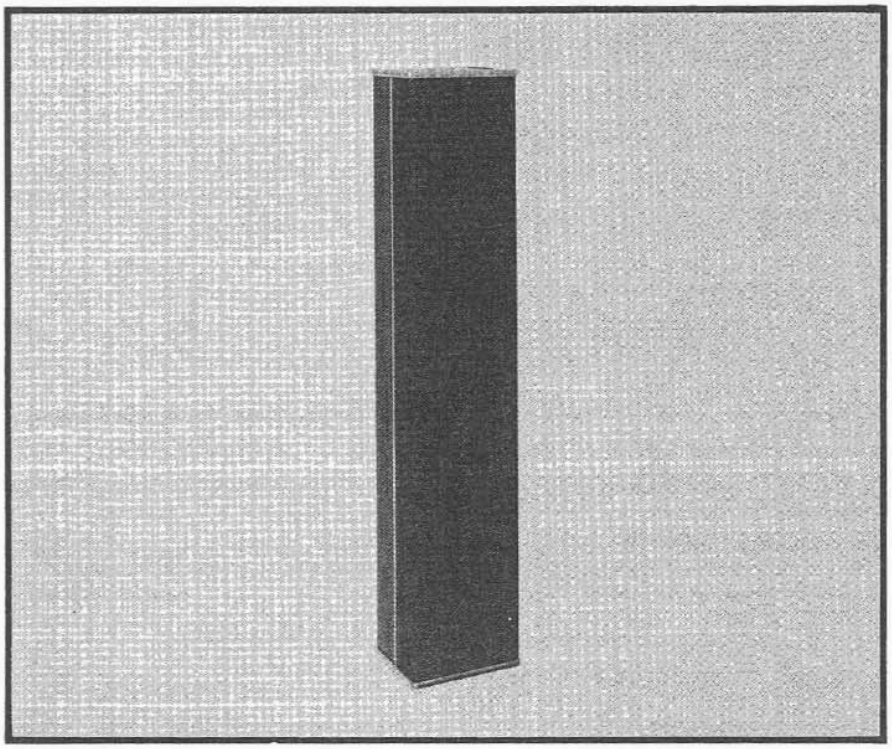

Electro-Voice®
a MARK IV company

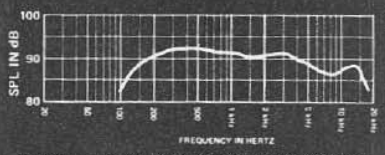

FIGURE 1 – Axial Frequency Response 4 volts/10 feet

LR4B
All Weather Line Radiator™

SPECIFICATIONS

Usable Frequency Response, 10 Feet on Axis, Half-Space Anechoic Environment (Figure 1):
100-18,000 Hz

Long-Term Average Power Handling Capacity per EIA Standard RS-426A (see Power Handling Capacity section):
100 watts

Maximum Long-Term Woofer Acoustic Output:
1.5 watts

Axial Sound Pressure Level at 1 Meter, 1 Watt Input, Anechoic Environment, Band-Limited Pink Noise Signal, 300-2,000 Hz:
98 dB

Nominal Dispersion Angle Included by 6-dB-Down Points on Polar Responses, Indicated One-Third Octave Bands of Pink Noise, 1,000-16,000 Hz Median,
Horizontal (see Figures 2, 3):
120°
Vertical (see Figures 2, 3):
60°

Directivity Factor R_Q (Q), 500-16,000 Hz Median (see Figure 4):
6

Directivity Index D_i, 500-16,000 Hz Median (see Figure 4):
8 dB

Transducer Complement,
High-Frequency:
ST350B, 120° constant directivity tweeter
Low-Frequency:
Six 5 x 7-inch loudspeakers

Crossover Frequency:
3000 Hz

Crossover Slope:
12 dB per octave

Impedance (Figure 5),
Nominal:
8 ohms
Minimum:
8 ohms

Input Connections:
Screw terminals (#8-32) on insulating strip (T1 positive and T2 negative)

Enclosure Materials and Colors:
Utility black finish on plywood sides and top with particle board back. Grille is perforated metal in front of a foam water barrier

