

**Electro-Voice®**

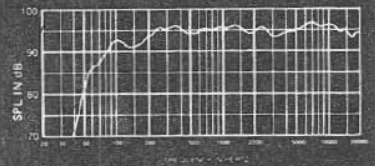


FIGURE 1 - Axial Frequency Response 4 volts/10 feet

## Model SH-1502ER Horn-Loaded Stage Speaker System

### SPECIFICATIONS

Frequency Response, 10 Feet on Axis,  
Swept 1/3-Octave, Half-Space Anechoic  
Environment (see Figure 1):

62-20,000 Hz

Low-Frequency 3-dB-Down Point:

62 Hz

Usable Low-Frequency Limit

(10-dB-down point):

46 Hz

Half-Space Reference Efficiency:

4.1%

Long-Term Average Power Handling

Capacity per EIA Standard RS-426A

(see Power Handling Capacity section):

200 watts

Maximum Woofer Acoustic Output:

8.2 watts

Sound Pressure Level at 1 Meter,

1 Watt Input, Anechoic Environment,

Band-Limited Pink-Noise Signal,

300-2,000 Hz:

102.5 dB

Dispersion Angle Included by

6-dB-Down Points on Polar Responses,

Indicated One-Third-Octave Bands

of Pink Noise,

250-20,000 Hz Horizontal

(see Figure 3):

110° ± 5°

5,000-10,000 Hz Vertical

(see Figure 3):

46° ± 5°

Directivity Factor  $R_\theta$  (Q), 800-16,000 Hz

Median (see Figure 4):

11.0 (+3.5, -4.5)

Directivity Index  $D_i$ , 800-16,000 Hz Median

(see Figure 4):

10.5 dB (+1 dB, -2.5 dB)

Distortion, 0.1 Full Power Input

Second Harmonic,

100 Hz: 3%

1,000 Hz: 1%

10,000 Hz: 14%

Third Harmonic,

100 Hz: 1%

1,000 Hz: <1%

10,000 Hz: 4%

Distortion, 0.01 Full Power Input

Second Harmonic,

100 Hz: <1%

1,000 Hz: <1%

10,000 Hz: 5%

Third Harmonic,

100 Hz: <1%

1,000 Hz: <1%

10,000 Hz: 1%

Transducer Complement,

High-Frequency:

DH-2010A

90° × 40° constant-directivity

horn

Low-Frequency:

EVG-15

Box Tuning Frequency:

55 Hz

Crossover Frequency:

1,600 Hz

Crossover Slope:

12-dB-per-octave

Impedance,

Nominal:

8 ohms

Minimum:

6.6 ohms

Input Connections:

Parallel 1/4-in. phone jacks (allows

paralleling of multiple speakers)

Enclosure Materials and Colors:

Black carpet covered Road-Wood™

Dimensions:

81.0 cm (31.9 in.) high

62.7 cm (24.7 in.) wide

40.6 cm (16.0 in.) deep

Net Weight:

36.7 kg (81 lbs)

Shipping Weight:

40.0 kg (88 lbs)

Optional Accessories:

SMK-1 stand-mounting kit

100BK speaker stand

### DESCRIPTION

The Electro-Voice SH-1502ER is a 200-watt, two-way, high-efficiency, constant-directivity stage system featuring a vented, horn-loaded woofer section. It combines professional quality components arranged in a vertical array with an unusually durable enclosure. The result is wide-range, accurate sound reproduction with transparent highs and "punchy" bass response.

The enclosure is constructed of Road-Wood™ a structural material made of layered and selectively oriented hardwood strands strongly bonded together with phenolic resins. This high-strength shell is covered with densely woven, abuse-resistant black carpeting.

The high-frequency section of the SH-1502ER utilizes a 90° × 40° constant-directivity horn driven by a one-inch throat, wide-bandwidth, titanium diaphragm driver. This driver uses a unique convex drive Time Path™ phasing plug structure (U.S. Patent #4,525,604) for smooth and extended high-frequency performance.

The bass section of the SH-1502ER is designed as a vented-horn format of system for a projected midrange sound quality combined with low-frequency performance extending to below 60 Hz. The new Electro-Voice EVG-15, 15-inch woofer features an extended length voice coil and high-temperature construction materials.

