from the lower clamps.) Once a loudspeaker has been lifted a few inches from the baffle panel, the input leads can be disconnected at the terminals on its frame.

*High Frequency*—The high frequency compression driver, model 2440, is bolted to the exponential horn and support bracket; the assembly is then installed in the enclosure. The horn flange fits into a cutout provided on the baffle panel (a white vinyl ring gasket on the horn insures an airtight seal) and the



Support bracket is secured with a clamp to the front-to-rear brace of the 4350 enclosure. Removal is accomplished by unbolting the clamp from the enclosure brace, taking out the four screws extending through the baffle panel to the horn flange, and lifting the driver/horn/bracket assembly from the enclosure. The horn and bracket can then be unbolted from the compression driver. Caution: To avoid the possibility of personal injury, be sure to properly support the driver/horn/bracket assembly while removing the mounting screws holding the horn to the baffle panel, since the assembly weighs approximately 13½ kg (30 lb). To convert the 4350 to right-hand configuration, the high frequency driver/horn/bracket assembly will have to be interchanged with its corresponding cover plate on the right of the baffle panel. (The 2405 ultra-high frequency driver will also have to be interchanged with its respective cover plate, as described in the following paragraphs.) The cover plate is secured behind the baffle panel by four machine screws threaded into T-nuts. The support bracket must be taken off the driver/horn assembly, rotated 180° and reattached to the rear flange of the horn using the original hardware (lockwashers are used under the heads of the two bolts that secure the bracket). The entire assembly can then be installed on the baffle panel and the support bracket clamp bolted to the internal brace on the right side of the enclosure. Finally, install the cover plate behind the horn cutout on the left side of the baffle panel using the screws that held it in its original location.

**Ultra-High Frequency**—The 2405 ultra-high frequency driver is secured through the baffle panel from inside the enclosure and held in place by four machine screws. To achieve the desired dispersion pattern, the unit must be positioned so that the radiation slot is oriented vertically.

When moving the 2405 to the right-hand configuration, the corresponding cover plate on the right side of the baffle panel must be removed and reinstalled behind the opening originally occupied by the ultra-high frequency driver. The cover plate is held in place with four machine screws threaded into T-nuts. The same mounting screws are to be used to install the cover plate on the left side of the baffle panel.

**Wiping Network**—Remove the transducers as previously described, pull the lead wires from the midrange sub-chamber and disconnect the input leads to the dividing network at the tab connectors attached to the input terminals on the back panel, inside the enclosure. The ultra-high frequency level control is mounted on a sub-panel secured to the back of the enclosure baffle panel by two machine screws extending through the panel into threaded fasteners. To gain access to the control, carefully peel off the serialized foil nameplate, remove the mounting screws and place the control assembly on the bottom of the enclosure. The network itself is mounted on the bottom panel of the enclosure and is held in place by six machine screws and

After removing the mounting screws, the network and control assembly can be lifted out of the enclosure through either of the low frequency loudspeaker openings.

Note: Malfunction of the network is highly unlikely. Since the

nameplate generally is destroyed in removal, it is not recommended that the network be removed simply for the purpose of inspection.

**Replacement**—Reverse the removal procedure to replace the system components. Mounting screws for all devices should be tightened evenly and just tight enough to prevent air leaks.

**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. Whenever the horn is removed from the compression driver, the mouth of the driver should be covered with plastic tape. An intense magnetic field exists in the mouth of the driver, and it is extremely important that foreign objects such as iron chips, other metallic contaminants, mounting hardware or tools be kept from the area.**

### Maintenance

The grille cloth is a double-knit polyester fabric selected for acoustic transparency, beauty, physical strength, color fastness and soil resistance. It can be cleaned by gently dusting it with a vacuum cleaner. Stains can be removed by using aerosol cleaners, such as *Texize K2r*, *Goddard's Dry Clean*, or *Pen Champ Quick 'n Easy*, according to each manufacturer's instructions.