Mounting:
Mounting accessories consisting of "S" hooks, hinge and chain supplied (see Figure 6)

Dimensions:
122 cm (48 in.) high
24.8 cm (9.75 in.) wide
19.0 cm (7.50 in.) deep

Optional Accessory:
TM 60-watt 25-volt/70.7 volt line transformer

Net Weight:
18 kg (40 lb)

Shipping Weight:
20.4 kg (45 lb)

DESCRIPTION

The Electro-Voice LR4B Line Radiator™ is a two-way "column" format loudspeaker system intended for indoor and outdoor applications. It contains a vertical array of 5 x 7-inch elliptical low-frequency loudspeakers used in conjunction with an ST350B constant directivity radial horn tweeter. The tweeter is afforded an extra measure of protection through the use of an automatically resettable relay form of tweeter protector. The 5 x 7-inch loudspeakers are mounted on a multi-faceted baffle designed to make vertical sound coverage more uniform and controlled at midrange frequencies. Above 3000 Hz the ST350B constant directivity horn tweeter is used to confine radiation to a zone of 60° vertical by 120° horizontal extent which complements and extends the coverage zone of the 5 x 7-inch units. This sophisticated system format means high-fidelity sound quality in conjunction with the forward-directed form of uniform sound coverage associated with a column system. The wide frequency range, relatively high sensitivity (98 dB 1 watt at 1 meter) and 100 watt input capacity further add to the usability of the LR4B in solving difficult sound reinforcement problems. The compact and elongated shape of the system additionally makes it inconspicuously fit into many vertically-oriented environments.

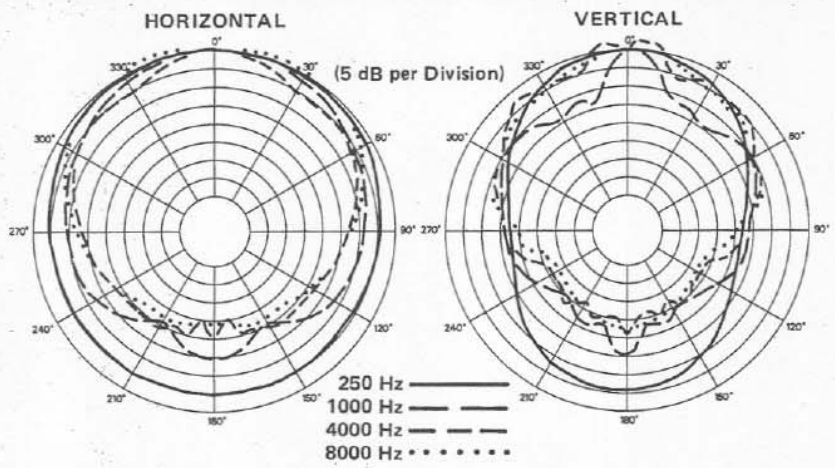

FIGURE 2 – Polar Response (1/3 octave pink noise 4 volts/10 feet)

