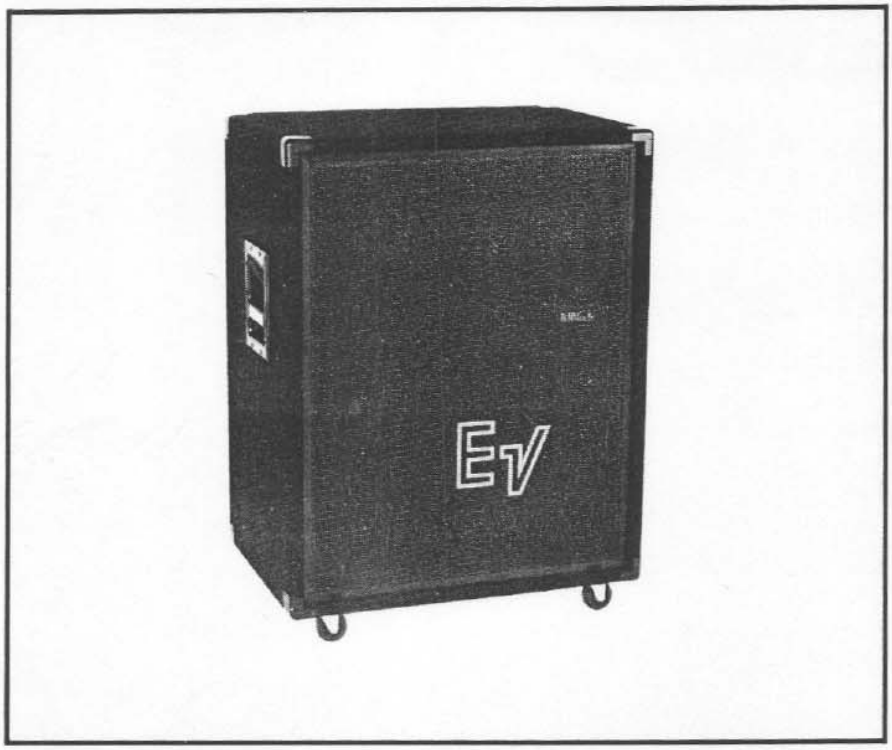

Electro-Voice®
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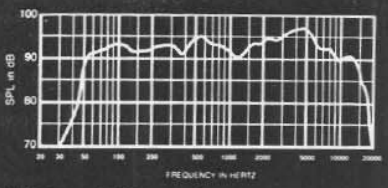

FIGURE 1 — Axial Frequency Response 4 Volts/10 Feet

Model S-1803
Stage Keyboard System

SPECIFICATIONS

Frequency Response, 10 Feet on Axis, Swept ⅓-Octave, Half-Space Anechoic Environment (see Figure 1):
50-16,000 Hz

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

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

Half-Space Reference Efficiency:
5.4%

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

Maximum Woofer Acoustic Output:
11 watts

Sound Pressure Level at 1 Meter, 1 Watt Input, Anechoic Environment, Band-Limited Pink Noise Signal, 300 to 2,000 Hz:
99.5 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):
118° ±70°
5,000-20,000 Hz Vertical (see Figure 3):
71° ±25°

Directivity Factor R_θ (Q), 800-16,000 Hz Median (see Figure 4):
9 (+6, −6)

Directivity Index D_I, 800-16,000 Hz Median (see Figure 4):
9.5 dB (+2.5 dB, −5 dB)

Distortion, 0.1 Full Power Input
Second Harmonic,
100 Hz:1.5%
1,000 Hz: 1%
10,000 Hz: 3%
Third Harmonic,
100 Hz: <1%
1,000 Hz: 2%
10,000 Hz: 3.5%

Distortion, 0.01 Full Power Input
Second Harmonic,
100 Hz: <1%
1,000 Hz: 1%
10,000 Hz: 1.5%
Third Harmonic,
100 Hz: <0.5%
1,000 Hz: 2%
10,000 Hz: <1.0%

