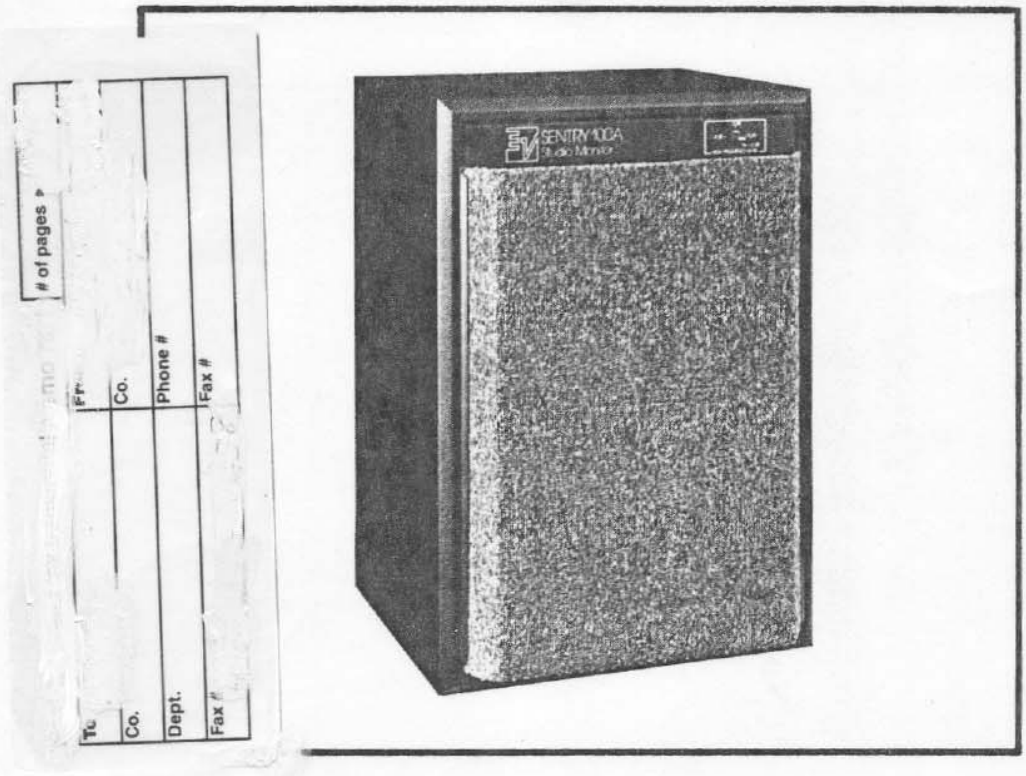

Electro-Voice®
a gulton company

Sentry® 100A Professional Monitor System

SPECIFICATIONS

Frequency Response, 1 Meter on Axis, Anechoic Environment, Swept One-Third-Octave Pink Noise ± 3 dB:
45 to 18,000 Hz

Half-Space Reference Efficiency:
.6%

Dispersion Angle Included by 6-dB-Down Points,
10 Foot Microphone Distance
Anechoic Environment,
One-Third-Octave Bands of Pink Noise,

Horizontal:
250–6,300 Hz
158° ± 32°
8,000–20,000 Hz
55° ± 18°

Vertical:
250–6,300 Hz
140° ± 40°
8,000–20,000 Hz
52° ± 13°

Maximum Midband Acoustic Output Power:
0.18 watt

Crossover Frequency:
2 kHz

Sound Pressure Level at 1 Meter, 1 Watt into Nominal Impedance, Anechoic Environment, 300–2,000 Hz Average:
91 dB

EIA Sensitivity Rating (on axis measurement):
41.8 dB

Long-Term Average Power-Handling Capacity (above 40 Hz):
30 watts

Short-Term Power Handling Capacity (10 Milliseconds) (above 40 Hz):
300 watts

Nominal Impedance:
6 ohms

Minimum Impedance:
4.5 ohms

Optional Accessory:
SRB-7 rack-mount/wall-mount brackets

Dimensions:
43.8 cm (17.25 in.) high
30.5 cm (12.00 in.) wide
28.2 cm (11.125 in.) deep

Net Weight:
12.7 kg (28 lb)

DESCRIPTION

The Electro-Voice Sentry® 100A monitor speaker system is the direct result of "human engineering" with the broadcast/recording studio engineer in mind. Our product engineers' no-nonsense design efforts have culminated in a system that speaks to the needs of professionals with specific requirements: high efficiency with extended low-frequency response, high power capacity across the entire frequency range, uniform frequency response and dispersion, all in a compact, no-frills package.