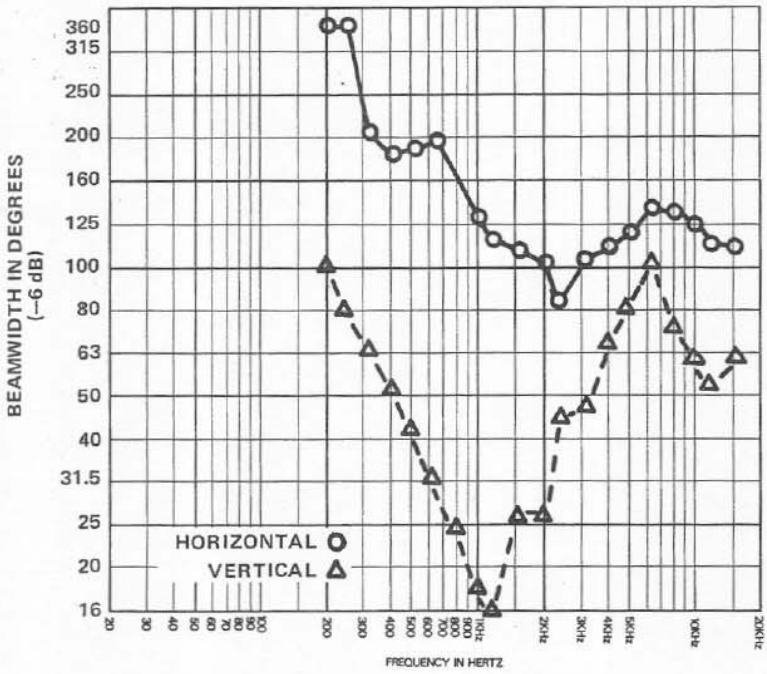

FIGURE 3 – Beamwidth vs Frequency Whole Space (anechoic)

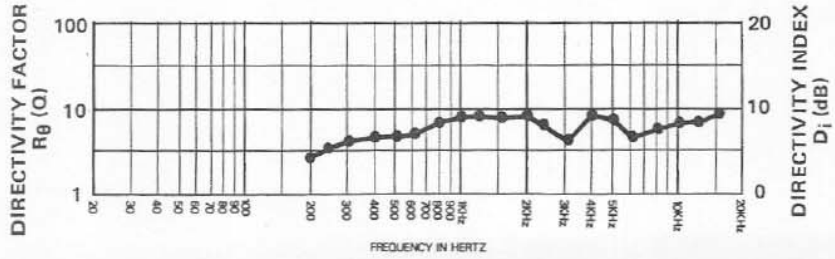

FIGURE 4 – Directivity vs Frequency Whole Space (anechoic)

WHY LINE RADIATOR LOUDSPEAKER SYSTEMS?

Line Radiator or column format systems may be thought of as "stretched" or elongated forms of more conventional loudspeaker system shapes. This elongation carries with it several properties which are desirable in certain applications.

The first property involves the directional characteristics associated with elongated acoustical sources. The most efficient applications of Line Radiators are those which take advantage of this characteristic. When mounted vertically, the broad horizontal coverage pattern aids in covering large audiences while the more limited vertical coverage makes projection possible over longer distances without unwanted reflections from floors or ceilings. In addition, when mounted above a sound system's microphone, line radiators are capable of covering the audience without the troublesome acoustic feedback to the microphone which often accompanies less sophisticated reproducers. Since most of the output is projected forward and comparatively little is allowed to come from the ends, a microphone placed under the Line Radiator will receive much less direct sound than if similarly placed with respect to other loudspeakers. This can greatly reduce or eliminate feedback.

Another useful property involves the visual aspects of a Line Radiator. The thin elongated shape often integrates well into the architecture surrounding it. This is especially true if the architecture has strong vertical accents which tend to make the system blend into the surroundings. In some situations, the shape alone may be sufficient reason for selection of this type of system.

FREQUENCY RESPONSE

The combination of six integrated elliptical low-frequency loudspeakers, constant directivity tweeter and equalized crossover results in the wide and smooth overall response shown in Figure 1. This response is 1/3-octave averaged, no external equalization was used.

DIRECTIVITY

Unique features of the LR4B are the multi-faceted layout of the elliptical loudspeakers and the incorporation of the constant directivity ST350B tweeter for directional control. The polar response of the system is shown in Figure 2. These polar responses were

measured in an anechoic environment using 1/3-octave pink noise inputs. The frequencies selected are fully representative of the polar response of the system. Beamwidth of the system utilizing the complete 1/3-octave polar data is shown in Figure 3. R_θ (Q) and directivity index (D_i) are plotted in Figure 4.

POWER HANDLING CAPACITY

To our knowledge, Electro-Voice was the first U.S. manufacturer to develop and publish a power test closely related to real-life conditions. First, we use a random noise input signal because it contains many frequencies simultaneously, just like real voice or instrument program. Second, our signal contains more energy at extremely high and low frequencies than typical actual program, adding an extra measure of reliability. Third, the test signal includes not only the overall "long-term average" or "continuous" level – which our ears interpret as loudness – but also short-duration peaks which are many times higher than the average, just like actual program. The long-term average level stresses the speaker thermally (heat). The instantaneous peaks test mechanical reliability (cone and diaphragm excursion). Note that the sine wave test signals sometimes used have a much less demanding peak value relative to their average level. In actual use, long-term average levels exist from several seconds on up, but we apply the long-term average for several hours, adding another extra measure of reliability.

