

**Electro-Voice®**  
a gulton company

## Model 100S Two-Way Constant-Directivity Speaker System

### SPECIFICATIONS

Frequency Response, 1 Meter on Axis,  
Swept One-Third-Octave Pink Noise:  
80-18,000 Hz,  $\pm 3$  dB

Usable Low-Frequency Limit  
(-10-dB-Down Point):  
50 Hz

Reference Efficiency  $\frac{1}{2}$  Space:  
2.3%

Impedance:  
8 ohms nominal  
6.5 ohms minimum

Maximum Midband Acoustic Output Power:  
1.0 watt

Sound Pressure Level, Anechoic Environ-  
ment, 300-2,000 Hz Random Noise:  
96 dB at 1 meter with 1 watt input

Long-Term Average Power-Handling  
Capacity at 8 ohms:  
100 watts 40-4,000 Hz

Short-Term (less than 10 milliseconds)  
Power Capacity at 8 Ohms:  
400 watts 40 Hz to 4,000 Hz

Crossover Frequency:  
1,500 Hz electrical

Crossover Slope:  
12 dB/octave

Dispersion Angle Included by 6-dB-Down  
Points,  $\frac{1}{3}$ -Octave Bands of Random Noise,  
250-500 Hz Horizontal & Vertical:  
150°  $\pm 30^\circ$

500-10,000 Hz Horizontal & Vertical:  
100°  $\pm 20^\circ$

10-20,000 Hz Horizontal & Vertical:  
60°  $\pm 12^\circ$

### Transducer Complement:

12 in. woofer  
1½ in. tweeter coupled to 9 in. director

### Control:

4-position, tweeter attenuation from flat to  
-9 dB in 3-dB steps

### Dimensions:

61 cm (24.0 in.) high  
38.1 cm (15.0 in.) wide  
21.6 cm (8.5 in.) deep

### Net Weight:

12.7 kg (28.0 lbs)

### Optional Accessories:

WB-100S wall mount kit  
VPC-100S protective vinyl cover  
100BK speaker stand

### DESCRIPTION

The Electro-Voice Entertainer® Model 100S was designed with the soloist or small group in mind. It is perfectly suited for applications from auditoriums to small lounges. The 100S speaker system was specifically intended for convenient portable use with outstanding sonic performance.

The 100S speaker system features a one-piece plastic cabinet (patent no. 276,518) utilizing specially developed molding techniques never before applied to speaker enclosures. This construction yields a wall thickness similar to wood cabinets, a rigid structure that is virtually indestructible and a finish that is impervious to nearly all chemicals. The small size (occupies less than

1.8 cu. ft.), lightweight (28 lbs) and convenient shape make it ideal for carrying, setup and storing. The cabinet also features molded-in inserts to allow vertical or horizontal mounting on the 100BK telescoping stand and a convenient recessed luggage-type handle for easy carrying.

The Model 100S employs a version of the Electro-Voice Super-Dome™ tweeter. This tweeter is a proven high-power design capable of handling 25 watts of input power (most tweeters operate in the 5-watt range). The small, environmentally resistant diaphragm and 1.6 lb magnetic structure produce high efficiency and extended high-end response. The Super-Dome™ tweeter is coupled to a high frequency "director" that is molded as an integral part of the cabinet. The unique coupling of a direct radiator to a directivity controlling device duplicates the performance of a constant-directivity horn with much of the efficiency advantage retained.

The low-frequency section is a durable 12-inch direct radiator woofer with a 10-pound magnet assembly for high efficiency. A special cone material used in the woofer is resistant to difficult environmental conditions such as heat and dampness. It is physically protected by a tough metal screen that can be removed and rotated for properly oriented graphics. The high excursion capability and long overhung coil provide low distortion in the vented enclosure. The vented design is

10,000 Hz. This special characteristic means uniform and dependable audience coverage without "hot spots" or dead zones at certain frequencies. By combining constant directivity and flat frequency response, the 100S system delivers flat power response and uniform sound coverage throughout the audience in the critical midrange (4 octaves). This is an important and extraordinary feature of the Entertainer® system, previously only available in high cost component or permanently installed systems.

