

**Electro-Voice®**

a MARK IV company

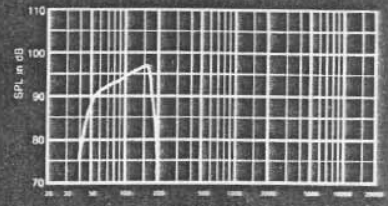


FIGURE 1 — Axial Amplitude Response  
(4 volts/10 feet)

# Model SH-1810L-ER Subwoofer

## SPECIFICATIONS

Frequency Response, 10 Feet on Axis, Swept 1/3-Octave, Half-Space Anechoic Environment (see Figure 1):  
46-250 Hz

Low-Frequency 3-dB-Down Point:  
46 Hz

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

Half-Space Reference Efficiency:  
6.2%

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

Maximum Woofer Acoustic Output:  
25 watts

Sound Pressure Level at 1 Meter, 1 Watt Input, Anechoic Environment, Band-Limited Pink Noise Signal, 50 to 200 Hz:  
100 dB

Dispersion Angle Included by 6-dB-Down Points on Polar Responses:  
Essentially omnidirectional

Distortion, 0.1 Full Power Input,  
Second Harmonic,  
100 Hz: 1%  
Third Harmonic,  
100 Hz: 0.6%

Distortion, 0.01 Full Power Input,  
Second Harmonic,  
100 Hz: 0.5%  
Third Harmonic,  
100 Hz: 0.5%

Transducer Complement:  
EVM-18B Pro-Line

## Recommended Crossover Frequency:

250 Hz

## 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 3/4-in. void-free plywood  
Perforated metal grille

## Enclosure Dimensions,

Height: 83 cm (32.8 in.)

Width: 63 cm (24.8 in.)

Depth: 61 cm (24.0 in.)

## Shipping Dimensions,

Height: 86 cm (34.0 in.)

Width: 65 cm (25.8 in.)

Depth: 65 cm (25.8 in.)

## Net Weight:

49 kg (109 lb)

## Shipping Weight:

54 kg (119 lb)

## DESCRIPTION

The Electro-Voice SH-1810L-ER is a 400-watt subwoofer loudspeaker system which combines the attributes of both horn-loaded and vented-box designs. It utilizes the unique SubScoop™ cabinet construction with a newly revised reverse geometry version of the EVM-18B Pro-Line woofer. It develops and extends the principles of the original SH-1800 with lessons learned from the MT-4 Manifold Technology® concert system. The

design behaves like a horn over much of its range, but without the time delay and weight problems usually associated with conventional designs. Vented-box principles take over for the lowest octave and assist in producing exceptionally high levels of clean, punchy bass from a sub-compact box. The reverse woofer geometry has been used to optimize the rear chamber volume and decrease the horn flare rate for extended low-end performance.

The SH-1810L-ER has numerous uses. It may be matched with the SH-1810H-ER mid/high module to create a high-output, full-range system. The SH-1810L-ER can also be used to augment the bass performance of any of the Electro-Voice Stage Systems. This may involve the use of appropriate electronics and crossovers.

## MULTIPLE USE

SH-1810L-ERs may be used in multiples to increase acoustic output. A 6-dB increase in maximum acoustic output occurs when two speaker systems are placed side by side and paralleled, yielding a 4-ohm load. For operation at very-low-frequencies, the woofer cones "mutually couple," acting as one system with twice the effective cone area and power-handling capacity of a single system. Efficiency is doubled by the increased cone area to provide 3 dB more output, while the doubled power capacity provides the potential for an additional 3-dB gain in maximum acoustic output.

Mutual coupling occurs when the center-to-center distance between woofer is less than one-half the wavelength. When the woofers are spaced greater than one-half the wavelength, the level increase is limited to the 3-dB input power increase. The woofer is connected using one of the 1/4-inch phone jacks marked "input." A parallel woofer can be connected using the other jack. Care must be taken not to abuse the amplifier by connecting impedances which are too low (see amplifier specifications).

#### CROSSOVERS AND AMPLIFIERS

To optimize performance, the SH-1810L-ER should be used in conjunction with an active crossover with a minimum slope of 12-dB-per-octave and a crossover frequency in the range of 100 to 250 Hz. When used with an SH-1810H-ER system a frequency of 250 Hz should be selected to complement and match the low-end performance of the SH-1810H-ER. Due to the high efficiency of the SH-1810L-ER, less amplifier input is needed to achieve a given sound output level. The high power-handling capability of the SH-1810L-ER permits the use of amplifiers with a rating of up to 800 watts rms into 8 ohms.

#### SPEAKER PROTECTION

When in the vented-box mode, the SubScoop™ like all other vented systems, experiences rapidly increasing cone excursion below the box-tuning frequency. The acoustic output is also decreasing rapidly, therefore it is sensible to protect the SH-1810L-ER and maximize the power output of the subwoofer by inserting an active 32 Hz high-pass filter with a slope of at least 12-dB-per-octave into the circuit. Such subpass-band filters are found in many commercially available crossovers and equalizers including items manufactured by Electro-Voice.

#### FREQUENCY RESPONSE

The SH-1810L-ER frequency response was measured at ten feet, using four-volt input in the EV large anechoic chamber, and was measured using a swept 1/3-octave pink noise signal. No external equalization was used.

#### ENCLOSURE CONSTRUCTION

Intended to be used as a portable speaker system, the SH-1810L-ER is ruggedly constructed of 3/4-inch void-free plywood. All joints are dado cut and the cabinet is finished with a densely-woven, abuse-resistant carpet that is both attractive and highly durable. A full-length steel grille protects the woofer from damage. Large heavy-duty metal corner protectors, firmly secured rubber feet, and recessed handles complete the picture and ensure that the SH-1810L-ER speaker system is ideally suited for a long and reliable life on the road.

#### POWER HANDLING CAPACITY

To our knowledge, Electro-Voice was the first U.S. manufacturer to develop and publish a power test related to real-life conditions. First, a random noise input signal is used because it contains many frequencies simultaneously, just like the real voice or instrument program. Second, our signal contains more energy at extremely high and low frequencies than the typical 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-term peaks which are many times higher than the average, just like the 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-1810L-ER is designed to withstand the power test described in the 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 set at 400 watts into 6.9 ohms EIA equivalent impedance, (52.4 volts true rms). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 1,200 watts peak (105 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

#### 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); and/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, MI 49107.

Specification subject to change without notice.



**ELECTRO-VOICE, INC., 600 Cecil Street, Buchanan, Michigan 49107**

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