Specifically, the LR4B is designed to withstand the power test described in the revised EIA Standard RS-426A. The EIA test spectrum is applied for eight hours. To obtain the spectrum, the output of a white noise generator (white noise is a particular type of random with equal energy-per-bandwidth in Hz) is fed to a shaping filter with 6-dB-per octave slopes below 40 Hz and above 318 Hz. When measured with the usual constant-percentage bandwidth analyzer (one-third octave), this shaping filter produces a spectrum whose 3-dB-down points are at 100 Hz and 1200 Hz with a 3-dB-per octave slope above 1200 Hz. This shaped signal is sent to the power amplifier with the continuous power set at 100 watts into the 8 ohms EIA equivalent impedance (28.3 volts true RMS). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 400 watts peak (56.6 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

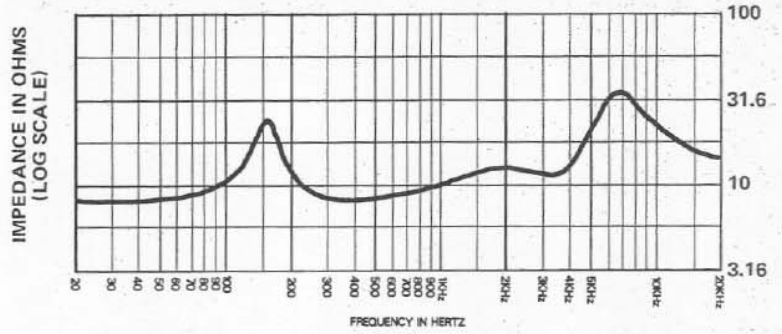

FIGURE 5 – Impedance vs Frequency

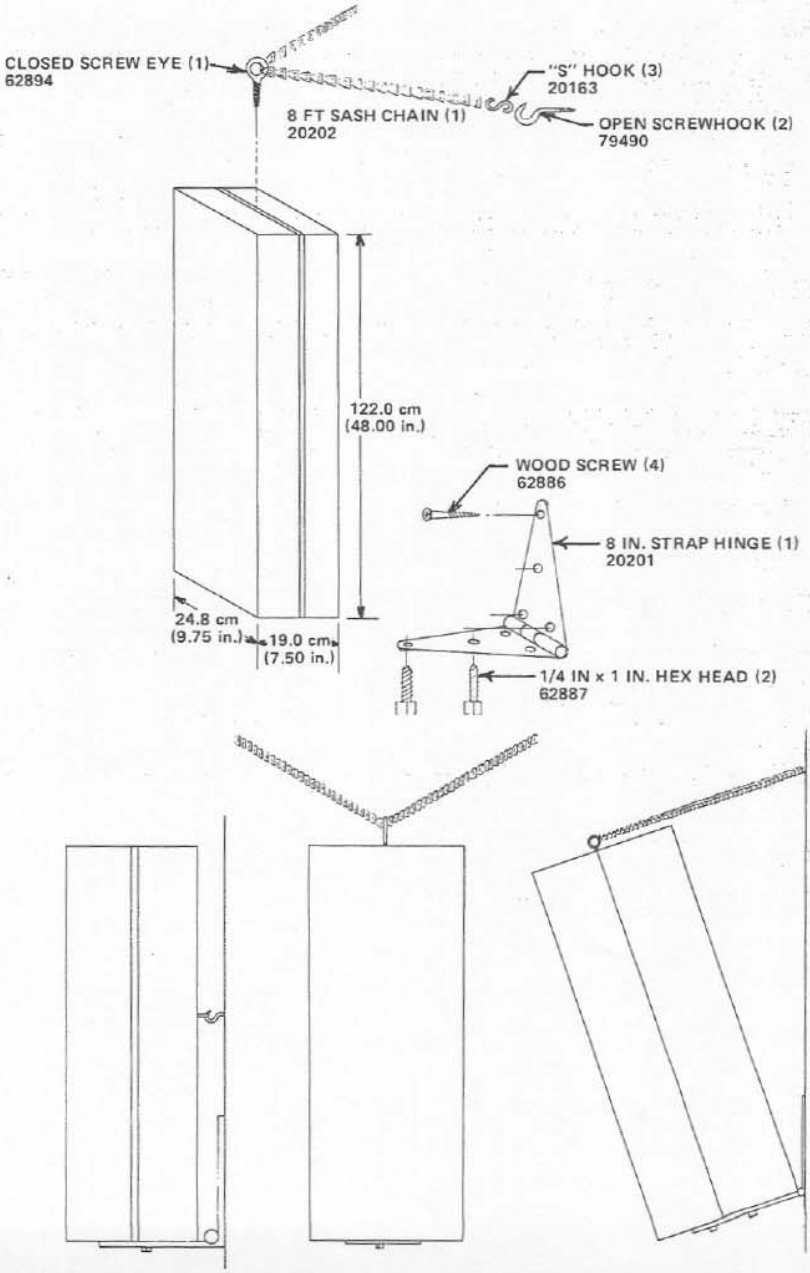

FIGURE 6 – Dimensions and Mounting

MOUNTING

The Model LR4B can be installed with the 8-inch strap hinge and chains supplied. Figure 6 illustrates how the hinge may be used. The hinge may be attached to the base of the LR4B and to the surface on which the unit is to be mounted such as a wall, ledge, arch, or ceiling. Lag bolts are supplied which can be directly screwed into the cabinet of the LR4B. With the materials supplied and a little ingenuity and creativity the LR4B may be mounted on almost any kind of surface and in any position.

For further information about system applications refer to the Electro-Voice publication, "The Electro-Voice Guide to Commercial Sound Reinforcement and Public Address Systems," available without charge by writing: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107.

PAINTING THE SYSTEM

The LR4B may be painted to match any decor. The enclosure should be spray painted with a lacquer based paint, making certain not to get paint on the speakers. The metal grille may be painted with enamel using a roller. Special care should be taken not to paint the foam lining, as it can adversely affect the performance of the system.