Transducer Complement,
High-Frequency:
ST350B
Mid-Frequency:
Vented midrange
Low-Frequency:
EVX-18

Box Tuning Frequency:
37 Hz

Crossover Frequency:
600 Hz and 4,000 Hz

Crossover Slope:
12 dB per octave

Impedance,
Nominal:
8 ohms
Minimum:
4.9 ohms

Input Connections:
Parallel ¼-in. phone jacks (allows paralleling of multiple speakers)

Enclosure Materials and Colors:
Black carpet covered Road-Wood™

Dimensions:
90.2 cm (35.5 in.) high
49.2 cm (19.4 in.) deep
71.1 cm (28.0 in.) wide

Net Weight:
60.9 kg (134 lb)

Shipping Weight:
65.5 kg (144 lb)

DESCRIPTION

The Electro-Voice S-1803 is a 200-watt three-way, high-efficiency keyboard system. It combines professional quality components, highlighted by the VMR® vented midrange speaker, with an unusually durable Thiele-Small aligned vented enclosure. A high-frequency control and bi-amping provisions are featured. The result is clear and articulate high quality sound.

The enclosure is constructed of Road-Wood™, a structural material made of layered and selectively oriented hardwood strands. The covering is abuse-resistant black carpeting.

The high-frequency section of the S-1803 employs the ST350B constant-directivity tweeter featuring wide and unform high-frequency coverage coupled with an auto-limiting protection circuit.

The midrange is the EV VMR built with a high-efficiency flat wire coil and high temperature construction materials.

The bass section of the S-1803 is designed using Thiele-Small parameters for efficient, performance to below 50 Hz. The woofer is an EVX-18 unit featuring beryllium copper lead wires and an extended length, edge-