**Warning: Cleaning fluids or other solvents should not be used. Although they may appear to remove a stain, liquid cleaners will dissolve the base paint on the grille frame beneath the cloth, resulting in permanent discoloration of the material.**

Occasional dusting with a clean, soft cloth will maintain the finish of the enclosure. Since both the textured gray and oiled walnut surfaces are moisture resistant, a damp cloth will remove most stains. Mild detergent may be used on the gray finish to remove smudges or more persistent stains. Conventional furniture waxes or polishes should not be used; the oiled walnut enclosure, however, may be treated with wax specifically formulated for such surfaces.

The walnut finish may appear to age, or dry out as the oil penetrates deeper and deeper into the veneer. It may, therefore, be desirable to re-oil the enclosure surface from time to time. With each application, the beauty of the finish will become more obvious, and a warm, rich patina will eventually be obtained.

To re-oil a JBL oiled walnut 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 with very fine steel wool (4/0 grade) and applying oil to the entire panel. Very deep scratches, dents or other serious damage should be repaired only by a qualified furniture refinisher.

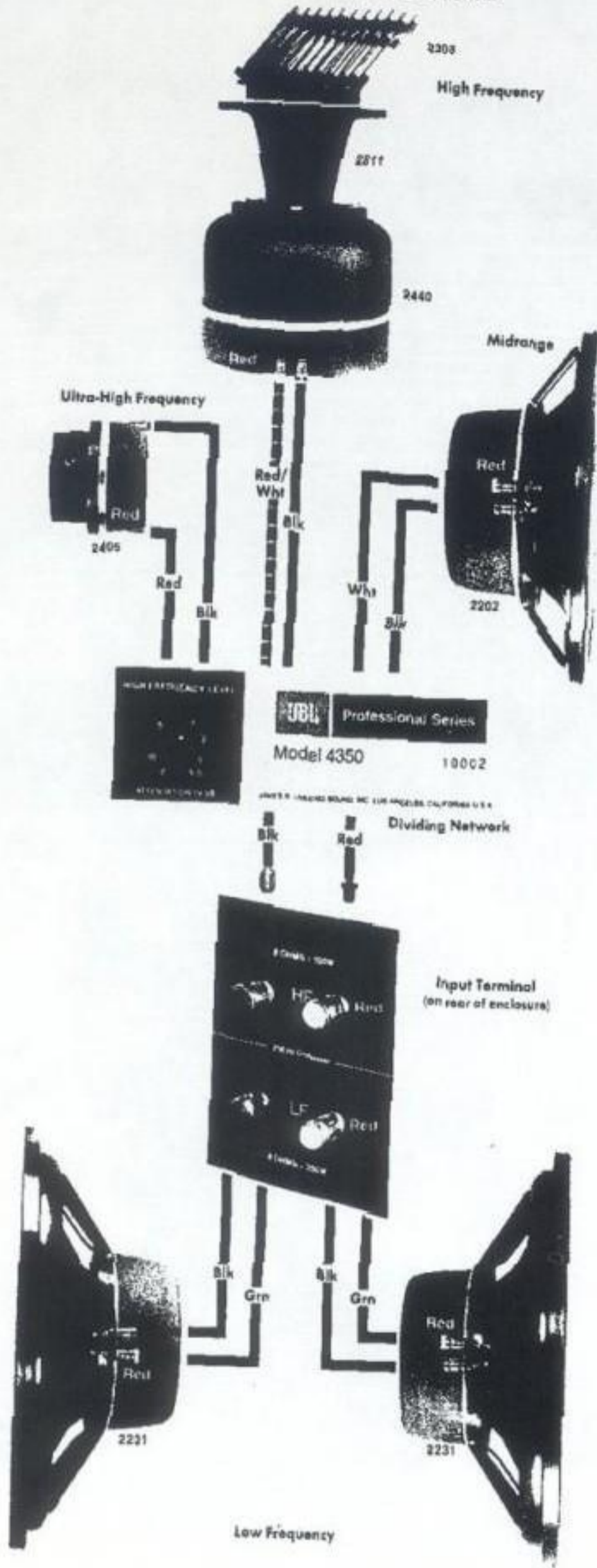
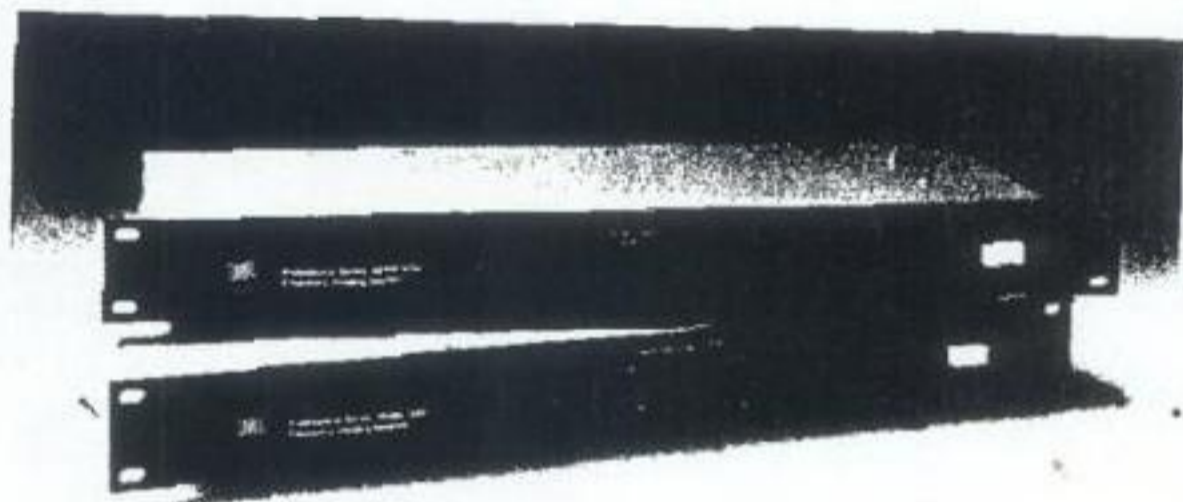
**Caution: Improper storage of wiping rags could result in spontaneous combustion. They should be thrown away or spread out to dry in a well-ventilated area before storage or disposal.**