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The loudspeaker shall be a multi-faceted straight Line Radiator type using 6 5 x 7-inch cone speakers and a constant directivity ST350B tweeter. The speakers shall be housed in a weather-sealed wooden enclosure with black utility painted finish. A metal grille shall be provided on the front of the Line Radiator for physical protection as well as protection from the weather. Overall size shall be 122 cm (48 in.) x 24.8 cm (9.75 in.) x 19 cm (7.50 in.). Frequency response shall be uniform from 100 to 18,000 Hz. Nominal dispersion angles included by 6-dB-down points using one-third octave bands of noise shall be 120° (horizontal) and 60° (vertical) in the 1000 to 16,000 Hz range. Axial sound pressure level at one meter, one watt input under anechoic conditions using 300-2000 Hz band-limited pink noise shall be 98 dB. Nominal impedance shall be 8 ohms. Net weight shall be 18 kg (40 lb). The Electro-Voice Model LR4B is specified.

WARRANTY (Limited)

Electro-Voice Loudspeakers, Speaker Systems, and accessories are guaranteed for five years from date of original purchase against malfunction due to defects in workmanship and materials. If such malfunction occurs, unit will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Unit will be returned prepaid. Warranty does not cover finish or appearance items or malfunction due to abuse or operation at other than specified conditions. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

For shipping address and instructions on return of Electro-Voice products for repair and locations of authorized service agencies, please write: Service Department, Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (Phone: 616/695-6831) or Electro-Voice West, 8234 Doe Avenue, Visalia, California 93277 (Phone: 209/651-7777).

Electro-Voice also maintains complete facilities for non-warranty service.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil St., Buchanan, Michigan 49107.

Specifications subject to change without notice.

ELECTRO-VOICE, INC., 600 Cecil Street, Buchanan, Michigan 49107
MANUFACTURING PLANTS AT ■ BUCHANAN, MI ■ NEWPORT, TN ■ SEVIERVILLE, TN ■ REDMOND, WA ■ GANANOQUE, ONT
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