

## S1522ER

### Two-Way Stage Speaker System

- PRO™ circuit provides HF driver protection
- Integral stand mount
- Roadworthy enclosure with metal corners and grille, and heavy-duty handles
- Constant-directivity 90° X 40° die-cast horn
- High-excursion, EVG-15 15-inch woofer, specially designed for use in a trapezoidal enclosure

#### SPECIFICATIONS

**Axial Frequency Response** (swept sine wave, anechoic environment, 4 volts at 10 feet on axis, normalized for 1 watt, 1 meter into mid-bass driver; see Figure 1):

50-20,000 Hz

**Low-Frequency 3-dB-Down Point:**

55 Hz

**Usable Low-Frequency Limit (10-dB-down point):**

50 Hz

**Half-Space Reference Efficiency:**

4.1%

**Long-Term Average Power-Handling Capacity** (per ANS/EIA 426-A 1980; see Power-Handling Test section),

200 watts

**Maximum Woofer Acoustic Output:**

8.2 watts

**Sensitivity (SPL at 1 meter, 1 watt into nominal impedance, anechoic environment, band-limited pink-noise signal, 300-2,000 Hz):**

100 dB

**Beamwidth** (angle included by 6-dB-down points on polar responses, indicated one-third-octave bands of pink noise; see Figure 3),

250 to 20,000 Hz Horizontal:

110° (±60°)

5,000 to 20,000 Hz Vertical:

51° (±7°)

**Directivity Factor  $R_0(Q)$ , 800- to 16,000-Hz Median** (see Figure 4):

11.6 (+5.5, -8)

**Directivity Index  $D_0$ , 800- to 16,000-Hz Median** (see Figure 4):

10.5 dB (+1.5 dB, -5 dB)

**Distortion, 0.1 Full Power Input**

Second Harmonic,

100 Hz: 3%

1,000 Hz: 4%

10,000 Hz: 10%

Third Harmonic,

100 Hz: < 1%

1,000 Hz: < 1%

10,000 Hz: 5%

**Distortion, 0.01 Full Power Input,**

Second Harmonic,

100 Hz: 1%

1,000 Hz: 2%

10,000 Hz: 4%

Third Harmonic,

100 Hz: < 1%

1,000 Hz: < 1%

10,000 Hz: 1%

**Transducer Complement,**

High Frequency:

DH-2010A

HT94 constant-directivity horn

Low Frequency:

EVG-15

**Box Tuning Frequency:**

42 Hz

**Crossover Frequencies:**

1,600 Hz

**Crossover Slope:**

12 dB per octave

**Impedance,**

Nominal:

8 ohms

Minimum:

7.1 ohms

**Input Connections:**

Parallel 1/4-in. phone jacks

(allows paralleling of multiple speakers)

**Enclosure Materials and Color:**

Black carpet covered 3/4-in. Road-Wood™

**Grille:**

Perforated metal

**Dimensions,**

Height:

810 mm (31.9 in.)

Width:

627 mm (24.7 in.)

Depth:

394 mm (15.5 in.)

**Net Weight:**

28.2 kg (62 lb)

**Shipping Weight:**

31.4 kg (69.2 lb)

#### DESCRIPTION

The Electro-Voice S1522ER is a 200-watt, two-way, high-efficiency, constant-directivity stage system featuring a vented, direct-radiating woofer section. It combines professional-quality components arranged in a vertical array with an unusually durable trapezoidal enclosure. The result is wide-range, accurate sound reproduction with transparent highs and extended 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 then covered with densely-woven, abuse-resistant black carpeting. (U.S. Patent #4,624,338)

The high-frequency section of the S1522ER utilizes a 90° x 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 S1522ER is designed using Thiele-Small parameters for efficient performance to below 60 Hz. The new EVG-15, 15-inch woofer used is specially designed, featuring an extended-length voice coil and high-temperature construction materials.

