



DESCRIPTION AND APPLICATIONS

The Electro-Voice Model FR150 Reentrant Horn was developed to provide the new low silhouette of a rectangular horn at lowest possible cost. Featuring medium dispersion, this horn can be used where moderate coverage angles are encountered. The horn may be oriented vertically, or horizontally for best sound control and maximum efficiency. The FR150 can be used in factories, parks, playgrounds, outdoor meetings, athletic fields, fairs, and is ideal for car-top mobile systems.

Exceptionally wide range and smooth response is achieved by careful design of the one piece die-cast reentrant tubes and fiberglass outer horn. This design includes the exclusive Electro-Voice ring reflector to extend useful high frequency response for clearer voice projection and more pleasant musical balance. Best results are obtained with any of the new Electro-Voice Convertible Drivers, which combine wide range and low distortion with reliability and high efficiency. In addition, any standard driver with 1-3/8"-18 threads can be accommodated.

Unlike rectangular diffraction horns, the FR150 utilizes a single relatively large horn for all frequencies. Best spreading of the higher tones occurs with the horn mounted horizontally. Slightly wider bass dispersion is achieved with the horn mounted vertically. Horizontal mounting is recommended for the majority of applications.

The FR150 horn is assembled to a rugged die-cast mounting plate and supported by a heavy "U" bracket. The large horn plus long reentrant tubes assures optimum low frequency response. Several FR150 horns can be placed side by side to concentrate coverage, increase low frequency response and increase sound level.

SPECIFICATIONS

Low Frequency Cutoff:	150 Hz
Taper Rate:	150 Hz
Air Column Length:	3ft., 9 in.
Horizontal Dispersion at 1000 Hz,	
Horn Vertical:	70°
Horn Horizontal:	100°
Construction:	Molded Fiberglass horn, die-cast reentrant tubes and mounting plate
Mounting:	Steel "U" bracket (may be oriented vertically or horizontally)
Finish:	Mesa Tan baked enamel on metal parts—matches color molded in horn
Size (less driver):	20½"h. x 10½"w. x 21" d.
Weight:	9 lbs., 8 oz.

INSTRUCTIONS

The Model FR150 is normally shipped with the horn adjusted for vertical orientation of the speaker. The horn may be rotated 90° for control of dispersion. 70° horizontal coverage is obtained with the horn vertical. 100° horizontal coverage is obtained with the horn horizontal. To reorient horn, remove the four hex head bolts from the rear of the mounting plate, thus allowing the reentrant tube structure to separate from the horn and mounting plate. The mounting plate and tubes should be rotated 90° and the horn reassembled. Care should be exercised to avoid breaking the cement seal which assures exactly vertical or horizontal alignment of the horn to the bracket. Bolts should be firmly tightened. Loosen the two large hex head bolts on each side of the mounting plate and adjust the "U" bracket to proper angle, then retighten. It may be more convenient to completely remove the "U" bracket and mount it in place, then

reassemble horn to bracket. Finally install the driver on horn and make electrical connection to driver. If E-V convertible driver is used, be sure plastic damping plug is inserted and threaded cap is tightly in place on rear port of driver. Failure to use these items may result in peaked response and poor bass response.

The speaker should be carefully directed toward the area to be covered by sound. You will note that this horn becomes increasingly directional at higher frequencies. Best understanding of speech and best musical balance will be obtained in the area directly in front of the horn. The horn is also loudest "on-axis". Avoid pointing the speaker directly at "hard" highly reflective walls since increased reverberation and acoustical feedback may result. If possible, locate microphones away from the direct sound from the speaker.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The horn shall be a reentrant trumpet with outer housing molded of one piece fiberglass reinforced polyester resin. The mouth shall be $20\frac{1}{2}'' \times 10\frac{1}{2}''$ and the depth, less driver, 21". The reentrant tubes shall be one-piece die cast and the mounting plate also shall be die cast. It shall be possible to orient the horn either vertically or horizontally. Air column length shall be 3 ft., 9 inches and the rated taper and cut off shall be 150 Hz. Dispersion shall be 70° vertical by 100° horizontal when the wide dimension of the horn is horizontal. The horn shall accept any driver having 1-3/8"-18 threads. The finish shall be Mesa Tan molded into the fiberglass horn and shall be baked enamel on metal parts. Weight shall not exceed $9\frac{1}{2}$ lbs. Electro-Voice Model FR150 is specified.