### Electronic Frequency Dividing Networks

JBL electronic frequency dividing networks are available in two configurations: Model 5233 for single channel operation and Model 5234 for dual channel applications. Performance and operational characteristics of the two models are identical.

Both models are maximally flat second-order electronic crossover networks delivering precise control of the transition by utilizing active filters. They exhibit extremely low noise and operate at output levels capable of driving the power amplifier without distortion. Each channel is equipped with a level control to regulate high frequency output. The crossover frequency is determined by a module inserted in each channel's circuitry. In addition to the 250-Hz crossover card required for use in the 4350, inserts are available for transitions of 500 Hz, 800 Hz, 1.2 kHz, 5 kHz and 7 kHz. A blank card is also available for construction of circuitry to provide other crossover points.



When reconnecting the leads to low frequency loudspeakers or between the other components and the frequency dividing network, the indicated color coding must be observed.

#### Additional Information

JBL maintains a technical staff to answer questions pertaining to professional sound reproduction. Detailed technical information on JBL products is available from the same source. Inquiries may be addressed to the Applications Engineer, Professional Division, James B. Lansing Sound, Inc., 8500 Balboa Boulevard, Northridge, California 91329, U.S.A.

#### Caution

Sound pressure levels produced by the 4350 may cause permanent hearing loss (at half rated power, 115 dB can be generated at six feet). The suggested maximum exposure is 115 dBA for no more than 15 minutes. (U.S. Department of Labor Bulletin #334)