

Electro-Voice®
a gulton company

PRO-12B® Wide-Range Two-Way Speaker

SPECIFICATIONS

Frequency Response, Front-Mounted in Recommended Sealed Enclosure, 10 Feet on Axis, Anechoic Environment, Swept One-Third Octave Pink Noise (see Figure 1):

- ± 3 dB - 70-16,000 Hz
- ± 6 dB - 50-20,000 Hz

Dispersion Angle Included by 6-dB-Down Points, Front-Mounted in Recommended Sealed Enclosure, 10-Foot Microphone Distance, Anechoic Environment, Indicated Octave Bands of Pink Noise (see Figure 3)

- 1000 Hz: 96°
- 8000 Hz: 80°
- 16,000 Hz: 60°

Sound Pressure Level, Anechoic Environment, Average, 100-5000 Hz Octave Bands,

- 10 feet, 1 watt into nominal impedance: 88 dB
- 4 feet, 60 watts into nominal impedance: 114 dB

Long-Term Average Power Capacity, Shaped Random Noise Input (see Power Handling Capacity section): 60 watts (21.9 volts RMS)

Impedance (see Figure 2)

Nominal: 8 ohms

Minimum: 6.5 ohms

Thiele-Small Driver Parameters, Nominal (see Special Note on Low-Frequency Performance section),

f_s
Free-air resonance frequency: 40 Hz

Q_{TS}
Total Q at f_s $\left[\frac{Q_{ES} Q_{MS}}{Q_{ES} + Q_{MS}} \right]$

.53

V_{AS}
Volume of air having same acoustic compliance as driver suspension: .15 m³ (5.3 ft³)

η_o
Half-space reference efficiency: 2.0%

V_D
Peak displacement volume of diaphragm (= $S_D \times \text{max}$): 154 cm³ (9.4 in³)

S_D
Effective diaphragm area: 506 cm² (78.5 in²)

X_{MAX}
Peak linear displacement of diaphragm: 3.04 mm (0.12 in.)

$P_{E(Max)}$
Thermally limited maximum input power: 60 watts

R_E
DC resistance of voice coil: 5.5 ohms

Dimensions,

Overall Diameter: 309.5 mm (12-3/16 in.)

Overall Depth: 152.4 mm (6 in.)

Depth behind mounting baffle, Front mounted: 136.5 mm (5-3/8 in.)

Mounting bolt circle: 294 mm (11-9/16 in.)

Mounting Hole Diameter, Eight Evenly Spaced Holes: 7.1 mm (9/32 in.)

Baffle Opening Diameter, Front or rear mounting: 279 mm (11 in.)

Net Weight: 5.5 kg (12 lb)

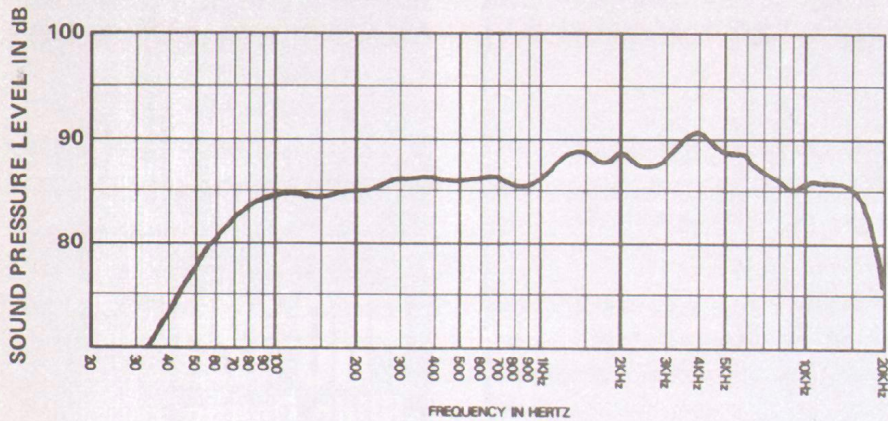


FIGURE 1 — On-Axis Frequency Response Using 1 Watt or 2.8 Volts RMS of Swept One-Third Octave Pink Noise Under Anechoic Conditions, Front Mounted in a 2.5 Cu. Ft. Box with Test Mike at 10 Ft.