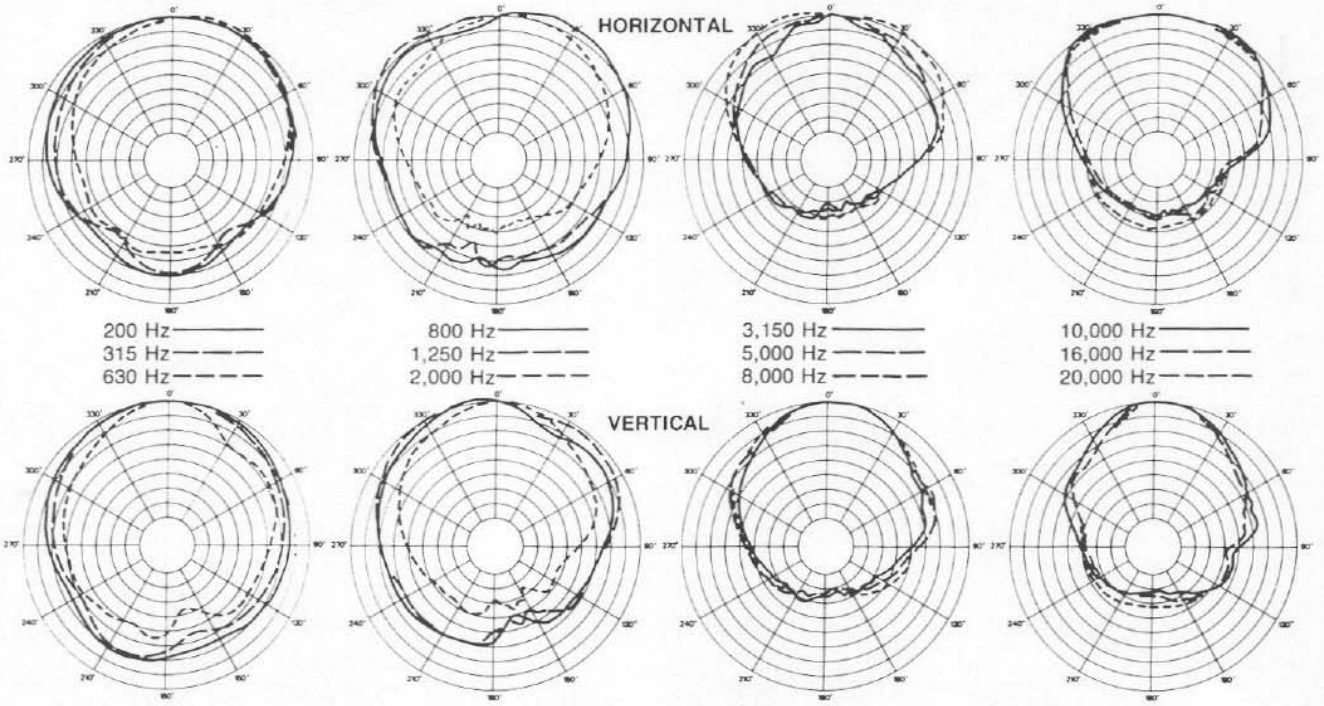

FIGURE 2 — Polar Response (⅓-octave pink noise 4 volts/10 feet)

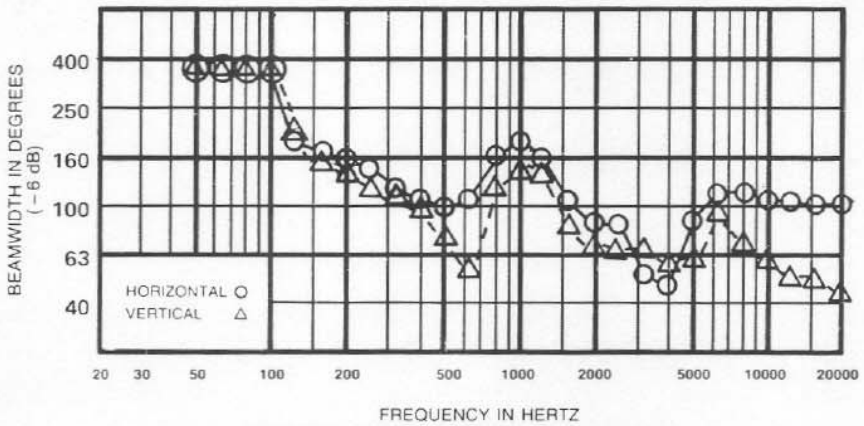

FIGURE 3 — Beamwidth vs Frequency Whole Space (anechoic)

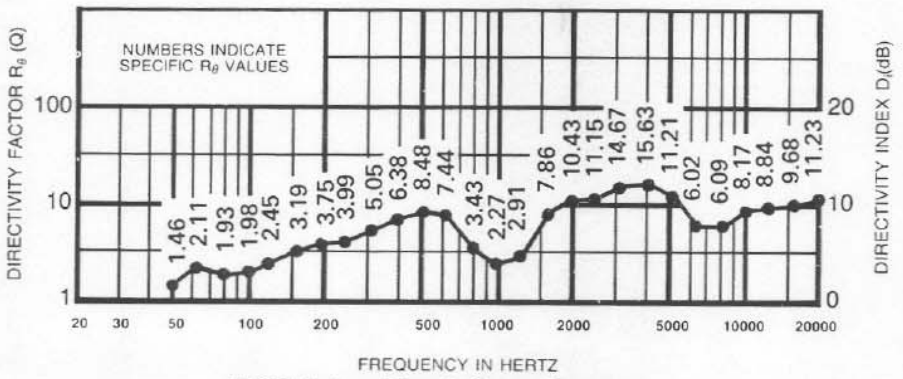

FIGURE 4 — Directivity vs Frequency Whole Space (anechoic)

wound voice coil protected by the unique EV Thermo Inductive Ring (TIR™). The part of the magnet structure adjacent to the coil is insulated, using the exclusive EV PROTEF™ process. The coil is driven by a massive (16 lb) magnetic structure.

