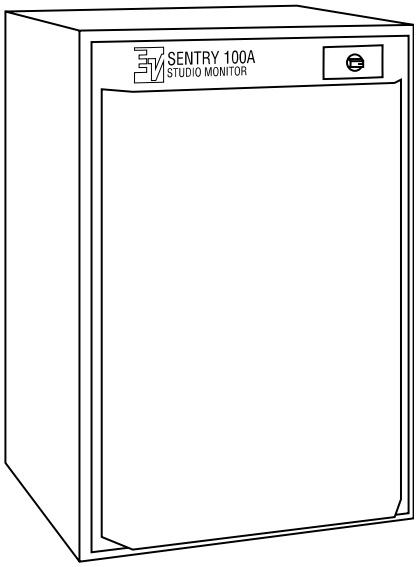
Electro-Voice®

Sentry® 100A

Professional Monitor System

- Near-field monitor for post production and live sound
- Wide, uniform coverage
- Extremely smooth frequency response
- High power handling



Descriptions

The Electro-Voice Sentry® 100A monitor speaker system is the direct result of "human engineering" with the broadcast/recording studio engineer in mind. This system has high efficiency, extended low-frequency range, and a uniform frequency response and dispersion, 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 18,000 Hz and uniform dispersion (120° at 5,000 Hz). Never again will accidental, high-frequency blasts from tape head contact (in rewind/fast-forward mode) leave a curl of smoke where a tweeter used to be. The low-frequency section is an 8 in. 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 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 a pleasing aesthetic 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, placement of speakers, and position of the listener.

As pointed out in several texts on room acoustics, as the source-listener distance increased, the sound pressure level (SPL) decreased 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 reverberation 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 100A 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.

1. A.N. Thiele, "Loudspeakers in Vented Boxes: Part 1," **J. Audio Engineering Society,** Vol. 19, No. 5, pp 386-387 (1971).

SpeakerPlacement For Good Stereo Imaging

Results of testing by Electro-Voice and others, such as Juhani Borenious[2], suggest a recommended listening angle ***y*** of 60° ±10° for an optimum stereo image. Rather than measure an imaginary angle, exact positioning can be obtained by placing the speakers so that the ratio of distances h/b = 0.9 ±0.2. The stereo image that results is further reinforced by the uniform dispersant 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; and mid bass frequencies, which contribute mainly to woofer voice-coil heating, are present as well. Thus the woofer is simultaneously tested for mechanical fatigue 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. 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.

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-cast 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 2,000 Hz. 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-7Rack Wall Mount Kit

One of the fundamental design requirements for the Sentry 100A provided for the ability to install the system in standard EIA 19 in. 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).

warning:

Never mount the Sentry 100A by the back panel or by only one of the other panels. Failing to comply with this will cause the panel to separate, resulting in the speaker falling. For the safest method of mounting the Sentry 100A, Electro-Voice strongly suggests using the Model SRB-7 rack/wall mounting kit.

2. Juhani Boreniou, "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 of Audio,** Vol. AU-4, No. 5, Sept.-Oct. (1956).
6. Ibid. p. 121.
7. Ibid. p. 121.

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 Service or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice Service 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 Service at 600 Cecil Street, Buchanan, MI 49107 (800/234-6831 or FAX 616/695-4743). **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.

For warranty repair or service information, contact the service repair department at: 616/695-6831 or 800/685-2606.

For technical assistance, contact Technical Support at 800/234-6831 or 616/695-6831, M-F, 8:00 a.m. to 5:00 p.m. Eastern Standard Time.

Specifications subject to change without notice.

