P/N 50657
Owners Manual
$0.26

Professional Series
Technical Manual
Model 4311
Control Monitor

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Professional Division Warranty

Every JBL Professional Series transducer is guaranteed against defects in material and workmanship for a period of five years. JBL electronic products are warranted for a period of two years. JBL will replace defective parts and make necessary repairs under this warranty if our examination reveals evidence of faulty workmanship or material. The warranty does not cover damage caused by misuse, accident or neglect. JBL retains the exclusive right to make such determination on the basis of factory inspection.

Moreover, because we believe that a fine loudspeaker, like a fine musical instrument, should never wear out, we will repair any JBL transducer free of charge without time limitation if factory inspection discloses evidence of an original manufacturing defect.

If it is impractical to return the product to the factory, please write JBL describing the difficulty or malfunction. JBL may, at its option, establish alternative repair procedures or furnish replacement parts as appropriate.

Products returned to the factory must be shipped prepaid and will not be accepted unless written authorization has first been obtained.

The warranty on JBL products shall remain valid only if repairs are performed by JBL or under its authorized procedures, and provided that the serial number on the unit has not been defaced or removed.

Specifications

Power Capacity[1]	75 Watts continuous program
Crossover Frequencies	1500 and 6000 Hz
Nominal Impedance	8 ohms
High Frequency Dispersion	90° horizontal and vertical
Frequency Response	45-15,000 Hz ±3 dB
Sensitivity[2]	42 dB at 30 feet with a 1-mW input averaged 500 to 2500 Hz, with controls set for flattest response
	81 dB at 10 feet with a 1-Watt input, averaged 500 to 2500 Hz, with controls set for flattest response
Low Frequency Loudspeaker	
Nominal Diameter	12 inches 30 cm
Voice Coil	3-inch (7.6 cm) edgewound copper ribbon
Magnetic Assembly Weight	6.75 pounds 3.1 kg
Flux Density	10,400 gauss
Sensitivity[3]	42 dB
Midrange Transducer	
Nominal Diameter	5 inches 13 cm
Voice Coil	⅞-inch (2.2 cm) copper
Magnetic Assembly Weight	2.75 pounds 1.2 kg
Flux Density	16,500 gauss
Sensitivity (averaged 1-3 kHz)	46 dB
High Frequency Direct Radiator	
Nominal Diameter	1.4 inches 3.6 cm
Voice Coil	⅝-inch (1.6 cm) copper
Magnetic Assembly Weight	1.6 pounds 0.7 kg
Flux Density	15,000 gauss
Sensitivity (averaged above 2 kHz)	47 dB
Finish	Textured gray or oiled walnut with black fabric grille
Dimensions	23½" x 14¼" x 11¾" deep 60 x 36 x 30 cm deep
Net Weight	42 lbs 19 kg
Shipping Weight	49 lbs 22 kg

[1] See Installation section for amplifier power recommendation.

[2] Note: Unlike many "theatre type" loudspeaker systems that exhibit a rise in the midrange region, the 4311 is a true monitor providing substantially the same sensitivity through the full range of audible frequencies. Measured sensitivity below 500 Hz or above 2000 Hz may be considerably greater than that of other systems with higher EIA sensitivity ratings.

[3] Since the major portion of the energy reproduced by the low frequency loudspeaker lies below 800 Hz, this specification has been developed by using a test signal warbled from 100 to 500 Hz, rather than the conventional 1-kHz sine wave test signal on which the EIA sensitivity is based.

The 4311 Control Monitor

A product of JBL's long experience and intimate involvement with the recording industry, the 4311 is a powerful, yet compact, monitor loudspeaker system. Its wide-band reproduction at loudness levels required in professional work makes the 4311 ideally suited for control room installations, small studios, mixdown facilities, broadcast monitors and portable playback systems.

Components

Low Frequency—Bass material is reproduced by a powerful, long excursion, 12-inch loudspeaker having a 3-inch diameter edgewound copper ribbon voice coil operating in a magnetic field of 10,400 gauss. The magnetic assembly, energized by an Alnico V magnet, weighs 6.75 pounds; free air resonance is 22 Hz. The surface of the cone is coated with an exclusive damping formulation that provides mass and density to optimize bass performance, prevent spurious resonance and provide smooth performance extending into the midrange region.

Midrange—Transition to the midrange unit is made at a crossover frequency of 1500 Hz. The 5-inch transducer provides clarity and freedom from distortion, even at the high loudness levels encountered in professional applications. The transducer is energized by an Alnico V magnet housed in a closed assembly having a total weight of 2.75 pounds and creating a magnetic field of 16,500 gauss. The ⅞-inch diameter copper voice coil drives a 4-inch, edge-damped cone that operates as a true piston, providing smooth frequency response and wide dispersion throughout its operating range.