The Sentry 100A employs a Super-Dome™ tweeter capable of handling 25 watts of input power (most tweeters operate in the 5 watt range), while faithfully reproducing the program material with response out to 18 kHz and uniform dispersion (120° at 5 kHz). No longer will accidental high-frequency blasts from tape head contact in rewind/fast-forward mode result in a curl of smoke where a tweeter used to be. The low-frequency section is an 8" direct radiator woofer installed in an optimally vented enclosure with fourth-order Butterworth tuning.[1] The optimally vented design is responsible for the unusual combination of small size, extended bass response, and high efficiency. Such performance is simply not available in other enclosures of similar size.

The Sentry 100A is housed in a utility cabinet wrapped in a special, scratch-resistant, matte black vinyl. The cabinet

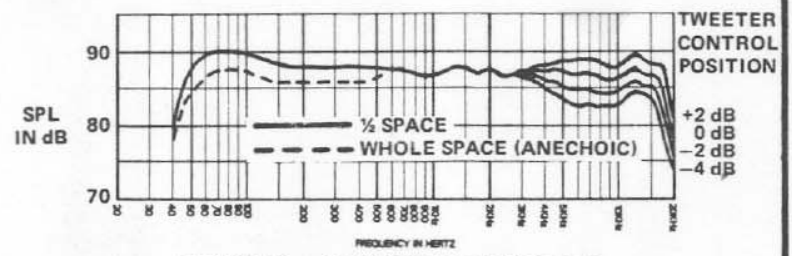

FIGURE 1 – Axial Frequency Response
2 Volts/3 Feet

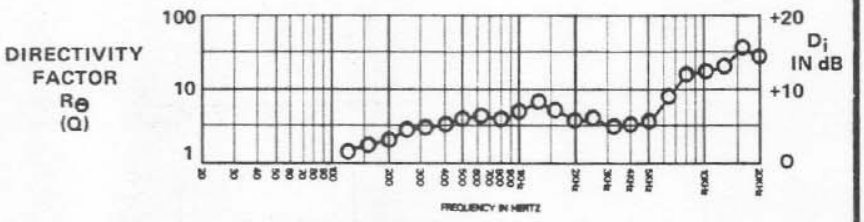

FIGURE 2– Directivity vs Frequency

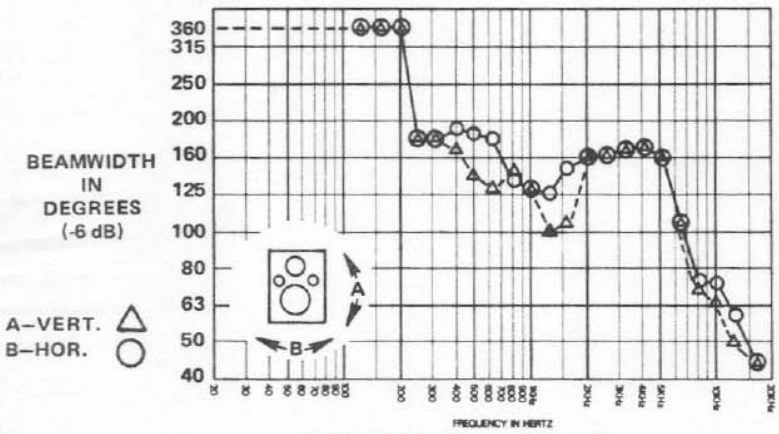

FIGURE 3– Beamwidth vs Frequency

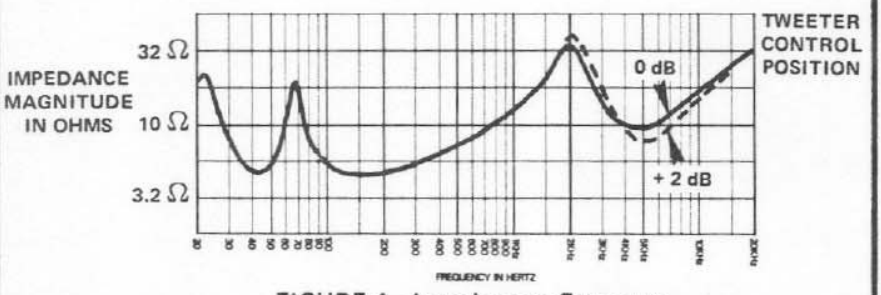

FIGURE 4– Impedance vs Frequency

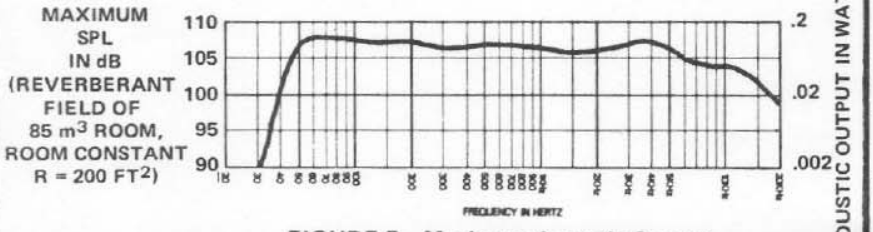

FIGURE 5– Maximum Acoustic Output

size is intentionally designed for rack mounting. When coupled with the SRB-7 rack-mount/wall-mount kit, the Sentry 100A can be integrated into virtually any environment that demands conservation of space such as mobile recording studio facilities. The steel-reinforced grille is covered with a custom gray cloth. This provides maximum protection, acoustic transparency, and pleasing esthetic quality.

LOUDSPEAKER RESPONSE DUE TO THE ACOUSTICAL ENVIRONMENT

Several factors must be considered when determining the overall response of a speaker system in any listening environment. Physical characteristics of the room itself, and placement of speakers and listener can have considerable affect on SPL capability, perceived and/or measured frequency response, and stereo imaging.

As pointed out in several texts on room acoustics, as the source-listener distance increases, the sound pressure level (SPL) decreases in the direct field at a steady rate (inverse square law: 6 dB drop for every doubling of distance) until a certain distance is reached. This point is often called the critical distance (D_C). Beyond this point, the SPL approaches a constant value (the reverberant field). The listening position in the sound field determines the amount of acoustic power output of the