FIGURE 1—Axial Frequency Response, 2 Volts/3 Feet

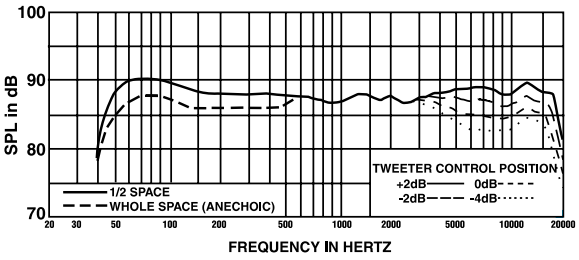


FIGURE 2—Dimensions

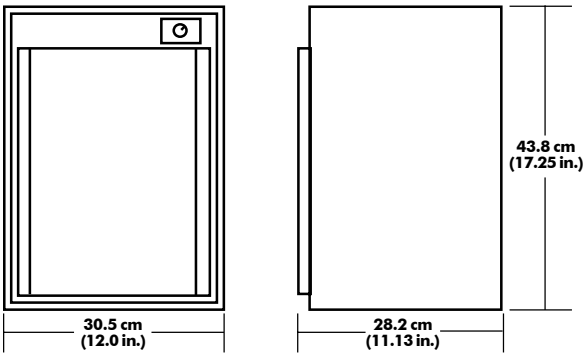


FIGURE 3—Directivity vs Frequency

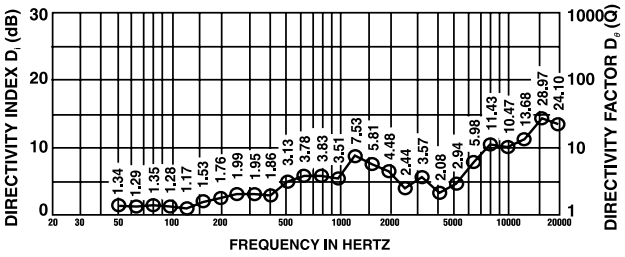


FIGURE 4—Beamwidth vs Frequency

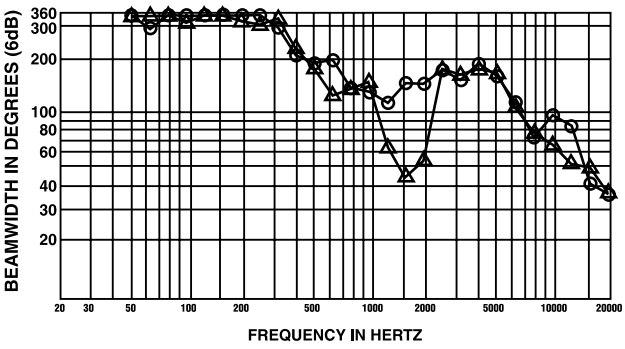


FIGURE 5—Impedance vs Frequency

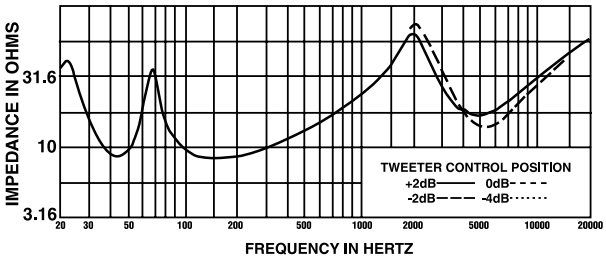
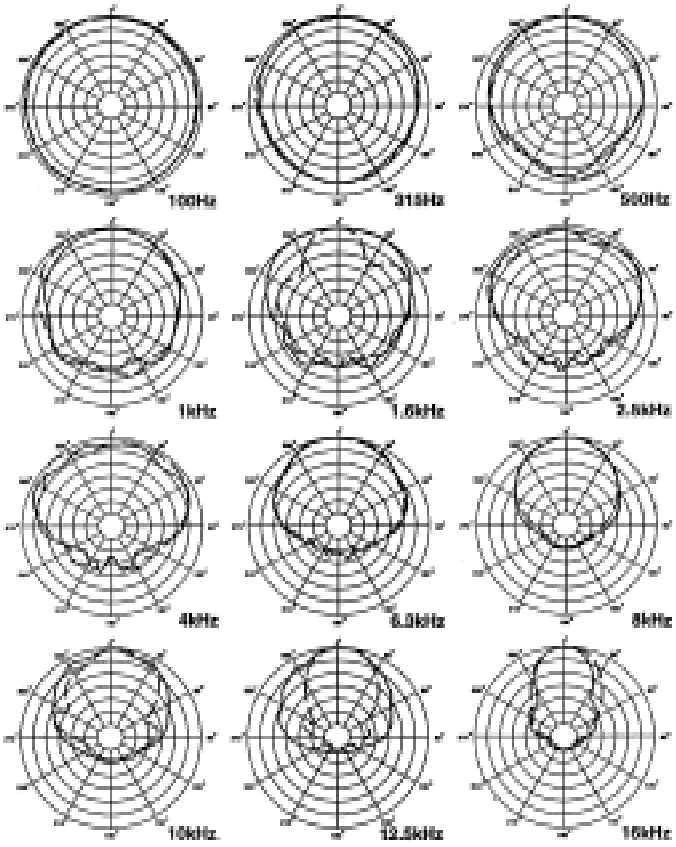


FIGURE 6—Polar Response



Sentry® 100A Professional Monitor System

Specifications

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

45-18,000 Hz

Half-Space Reference Efficiency:

0.6%

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:

2,000 Hz

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 (see Figure 2),

Height:

43.8 cm (17.25 in.)

Width:

30.5 cm (12.00 in.)

Depth:

28.2 cm (11.13 in.)

Net Weight:

12.7 kg (28 lb)

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Part Number 532077—9943