#### 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 perceived and/or measured frequency response and output capability.

The listening position in the sound field determines the amount of acoustic power output required of the speaker system to produce a certain sound pressure level at the listener'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.

The frequency response of the overall system can be adversely affected by poor placement of the speakers themselves. For best results the speaker system should be mounted on speaker stands away from floor, ceiling, or wall surfaces.

#### POWER HANDLING

Power handling specifications are meaningful to the extent that the nature of the test signal relates to actual use. The 100-watt specification for the 100S 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. 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 fatigue and voice-coil overheating. Similarly, the tweeter is tested for both mechanical and thermal failure at appropriate power levels.

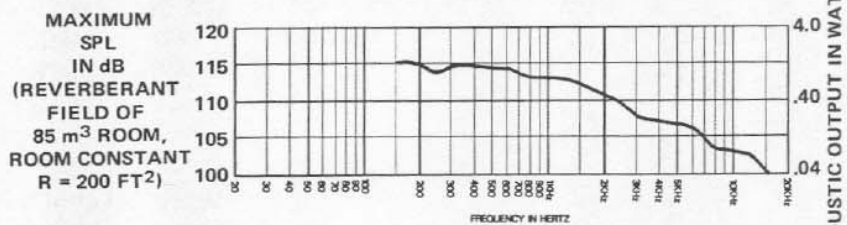


FIGURE 5 — Maximum Acoustic Output

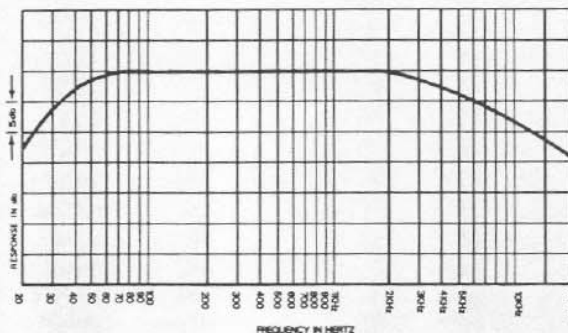


FIGURE 6 — Random Noise Spectrum for Testing 100S (1/10 Octave Analyzer)