High Frequency—Reproduction above 6000 Hz is accomplished by a 1.4-inch direct radiator. Its 1.6-pound magnetic assembly and ⅝-inch diameter copper voice coil drive a cone and center dome with controlled linearity assured by an impregnated cloth termination. The voice coil, suspended in a magnetic field of 15,000 gauss, is unusually large in relation to cone size for efficiency and exceptional transient response. The small cone diameter is responsible for wide, uniform dispersion of high frequency energy; a ring of dense foam surrounds the moving assembly to damp unwanted radiation and reflections.

Dividing Network—The frequency dividing network installed in the 4311 has been designed and tested to achieve the smoothest possible transitions between component loudspeakers. All network components are of the highest quality. Capacitors are non-inductive, non-polarized types with high AC current capacity built expressly for use in dividing networks and individually tested for conformity to rigid performance standards.

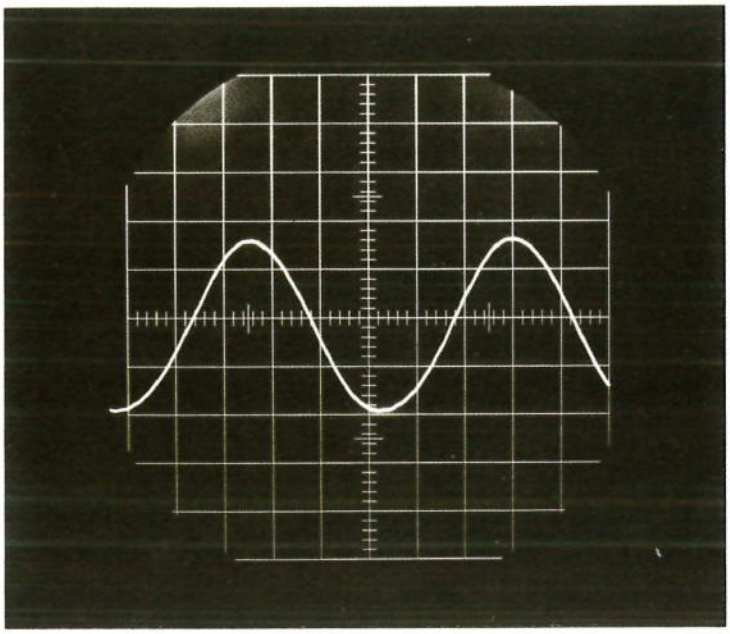
Enclosure—As with all JBL loudspeaker systems, the component transducers, frequency dividing network and enclosure are designed and tested to function as a single, integrated unit. The enclosure is solidly constructed of ¾-inch stock throughout with lock-mitered, wood-welded joints to prevent unwanted resonance. Internal padding absorbs spurious reflections and standing waves. All components mount directly to the baffle panel and are removable from the front of the enclosure. A ducted port provides proper acoustical loading of the low frequency loudspeaker.

Test Parameters

The accompanying graph and specifications were compiled from measurements made under standard laboratory test conditions. The loudspeaker system was mounted flush in the center of a large, flat baffle in an anechoic environment; a calibrated condenser microphone was suspended at a known distance from the sound source, sufficiently far to be safely out of the near field; and all electronic equipment was checked and calibrated before tests were run.

The on-axis frequency response of a typical 4311 does not vary more than ±3 dB from 45 to 15,000 Hz. Due to the wide-angle characteristics of the midrange and high frequency units and their physical orientation, response measured up to 45° off-axis, horizontally or vertically, does not deviate more than 6 dB from on-axis response at 2 kHz nor more than 10 dB at 8 kHz. The 4311's lack of distortion is equally outstanding. Distortion is inaudible even at high power levels and at very low frequencies, as shown in the photo.

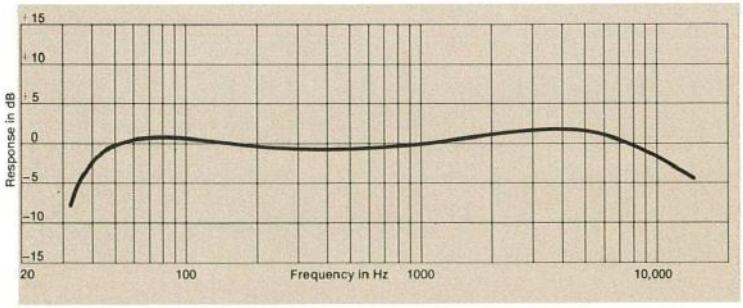
35-Hz Output



This unretouched photo shows the acoustic output of the system when driven by a 50-Watt RMS sine wave signal at 35 Hz. A laboratory microphone was used to pick up the sound from the 4311. The signal from the microphone was connected directly to an oscilloscope and the trace photographed.