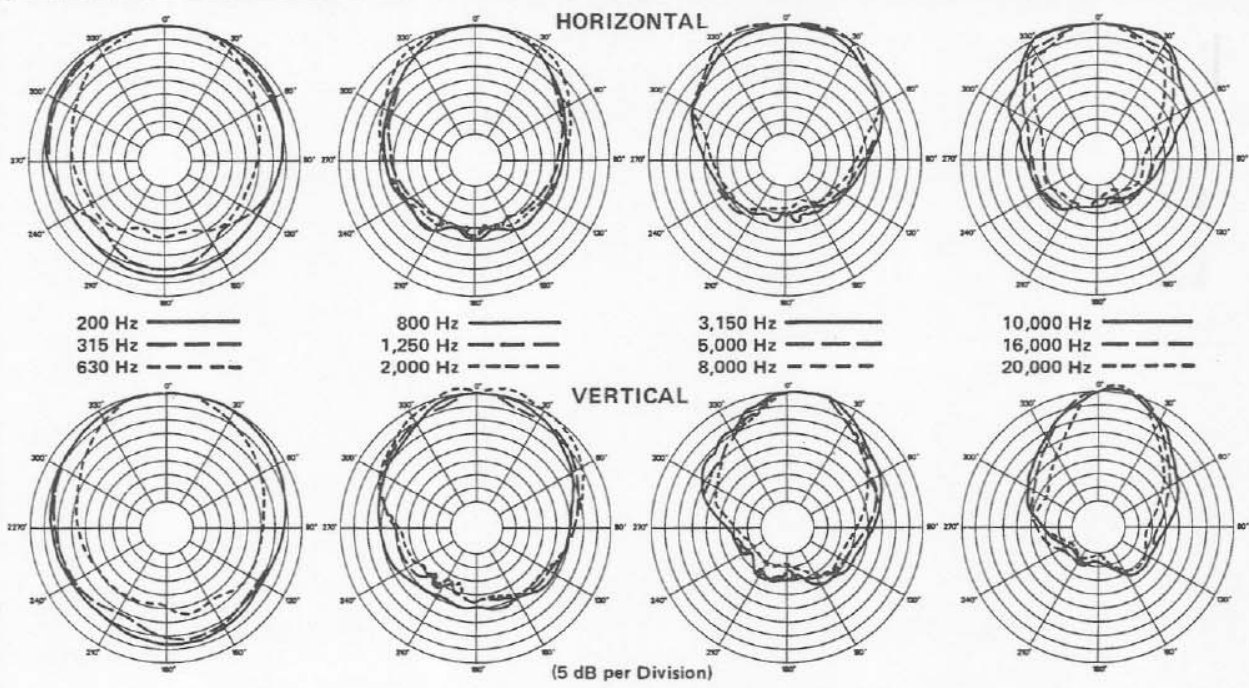


FIGURE 2 – Polar Response (1/3 octave pink noise 4 volts/10 feet)

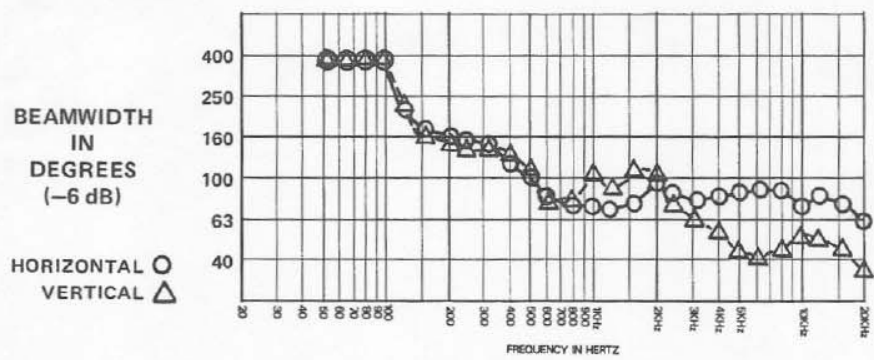


FIGURE 3 – Beamwidth vs Frequency Whole Space (anechoic)