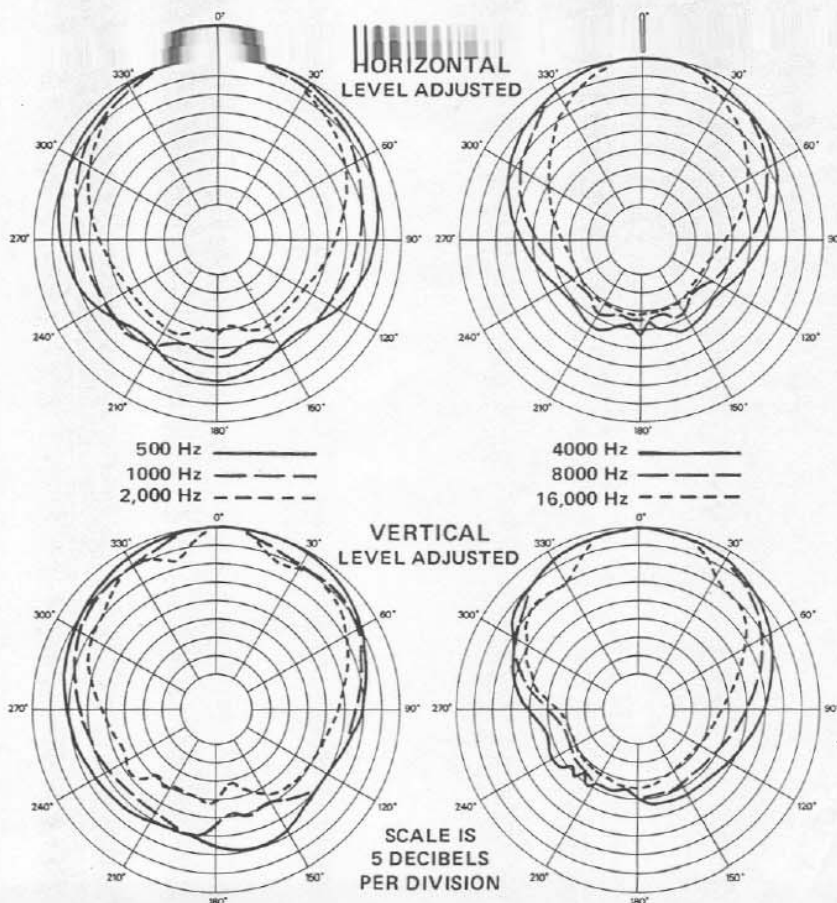


FIGURE 7 — 100S Polar Response (System Long Axis Vertical)

ACOUSTIC OUTPUT IN WATTS

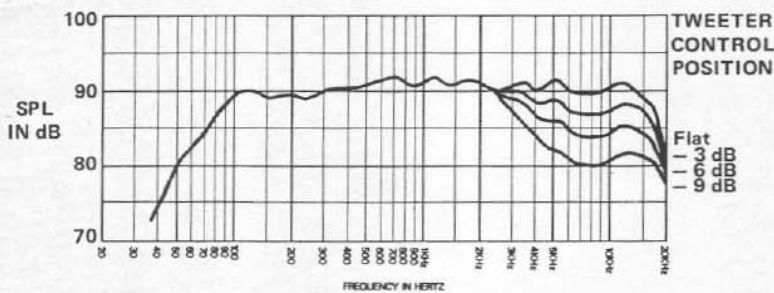


FIGURE 1 — Axial Frequency Response  
4 Volts/10 Feet

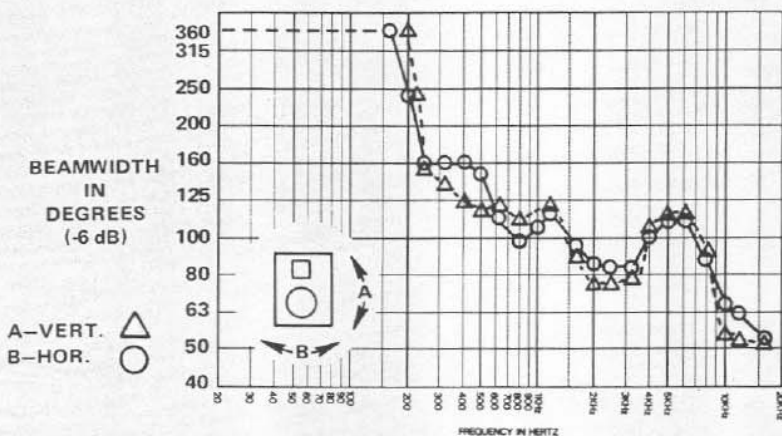


FIGURE 2 — Beamwidth vs Frequency

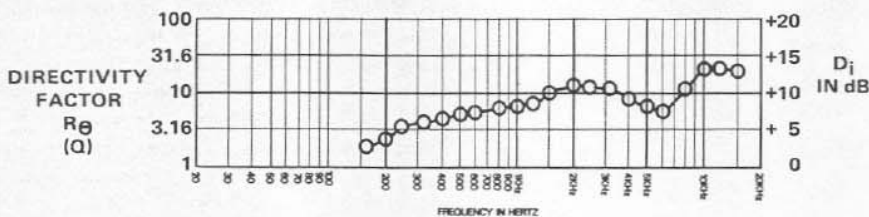


FIGURE 3 — Directivity vs Frequency

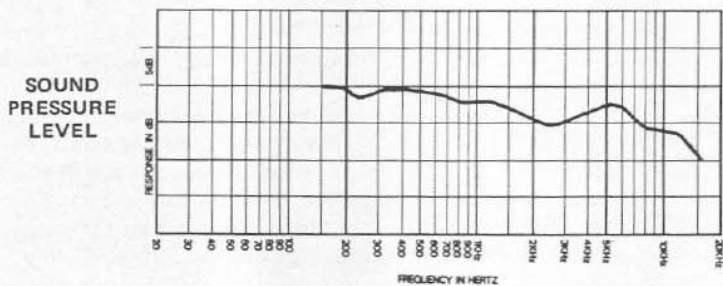


FIGURE 4 — Power Output vs Frequency

responsible for the unusual combination of small size, extended bass response and high efficiency. Also, the low distortion, high efficiency vented design combined with high power handling provides plenty of room-filling sound (96 dB SPL at 1 W/1m), which is phase coherent over the critical midband. Such performance is simply not available in other enclosures of similar size.