speaker system needed to produce a certain sound pressure level at the engineer's ears. Generally speaking, the amount of power output needed from the speaker/amplifier system decreases as the room becomes smaller and/or more reverberant (shorter critical distance). In most cases, the audio engineer will be working well within the direct field. If indeed this is the case, the amplifier power requirement is entirely dependent on the loss in SPL due to inverse square law.

The low-frequency response of the overall system can be adversely affected by poor placement of the monitor speakers themselves. The Sentry 100 was designed for 1/4- to 1/2- space use. This requires that the speaker system be mounted as close as possible to floor/ceiling and/or wall surfaces. Placement in loose cavities or resonant mountings can also seriously degrade the overall response.

SPEAKER PLACEMENT FOR GOOD STEREO IMAGING

Results of testing done by Electro-Voice and several others such as Juhani Borenious[2] suggest a recommended listening angle γ of 60° ± 10° for an

optimum stereo image. Rather than measure an imaginary angle, exact positioning can be attained by placing the speakers so that the ratio of distances h/b – 0.9 ± 0.2. (see Figure 6) The stereo image that results is further reinforced by the uniform dispersional characteristics of the Sentry 100A, particularly in the higher frequency range, where the majority of stereo information lies. Off-axis degradation of frequency response cannot be corrected by supplementary equalization. It is therefore critically necessary to use a speaker system with uniform directivity as well as smooth on-axis response.

POWER HANDLING CAPACITY

Power handling specifications are usually meaningless because they fail to indicate the nature of the test signal and/or how this test signal relates to actual use. The 30-watt specification for the Sentry 100A is based on filtered random noise (FM interstation noise and tape hiss are common forms of random noise), which is fed to the speaker for an extended time (more than 15 hours).

Random noise testing is used because, like real music and speech program material, it contains many frequencies at once. Low frequencies, which cause large excursions of the woofer suspension, are present as well as mid-bass frequencies which contribute mainly to woofer voice-coil heating. Thus the woofer is simultaneously tested for mechanical fatique and voice-coil overheating. Similarly, the tweeter is tested for both mechanical and thermal failure at appropriate power levels.