THE VENTED MIDRANGE

An unusual feature of this system is the vented midrange used to bridge the frequency region between the specialized EVX woofer and the ST350B tweeter. This EV innovation represents a unique way of providing high acoustic output and efficiency from a compact direct-radiator form of loudspeaker. It is capable of providing large amounts of acoustic output from a small package that can be gracefully integrated into a medium size loudspeaker system. It does so without having the "honky" sound quality and upper range beaminess sometimes associated with small format horn transducers used to cover midrange frequencies with bandpass beginning below 1000 Hz. It contributes to providing natural high quality sound in a musical instrument loudspeaker system.

ENCLOSURE CONSTRUCTION

The S-1803 enclosure utilizes a structural material that combines the strength of high-quality plywood with the density and acoustic damping of particle board without the 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 hard-wood. 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 S-1803 speaker system is ideally suited to a long and reliable life "on the road."

FREQUENCY RESPONSE

The combination of a 18-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. The response was measured using swept ⅓ octave. No external equalization was used.

DISPERSION

The polar frequency response curves for the S-1803 are given in Figure 2. The data was taken using octave bands of random (pink) noise. With the speaker system's long axis vertical, both the horizontal (side-to-side) and vertical (up and down) polar responses are shown. The measuring microphone was ten feet from the speaker system. From this data, the 6-dB-down points were obtained and beamwidth-versus-frequency plots were made. This information is shown in Figure 3.

HIGH FREQUENCY ATTENUATION CONTROL

The High Frequency control is mounted on the front of the system for the convenience of the performer when used as a keyboard system. This control attenuates the level of the vented midrange and tweeter in three steps, from 600 Hz up. The 0 dB position leaves the high-frequency components at full output. The next two positions attenuate the high-frequency level in 3 dB steps and the last counterclockwise position drops the level 6 dB (12 dB from full on).

HI-FREQUENCY AUTO LIMITING

This is an all solid state electronic device designed by Electro-Voice engineers to meet the special demands of high level sound reinforcement. The Hi-Frequency Auto Limiter efficiently protects the tweeter from overloading by limiting tweeter power input to a predetermined safe level. The result is virtual absolute driver protection without audible side effects or loss of sound pressure level. This all solid state device responds instantaneously and is not dependent on slow moving mechnical parts. Hi-frequency auto limiting incorporates two solid state devices and a power resistor with appropriate heat sink.

BI-AMPING

The S-1803 may easily be converted for bi-amp operation. On the rear connector panel thre are two 9-pin plugs and sockets with exposed jumper wires. For normal operation the 4-wire jumper is to the left. Reversing the plugs puts the S-1803 in the bi-amp mode with the low-frequency input located at the left input phone jack and the high-frequency input at the right input phone jack. In normal operation the two input jacks are wired in parallel for a standard in-out configuration. The crossover frequency for bi-amp operation should be between 600 and 800 Hz with either a second-order Butterworth (12-dB-per-octave slopes) or third-order Butterworth (18-dB-per-octave slopes) response characteristic. For flattest response in the crossover region when a second-order crossover is used, the polarity between the woofer and high-frequency sections should be the same, i.e., the positive output terminal of the low-frequency amplifier should go to the positive woofer input (phone plug tip) on the S-1803 and the positive ouptut terminal of the high-frequency amplifier should go to the positive high-frequency input (phone plug tip) on the S-1803. This instruction assumes, of course, that there is no polarity shift between the high- and low-frequency amplifier channels. ***When a third-order crossover is used, the polarity between the woofer and high-frequency sections should be reversed.***

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 inter-pret 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 excusion). 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-1803 is designed to withstand the power test described in the revised 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 1200 Hz with a 3-dB-per-octave slope above 1200 Hz. This shaped signal is sent to the power amplifier with the continuous power set at 200 watts into the 7.7 ohms EIA equivalent impedance, (39.2 volts true RMS). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 800 watts peak (78.4 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

GRILLE REMOVAL

The grille assembly of the S-1803 is fastened to the enclosure using six sturdy dual-lock fasteners. The grille assembly can be removed quickly and easily, allowing access to the drivers, by firmly pulling on the two black polyester ribbon loops provided.