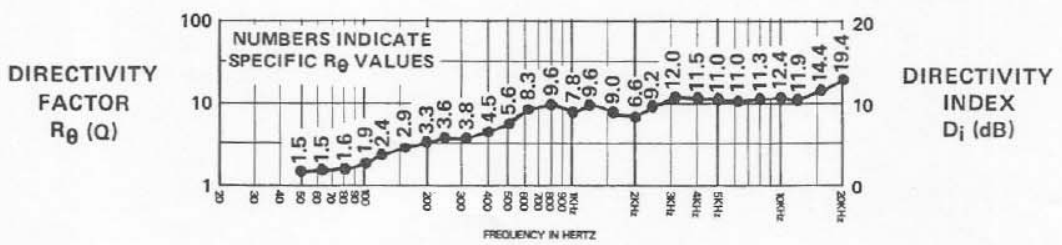


FIGURE 4 – Directivity vs Frequency Whole Space (anechoic)

### CONSTANT-DIRECTIVITY SPEAKER SYSTEM

The crossover frequency and speaker component geometries have been selected so that the directional characteristics of the woofer and constant-directivity horn match at the crossover frequency (approximately 90° circular coverage patterns for each) to create a special system type — the constant-directivity system. At higher frequencies the horizontal coverage pattern remains constant and the vertical pattern smoothly transitions to a 40° to 50° angle above 5,000 Hz. Response within the 90° x 40° rated coverage angle is uniform, which means dependable audience coverage without "hot spots" or dead zones at certain frequencies. The 90° x 40° dispersion characteristic also helps avoid early reflections from nearby floor or side wall surfaces which could degrade performance. The controlled directivity of the high and low-frequency transducers also eliminates response irregularities caused by diffraction off nearby enclosure edges.

### ENCLOSURE CONSTRUCTION

The SH-1502ER enclosure utilizes a structural material that combines the strength of high-quality plywood with the density and acoustic damping of particle board without brittleness. Road-Wood™ uses the same principle of crossbanding veneers, as in plywood, in order to achieve its very high rigidity. A tough liquid-phenolic resin is blended with long, narrow strands of hardwood. Alternate layers are perpendicularly bonded under intense heat and pressure to form panels of superior uniformity. Unlike many grades of plywood, Road-Wood is dimensionally stable, water resistant and free from voids.

A combination of dado-cut joints, tough adhesives and proper bracing ensure a sonically dead enclosure free from panel resonances.

The densely-woven, industrial-grade, abuse-resistant carpeting provides a finish that is both attractive and highly durable. Large, heavy-duty metal corner protectors, firmly secured rubber feet and recessed handles complete the picture and ensure that the SH-1502ER speaker system is ideally suited to a long and reliable life "on the road."

### FREQUENCY RESPONSE

The combination of a 15-inch woofer, wide-bandwidth, high-frequency driver and an equalized crossover results in the wide and smooth overall response shown in Figure 1. This response was measured at 10 feet, using a 4-volt input in an anechoic chamber, and was measured using swept 1/3-octave. No external equalization was used.

### DIRECTIVITY

A unique feature of the SH-1502ER is the constant-directivity dispersion provided by the 90° x 40° horn. The polar response of the system at selected 1/3-octave bandwidths is shown in Figure 2. These polar responses were measured in an anechoic environment at 10 feet 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.  $R_p(Q)$  and directivity index (DI) 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 SH-1502ER is designed to withstand the power test described in 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 noise 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 1,200 Hz with a 3-dB-per-octave slope above 1,200 Hz. This shaped signal is sent to the power amplifier with the continuous power set at 200 watts into the 6.0 ohms EIA equivalent impedance, (34.6 volts true RMS). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 800 watt peak (69.2 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

### STAND MOUNTING

The SH-1502ER can be mounted on the 100BK speaker stand, or any other stand with a 1 3/8-inch diameter shaft, by installing the optional SMK-1 stand-mounting accessory kit (available from Electro-Voice). The kit consists of a flush-mount insert and four mounting bolts. Instructions for mounting are included with the SMK-1.

### WARRANTY (Limited)

Electro-Voice Speakers and Speaker Systems (excluding active electronics) 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 extend to finish, appearance items, burned coils, or malfunction due to abuse or operation under other than specified conditions, including cone and/or coil damage resulting from improperly designed enclosures, nor does it extend to incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee. A list of authorized warranty service agencies is available from Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107 (AC/616-695-6831); or Electro-Voice West, 8234 Doe Avenue, Visalia, CA 93291 (AC/209-651-7777). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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

Specifications subject to change without notice.