There is no generally accepted standard for testing loudspeakers for power capacity. At Electro-Voice, we expect each speaker and system to survive 15 hours continuous application of rated power without failure of any component or permanent change in performance.

One noise test standard, the West German D.I.N. 45573, specifies the random noise spectrum shown in Figure 7. This spectrum agrees approximately with studies of voice and music spectra that appear in several textbooks on acoustics [3,4]. However, only a very small percentage of the power applied to a Sentry 100A would be in the range of the tweeter using this spectrum.

A study done by John P. Overley of Electro-Voice [5] resulted in the more realistic spectrum of Figure 8.

The curve shows the relative levels in octave bands of average peak energy found in many musical passages of a symphony orchestra. "Based upon peaks as short as a fraction of a second in duration . . . it represents the approximate distribution of energy vs. frequency under highest signal conditions. . . . exactly those conditions which should determine the power handling requirements of audio components."[6] The musical passages were taken from disc recordings that were played back on "carefully equalized high quality transcription equipment."[7]

The test signal actually used in developmental testing of the Sentry 100A is shown in Figure 9. It is an approximation to measured spectra of the output of a lead guitar amplifier driven into heavy clipping, and represents a worst case situation. The Sentry 100A will survive 30 watts of this input for at least 15 hours.

The power handling specification applies to long-term application of power; for short duration peaks the loudspeaker system is capable of handling many times the rated power. For example: for a few milliseconds the system will handle 10 dB peaks. If the average input power level were 30 watts then it would handle peak power inputs on the order of 300 watts.

CROSSOVER NETWORK

The integral crossover network is a 12-dB/octave dual-section type, crossover occurring at 2 kHz. In addition, the Sentry 100A has a continuously variable, shelf-type high-frequency control which allows adjustment for individual listening preferences, with both boost and cut capability (+2 dB to -4 dB from nominally flat). The high-frequency control is conveniently located on the front panel for easy access.

SRB-7 RACK MOUNT KIT

One of the fundamental design requirements for the Sentry 100A provided for the ability to install the system in standard EIA 19" racks. The hardware needed for this procedure is available as an optional kit. This same kit provides for flush and angle wall mounting as well. (Refer to the SRB-7 engineering data sheet for complete details.)

A second nameplate, which can be applied over the original label, has been included for those situations where mounting the Sentry 100A in an inverted position is preferred (woofer nearer to ceiling).

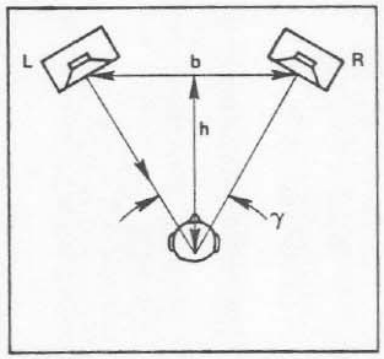

FIGURE 6 – Speaker/Listener Location for Good Stereo Imaging

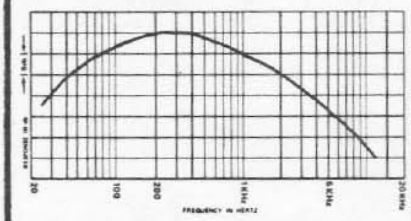

FIGURE 7 – Random Noise Spectrum Specified by D.I.N. 45573 for Power Testing of Loudspeakers (1/10 Octave Analyzer)

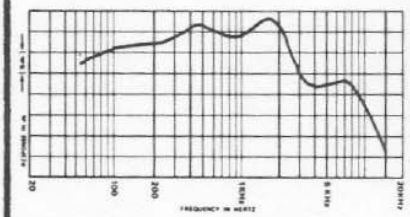

FIGURE 8 – Ensemble Average of Peak Energy Levels (Relative), Symphony Orchestra

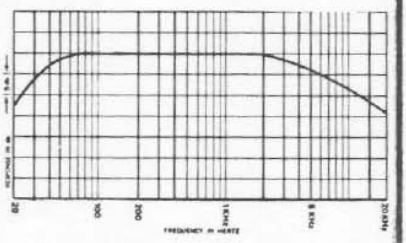

FIGURE 9 – Random Noise Spectrum for Testing Sentry 100A (1/10 Octave Analyzer)