S1522ER SPECIFICATION GRAPHICS

FIGURE 1 — Axial Frequency Response  
(anechoic environment, 1 watt/1 meter)

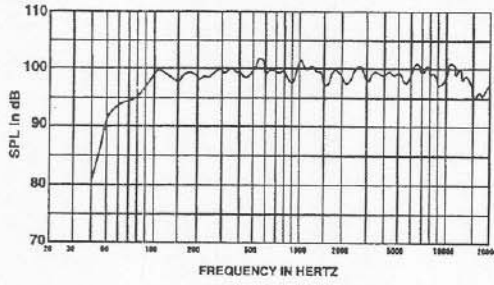


FIGURE 3 — Beamwidth vs Frequency  
(whole-space anechoic environment)

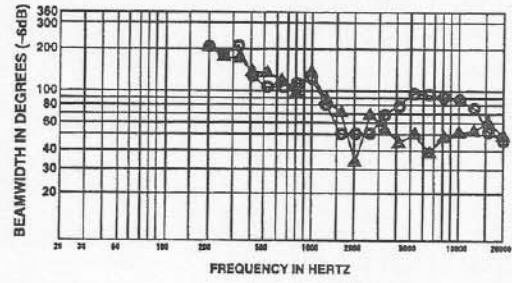
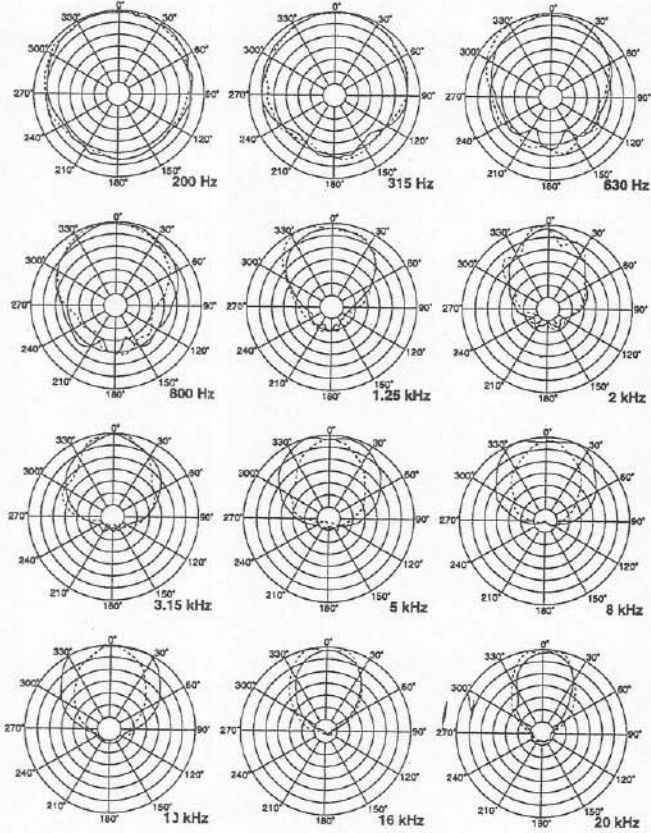


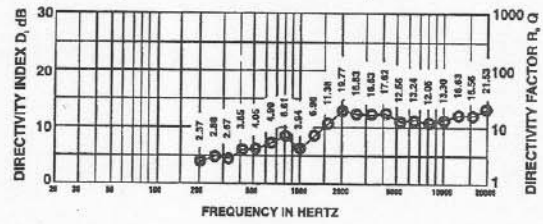
FIGURE 2 — One-Third-Octave Polar Responses  
(anechoic environment)



5 dB PER DIVISION

HORIZONTAL ———  
VERTICAL - - - - -

FIGURE 4 — Directivity vs Frequency  
(whole-space anechoic environment)



## 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 S1522ER 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, recessed handles and a protective metal grille complete the system and ensure that the S1522ER 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. Curves are shown for normal box tuning. This response was measured at 10 feet, using a swept-octave input of 4-volts; no external equalization was used.

## DIRECTIVITY

A unique feature of the S1522ER 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.  $P_0$  (Q) and

directivity index (D) 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 extremely 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 programs. 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 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 measure of reliability.

Specifically, the S1522ER 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 (1/3 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 modes.

## STAND MOUNTING

The S1522ER can be mounted on the 100BK speaker stand or any other stand with a 1 3/8-inch diameter shaft.

## UNIFORM LIMITED WARRANTY

Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction

resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice at 600 Cecil Street, Buchanan, MI 49107 (616/695-6831 or 800/234-6831). **Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Electro-Voice shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**Electro-Voice Speakers and Speaker Systems** are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Electro-Voice active electronics associated with the speaker systems are guaranteed for three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (616/695-6831 or 800/234-6831).

Specifications subject to change without notice.

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