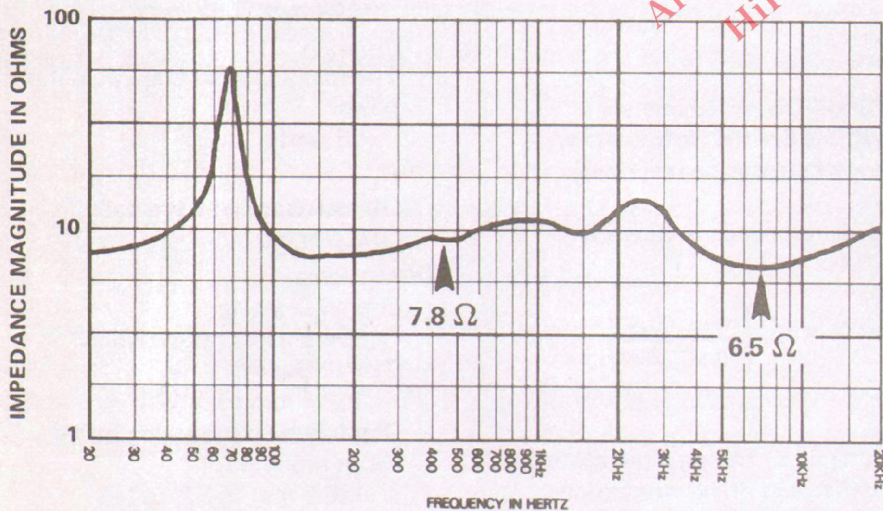


FIGURE 2 — Input Impedance vs. Frequency in a 2.5 Cu. Ft. Sealed Box

DESCRIPTION

The PRO-12B is a 12-inch, 2-way speaker designed for professional high-level, high-quality distributed sound systems. The PRO-12B employs a Super-Dome™ tweeter, capable of reproducing program material out to 18 kHz with uniform dispersion and flat frequency response.

The PRO-12B fills an important void between low-cost 8-inch speakers, suitable only for short throws, and the expensive 15-inch speakers previously required for long throws from 40-foot ceilings. Yet, the PRO-12B has a substantially smoother frequency response and a more uniform dispersion at mid and high frequencies than any other speakers, of its type, available.

SYSTEM LAYOUT

The PRO-12B was designed to provide maximum sound pressure levels in the direct field of approximately 95 to 100 dB when used in distributed systems installed in ceilings ranging from 20 to 30 feet in height. Polar response has circular symmetry and sufficient beam width at 10 kHz so that speaker spacings nearly equal to ceiling height may be used with excellent uniformity of high-frequency response, even along diagonal lines between speaker centers (note Figure 3).

The directional characteristics of the PRO-12B in the recommended 2.5 cubic feet sealed enclosure were measured by running a set of polar responses, in E-V's large anechoic chamber, at each octave center frequency. The test signal was octave bandwidth-limited pink noise centered at the indicated frequencies in Figure 3.

RECOMMENDED ENCLOSURES

Sealed

It has been determined that for the best combination of low-frequency response and sealed-box size, a 2.5 cubic foot enclosure should be used. A larger enclosure will provide additional low-frequency response below 70 Hz at the sacrifice of response in the 70 to 200 Hz range with no increase in maximum acoustic output at any frequency (note Figure 4). Reduced low-frequency response and bass peaking will result in using a smaller enclosure as indicated on the same graph.

Vented Systems

If additional low-frequency response is desired with a given box size, a vented

© beim Hersteller
Archiv Michael Otto
HiFi-Classic.de

box may be used. A 2.5 cubic foot vented enclosure tuned to 35 Hz will have essentially the same low-frequency response as a 6 cubic foot sealed enclosure. Box tuning may be accomplished by using a vent with an area of 6.6 square inches and a length of 3.9 inches.

An additional 3/4 of an octave of low-frequency response may be realized by tuning a 6 cubic foot enclosure to 40 Hz (note Figure 4). Tuning may be accomplished by using a vent with a depth of 0.75 inches and an area of 14 square inches.

POWER HANDLING CAPACITY

Shaped random noise was used to provide a very realistic single-number power rating. Like normal music and voice program, noise contains a wide range of frequencies and has (unlike sine wave signals) instantaneous peaks many times the long-term average level. Unlike normal program, however, noise is repeatable and is therefore useful as a test signal.

To test the PRO-12B, a filter was designed to roll off pink noise at 12 dB per octave below 40 Hz and 6 dB per octave above 4000 Hz. (Pink noise is a particular type of random noise with equal energy per octave.) This frequency spectrum is substantially more demanding than typical voice or music program material yet is not as unrealistically demanding as un-shaped pink noise. The PRO-12B will handle 60 watts (21.9 volts true RMS) of the shaped signal for 8 hours. Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 240 watts (43.8 volts peak).

AMPLIFIER POWER RECOMMENDATIONS

Where accidental long-term feedback or heavy clipping of program material can be avoided, the PRO-12B can be safely used with amplifiers capable of delivering 120 continuous (sometimes called average or "RMS") sine wave watts into 8 ohms. (A typical 120-watt amplifier will deliver the 240-watt peaks referred to in the Power Handling Capacity Section.)

Where more conservative operation is desired, amplifiers or constant-voltage transformers in the 30-watt range are appropriate. Even with heavily clipped program material or sustained feedback, such amplifiers are unlikely to damage the PRO-12B.