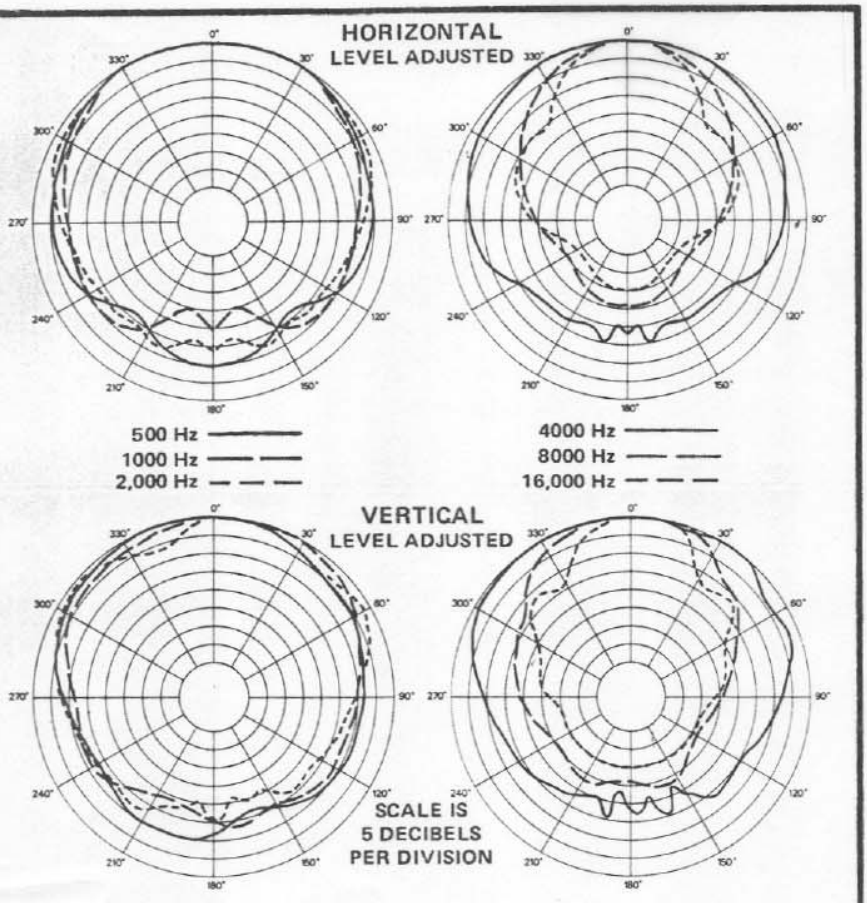

FIGURE 10 – Sentry 100A Polar Response (System Long Axis Vertical)

WARRANTY (Limited) –
Electro-Voice Sentry Loudspeakers and accessories 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 cover finish or appearance items or malfunction due to abuse or operation at other than specified conditions. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

For shipping address and instructions on return of Electro-Voice products for repair and locations of authorized service agencies, please write: Service Department, Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107 (Phone: 616/695-6831), or Electro-Voice West, 8234 Doe Avenue, P.O. Box 3297 Visalia, CA 93277 (Phone: 209/651-7777).

Electro-Voice also maintains complete facilities for non-warranty service.

Specifications subject to change without notice.

1. A. N. Thiele, "Loudspeakers in Vented Boxes: Part 1," J. AUDIO ENGINEERING SOCIETY, Vol. 19, No. 5, p.p. 386-387 (1971)
2. Juhani Borenius, "On Loudspeaker Response in Sound Control Rooms," J. Audio Engineering Society, Preprint (1980)
3. H. F. Olson, PhD., "Acoustical Engineering" (D. Van Nostrand Company, Inc., Princeton, New Jersey, p. 588, 1957)
4. L. Beranek, "Acoustics" (McGraw-Hill Book Company, New York, p. 338, 1954)
5. John P. Overley, "Energy Distribution in Music, "IRE Transactions on Audio, Vol. AU-4, No. 5, Sept.–Oct., (1956)
6. Ibid. Pg. 121
7. Ibid. Pg. 121

Part Number 530080 – 119

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