Sustained performance at this intensity would not be encountered during normal use. A 50-Watt sine wave represents a far more difficult job for the loudspeaker than its rated capacity of 50 Watts program material, particularly in the very low frequency range. Even so, it can be seen that the 4311 produces an almost perfect sine wave. (Note: Below 50 Hz, most loudspeaker systems produce substantial distortion with an input of only a few Watts.)

Bandwidth—On-Axis



Response contour of system with controls set "flat." (Presence and Brilliance controls each set at "5.") Measured on-axis response of a typical 4311, including all peaks and dips, does not deviate more than 3 dB from the above curve.

Installation

Placement

For optimum source localization within the stereo image, a pair of 4311's should be arranged so that the listening position is centered between the two systems and no more than 30 degrees off-axis horizontally. Vertical orientation should be treated in a similar manner. (Note: Smoothest frequency response will be heard from a listening position 15 degrees off-axis from either unit.) If three or more 4311's 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. If a pair of 4311's are placed horizontally, and fairly close together, a wider stereo perspective will be realized by orienting the enclosures so that the high frequency direct radiators are furthest apart. If physically practical, locating the 4311's so that the high frequency units are near ear level is generally preferable.

System Connection

Input to the 4311 is via spring-loaded terminal posts located on the back of the enclosure. The terminals are color coded to facilitate consistent polarity connection between units in stereo or multi-channel installations. Eighteen gauge insulated wire is the minimum size recommended for connections up to 50 feet. Heavier gauge wire is recommended for greater distances; 16-gauge from 50 to 100 feet and 14-gauge from 100 to 200 feet.

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.

System Adjustment

The frequency dividing network of the 4311 is provided with front panel controls to allow separate regulation of output in the 1500 to 6000 Hz "presence" range and the "brilliance" region above 6000 Hz. Labeled "Presence" and "Brilliance," the controls are continuously variable from maximum to full off, with the flattest response (measured in an anechoic environment) achieved at the midpoints of their travel. With suitable settings of the two controls, the frequency response contour of the 4311 can be altered to compensate for almost any acoustical environment, or to achieve the tonal balance desired. Control scales are clearly marked from 0 to 10, with "5" as their midpoints, so that special settings can be logged and easily reset when needed.

Presence and Brilliance controls are located on the front panel, below the grille. Flattest response, measured in a laboratory environment, will be achieved with both controls set at "5."

Amplifier Power

The 75-Watt continuous program power capacity of the 4311 is indicative of an "average" program level that can be tolerated by the components without damage; however, transients can exceed this level by a considerable margin without danger. To achieve the amplifier power reserve necessary for accurate transient reproduction at high loudness levels, the 4311 may be driven by amplifiers rated up to 150 Watts RMS (per channel). Even larger amplifiers can be employed if normal precautions against input device distortion or amplifier clipping are followed. For portable installations, amplifiers having as little output as 10 Watts RMS (per channel) will drive the 4311 to useable volume levels.

Component Removal

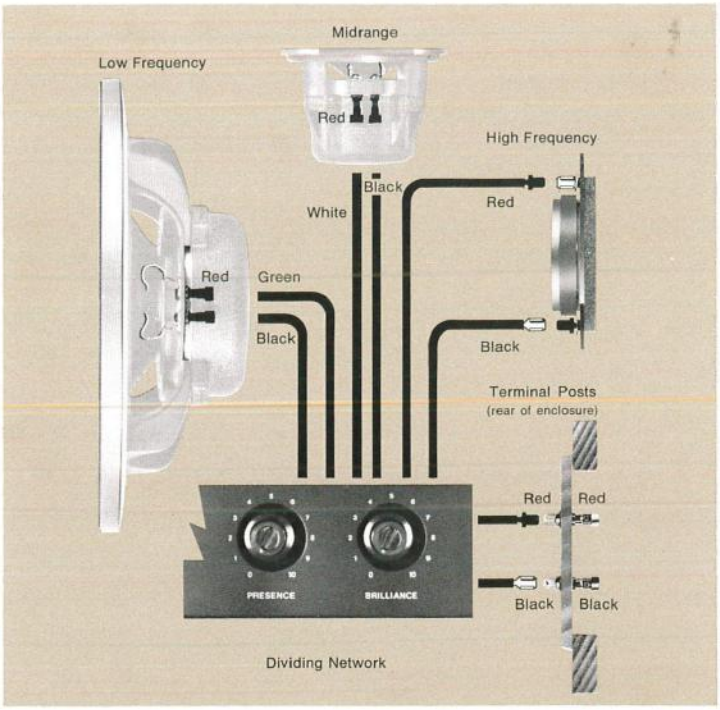
To optimize the sound dispersion characteristics of the loudspeaker system, maintain the acoustical integrity of the enclosure and facilitate inspection and service, all components mount directly to the baffle panel and are removable from the front of the enclosure.

