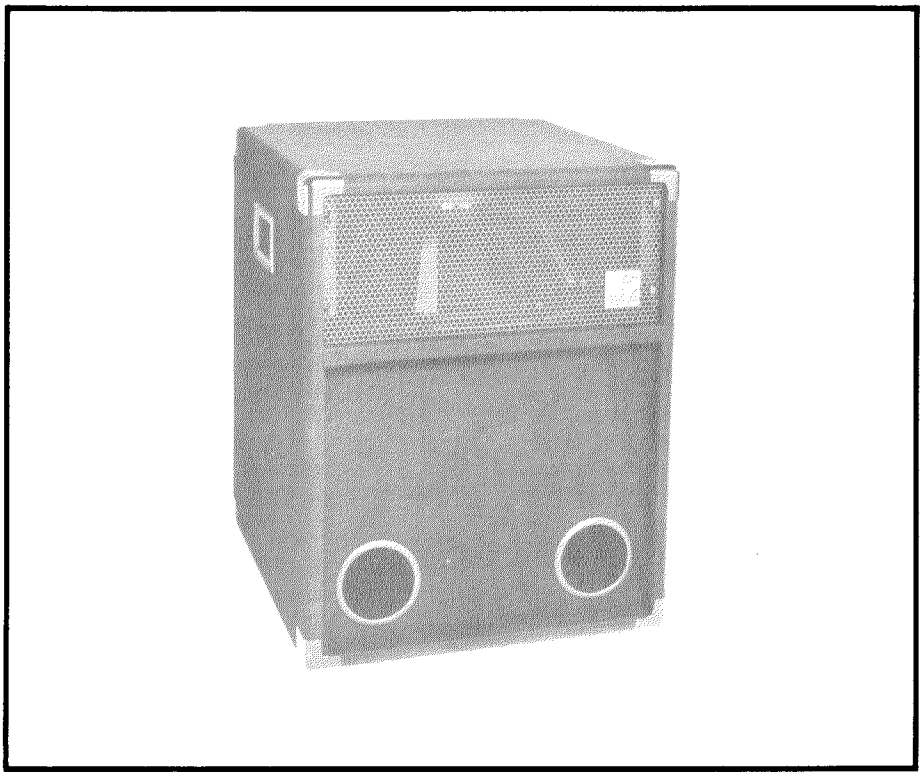

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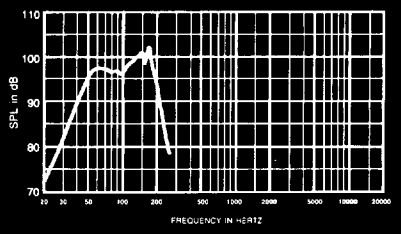


**FIGURE 1 — Axial Amplitude Response (1 watt/1 meter)**

# S-181
## Subwoofer

**SPECIFICATIONS**

**Frequency Response, Measured At 10 Feet on Axis, Swept 1/3-Octave, Half-Space Anechoic Environment (see Figure 1. Curve shown has been normalized for 1 Watt/1 Meter.):**
48-200 Hz

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

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

**Half-Space Reference Efficiency:**
3.8%

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

**Maximum Woofer Acoustic Output:**
16 watts

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

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

**Distortion, 0.1 Full Power Input,**
**Second Harmonic,**
**100 Hz:** 1.0%
**Third Harmonic,**
**100 Hz:** 1.0%

**Distortion, 0.01 Full Power Input,**
**Second Harmonic,**
**100 Hz:** <1.0%
**Third Harmonic,**
**100 Hz:** <1.0%

**Transducer Complement:**
DL18mt

**Recommended Crossover Frequency:**
200 Hz

**Impedance,**
**Nominal:**
8 ohms
**Minimum:**
8.0 ohms

**Input Connections:**
Parallel 1/4-in. phone jacks (allows paralleling of multiple speakers)

**Enclosure Materials and Colors:**
Black carpet covered 3/4-in. Roadwood™
Perforated metal grille

**Enclosure Dimensions,**
**Height:** 70.4 cm (27.7 in.)
**Width:** 53.8 cm (21.2 in.)
**Depth:** 58.1 cm (22.9 in.)

**Shipping Dimensions,**
**Height:** 71.1 cm (28.0 in.)
**Width:** 56.9 cm (22.4 in.)
**Depth:** 59.7 cm (23.5 in.)

**Net Weight:**
35.4 kg (78 lb)

**Shipping Weight:**
38.6 kg (85 lb)

**DESCRIPTION**

The Electro-Voice S-181 is a compact subwoofer designed for sound reinforcement. The single DL18mt 18-inch woofer is loaded into an enclosure based upon manifold principles, yielding efficient performance in the 50 Hz to 200 Hz frequency range. The design creates a bandpass for the subwoofer's output, providing a natural rolloff of 24 dB per octave at 200 Hz.

The 3-dB-down point of the S-181 subwoofer is 48 Hz, and usable response (-10 dB) is 36 Hz. The enclosure venting provides control of the woofer's excursion at the lowest frequencies of the subwoofer's output. Excursion is minimized at 43 Hz, with the majority of the output coming from the vents. For most efficient operation and protection from subsonic frequencies, a high pass filter at 32 Hz is recommended.

The DL18mt woofer used in the S-181 is identical to that used in the MTL-4 and MTL-2 Manifold Technology (U.S. Patent No. 4,733,749) low-frequency speaker systems, widely used in concert sound reinforcement. The woofer was designed specifically for manifolding. The high-power, high-excursion drive of the DL18mt is augmented by two exclusive Electro-Voice features, the Thermo Inductive Ring, TIR™, and PROTEF™ coating (U.S. Patent No. 4,547,632). The TIR acts as a control drive inductance and, more importantly, provides a major heat-transfer path from the top of the drive coil, reducing thermal dynamic-range compression. PROTEF™ is a Teflon®-based coating applied to the inside diameter of the top plate to physically protect the voice coil from rubbing during violent power peaks. The magnetic structure is specially designed to both concentrate magnetic flux in the gap and draw excess heat from the coil. Power handling is 400 watts long-term and 1,600 watts peak, per EIA Standard RS-426A.

**MULTIPLE USE**

The S-181 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 S-181 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 200 Hz. The high power-handling capability of the S-181 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 S-181, 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 S-181 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 S-181 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 S-181 is ruggedly constructed of 3/4-inch Roadwood™ (U.S. Patent No. 4,624,338). 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 steel grille protects the woofer from damage. Large metal heavy-duty corner protectors, firmly secured rubber feet, and recessed handles complete the picture and ensure that the S-181 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 S-181 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 9.2 ohms EIA equivalent impedance, (60.7 volts true rms). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 1,200 watts peak (121.4 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure models.

**WARRANTY (Limited) —**
Electro-Voice Speakers and Speaker Systems (excluding active electronics) are guaranteed for five years form 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.

Specifications subject to change without notice.

**ELECTRO-VOICE, INC., 600 Cecil Street, Buchanan, Michigan 49107**
MANUFACTURING PLANTS AT ■ BUCHANAN, MI ■ NEWPORT, TN ■ SEVIERVILLE, TN ■ OKLAHOMA CITY, OK ■ GANANOQUE, ONT.

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