The integral crossover network is a 12-dB/octave dual-section type with the crossover occurring at 1,500 Hz. Using a conservative design approach for the crossover (long life capacitors and low loss — low distortion inductors along with stranded hook-up wire that will not fracture with road handling), the crossover is as durable as the drivers.

The Model 100S has a four-position high-frequency control with attenuation capability from acoustically flat to -9 dB in 3-dB steps. This control allows for individual preferences or for compensation in different room environments, and it is conveniently recessed into the back panel.

Also on the back panel are dual 1/4-inch input jacks that facilitate the parallel connection of multiple Model 100S's. There are two precautions, however. First, be certain to employ interconnecting cables that maintain proper relative polarity between any two systems. (For example, if the coded lead is connected to the tip of the 1/4-inch phone plug at one end of the cable, the same connection should be made to other end of the cable.) Second, the impedance changes that result from parallel connection must be kept in mind. A single 100S has a nominal 8-ohm impedance. When two units are connected in parallel by using the paralleled input jacks the impedance drops to 4 ohms. By paralleling additional 100S units, the combined impedance will continue to drop (example: 3 units — 2.7 ohms; 4 units — 2 ohms). Many power amplifiers will not drive loads under four ohms, so consult the appropriate owner's information. The Entertainer® 100M will safely power two 100S systems on each of the two amplifier channels.

#### CONSTANT-DIRECTIVITY SPEAKER SYSTEM

The careful selection of coverage angle, woofer size and crossover frequency results in the creation of a special system type — a constant-directivity system. The result is a well-defined, 100° wide horizontal and vertical coverage zone of acoustic output in the critical frequency range from 500 to

There is no generally accepted standard for testing loudspeakers for power capacity. We expect each speaker and system to survive 8 hours continuous application of rated power without failure of any component or permanent change in performance. The test signal actually used in developmental testing of the 100S is shown in Figure 6.

As individual 100S systems are connected in parallel, their power ratings may be added together to reach a total input rating. For instance, if two systems are operated in parallel, 200 watts may be applied to the pair.

Whereas, the power handling specification applies to long-term application of power, the loudspeaker system is capable of handling four times the rated power for short duration peaks. For example: for a few milliseconds the system will handle 6-dB peaks. If the average input power level were 100 watts, then it would handle peak power inputs on the order of 400 watts.

The 100S makes an excellent floor monitor when the monitor support post (included) is threaded into an insert provided on the back of the cabinet. The system may be tilted back from horizontal to either 60° to 30°. The center of gravity is such that the system will remain perfectly stable. The post can be conveniently stored on the cabinet.

An optional wall mount kit (#WB-100S) may be purchased which enables permanent installation of the system. The kit permits angled or flush wall mounting.

Also available is a handsome vinyl cover (#VPC-100S) which will protect the system finish during transit. A hardboard insert prevents damage by protruding objects to the woofer and tweeter.

#### THE ELECTRO-VOICE "PA BIBLE"

The "PA Bible" is a practical, complete guide to solving the sound reinforcement problems faced by professional musicians. For the first time, the important fundamentals of high-performance sound system design and application are outlined and made useful to the performer. If you work with loudspeakers and microphones, you should have the EV "PA Bible."

A number of additions to the basic "Bible," each covering a separate topic of interest, have been produced. If you would like a copy of the "PA Bible," all existing and future additions, send your name and address with two dollars (\$2.00) to:

EV "PA Bible"  
Electro-Voice, Inc.  
600 Cecil Street  
Buchanan, Michigan 49107

#### 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); Electro-Voice, Inc., 3810 148th Avenue N.E., Redmond, WA 98052 (AC/206-881-9555); 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, Michigan 49107.

Specifications subject to change without notice.



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

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