Grille—The grille is secured to the enclosure by hook-and-pile mounting tape at each corner of the assembly. To remove the grille, grasp it at the bottom edge and gently lift it from the enclosure. To replace the grille, reposition it on the enclosure and apply light pressure at the corners.

Low Frequency—The low frequency loudspeaker is mounted with four Phillips-head screws threaded into T-nut fasteners which are anchored on the back of the baffle panel. After placing the enclosure on its back on a clean, padded surface, carefully unscrew the mounting screws without applying pressure that might dislodge the T-nuts. When the screws have been removed, gently lift the edge of the loudspeaker frame from the baffle panel, disconnect the wires at the terminals and remove the loudspeaker from the enclosure.

Midrange and High Frequency—The midrange transducer is held in place by four self-tapping screws at each corner of its frame. Carefully remove the screws, lift the unit from the enclosure and disconnect the leads at the terminals. The high frequency direct radiator is mounted in a similar manner, with the exception that its input is via tab connectors.

Dividing Network—The dividing network is mounted to the rear of the baffle and held in place by machine screws extending through the front of the panel. To gain access to the network, remove the transducers, pull the wire leads from the midrange sub-chamber, disconnect the leads at the tab connectors on the input terminals at the back of the enclosure, carefully peel back the foil nameplate which conceals the two mounting screws, remove the screws and lift the network out through the low frequency loudspeaker opening. Note: Malfunction of the network is highly unlikely. Since the nameplate is generally destroyed during removal, it is not recommended that the network be removed simply for the purpose of inspection.



When reconnecting the wire leads between the network, input terminals and high frequency direct radiator, proper polarity is assured by the connectors. Connections to the other components are color coded as shown.

Replacement – Reverse the removal procedure to replace the system components. Mounting screws should be tightened evenly and just enough to avoid air leaks between the components and the enclosure.

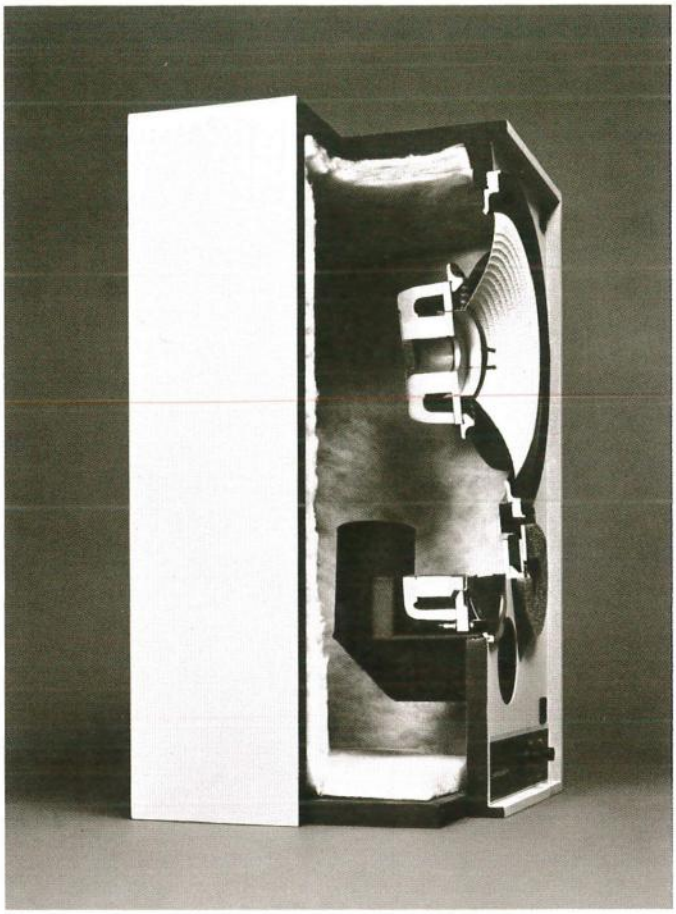
Maintenance

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.



Interior view of the 4311.

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 out 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.

Additional Information

JBL maintains a technical staff to answer questions pertaining to professional sound reinforcement. 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., 3249 Casitas Avenue, Los Angeles, California 90039.

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 is always warranted to equal or exceed the original design specifications unless otherwise stated.

Professional Division

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