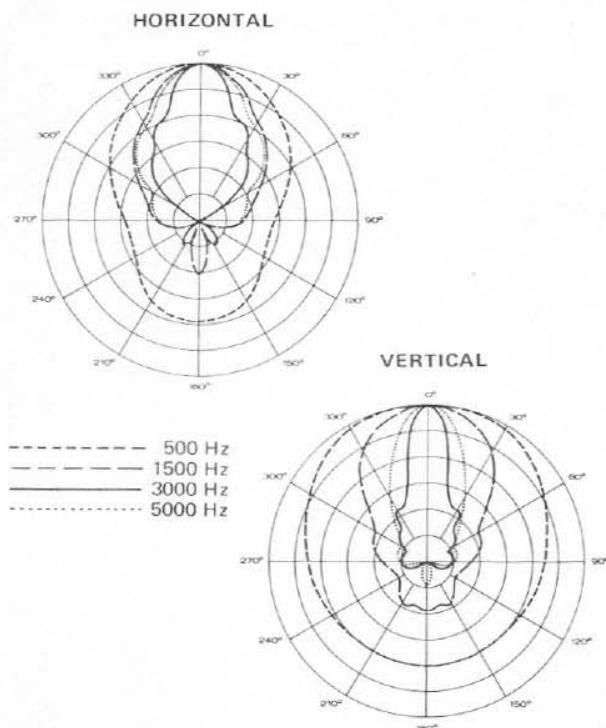


FIGURE 1 — Polar Patterns

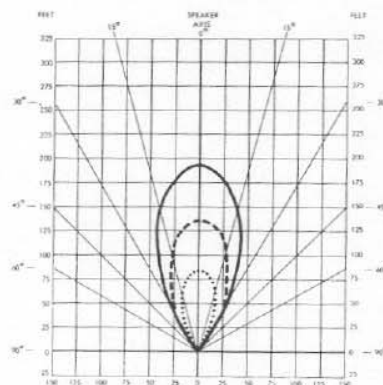
DISPERSION AND EFFICIENCY CHARACTERISTICS

The accompanying polar patterns show the distribution of sound at various frequencies. Note that the radial scale is measured in dB's so that the shape of the pattern indicates relative loudness at all angles at a constant distance from the speaker. Each frequency has been adjusted to the same loudness on axis for this test.

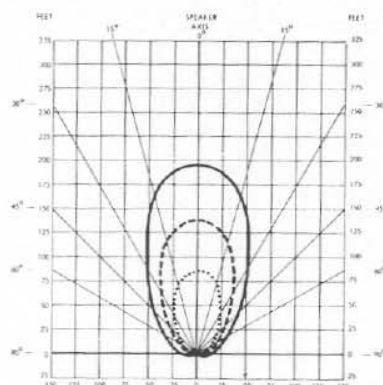
CONSTANT LOUDNESS CONTROLS

The accompanying figures indicate the distance you can stand from the FR150 when an E-V driver is operated at half rated power to achieve a typical sound level of 90 dB. Unlike the polar pattern, the graph is plotted in distance. The constant loudness contour is measured at about 3000 Hz to assure that full articulation of speech is achieved anywhere on or inside the contour line. This does not mean that there will be no sound outside the constant loudness line, but merely that the loudness at 3 KHz will be below 90 dB and intelligibility may suffer. Reference to the polar pattern will indicate the relative loudness of other frequencies at any point. The nominal dispersion of the speaker is based on the loudness "balance" of all frequencies at various angles. This is a subjective measurement and may vary with individual applications.

LONG AXIS VERTICAL



LONG AXIS HORIZONTAL



— with DC50 (25w input)
 --- with DC40 (20w input)
 with DC30A (15w input)

Frequency = 3000 Hz (nominal)
 Level = 90 dB (constant)

FIGURE 2 — Constant Loudness Contours

Although a 90 dB reference level has been selected, some other sound level may be required. The following table gives the conversion factor for several other levels. For sound level of:

60 dB multiply distance by 32.0
70 dB multiply distance by 10.0
80 dB multiply distance by 3.2

For sound level of:

100 dB divide distance by 3.2
110 dB divide distance by 10.0
120 dB divide distance by 32.0

For sound pressure level of 90 dB at full rated power, multiply distance shown by 1.4.

Two useful formulas can help you use these charts and specifications.

1. Every time you double amplifier power into a driver, the sound pressure level at any point will be increased 3 dB. Conversely, if amplifier power into the speaker is cut in half (from 30 watts to 15 watts, for instance) the sound pressure level will be reduced by 3 dB.

2. Every time you double the distance from the listener to the speaker, the sound pressure level at the listener will be reduced by 6 dB. This is equivalent to having only $\frac{1}{4}$ the amount of power available at the more distant position.

NOTE: The above statements refer to outdoor systems where no sound reinforcing reverberation affects the efficiency of the system. On indoor sound systems, reflections from walls will tend to reinforce the sound level thus reducing the effects noted above. The smaller the room, the less effect distance will have on loudness. Highly reflective wall surfaces (i.e. tile, glass, stone, etc.) will further reduce the loudness difference. These reflections, however, may reduce intelligibility by creating a "garbled" or echo effect.

WARRANTY (Limited) —

Electro-Voice Sound Reinforcement & Public Address Loudspeakers 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 instructions on return of Electro-Voice products for repair by authorized service agencies, please write: Service Department, Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (Phone: 616/695-6831).

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

Specifications subject to change without notice.