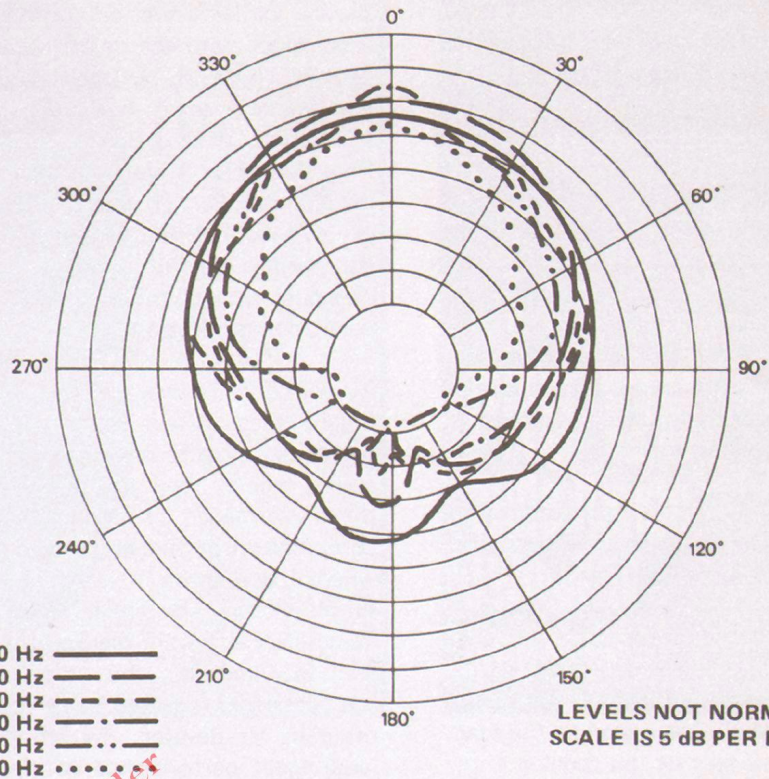


FIGURE 3 — Polar Response Using 4 Volts RMS of Octave-Band-Limited Pink Noise Under Anechoic Conditions Front Mounted in a 2.5 Cu. Ft. Box with Test Mike at 10 Ft.

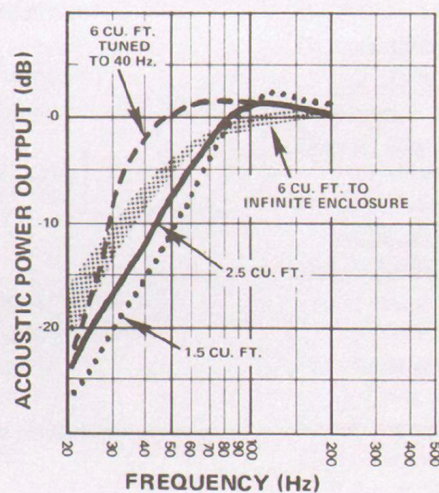


FIGURE 4 — Low-Frequency Acoustic Power Output in Various Enclosures

SPEAKER MOUNTING

The PRO-12B may be front or rear mounted, although front mounting is preferred for a more uniform frequency response and is usually more convenient. For simple front mounting, the convenient SMH-1 mounting accessory is recommended. Complete hardware and mounting instructions are included with the SMH-1.

For standard front mounting, the bolts must have fillister heads to seat down in the recess of the speaker frame. T-nuts are recommended to facilitate secure mounting. It is important that recommended baffle openings and mounting hole locations be followed as stated in the specifications table.

IMPORTANT! When front mounting, the screw head must fit down into the front gasket cutout.

Sealing of the speaker is accomplished with the adhesive-backed foam gasket segments. Remove the protective paper and apply the gasket to the rear mounting surface of the speaker rim, making certain that the holes in the gasket line up with the mounting holes in the speaker frame.

Rear mounting requires the same diameter cutout and screw circle as front mounting. Other comments regarding the use of T-nuts apply to rear mounting as well. Do not use adhesive-back gasket segments for rear mounting.

SPECIAL NOTE ON LOW-FREQUENCY PERFORMANCE

The recommended enclosures and associated performance specifications shown earlier were determined in accordance with the definitive analysis of A.N. Thiele, R. H. Small, and others (for example, see A. N. Thiele, "Loudspeakers in Vented Boxes," *J. Audio Eng. Soc.*, Part 1, vol. 19, May 1971, pp 382-391; Part II, vol. 19, June 1971, pp. 471-483). Other vented box sizes and tunings are quite feasible and may give performance more suitable for a particular application.

By applying the work of Thiele and Small, Electro-Voice engineers developed a computer program which easily, quickly, and accurately predicts the performance of any speaker-box combination at the frequency range where the diaphragm is acting as a simple piston. The Thiele-Small Driver Parameters shown in the Specifications Section include the speaker characteristics required by the computer program to develop the small-and large-signal performance of a given speaker and enclosure combination.

© beim Hersteller
Archiv Michael Otto
HiFi-Classic.de

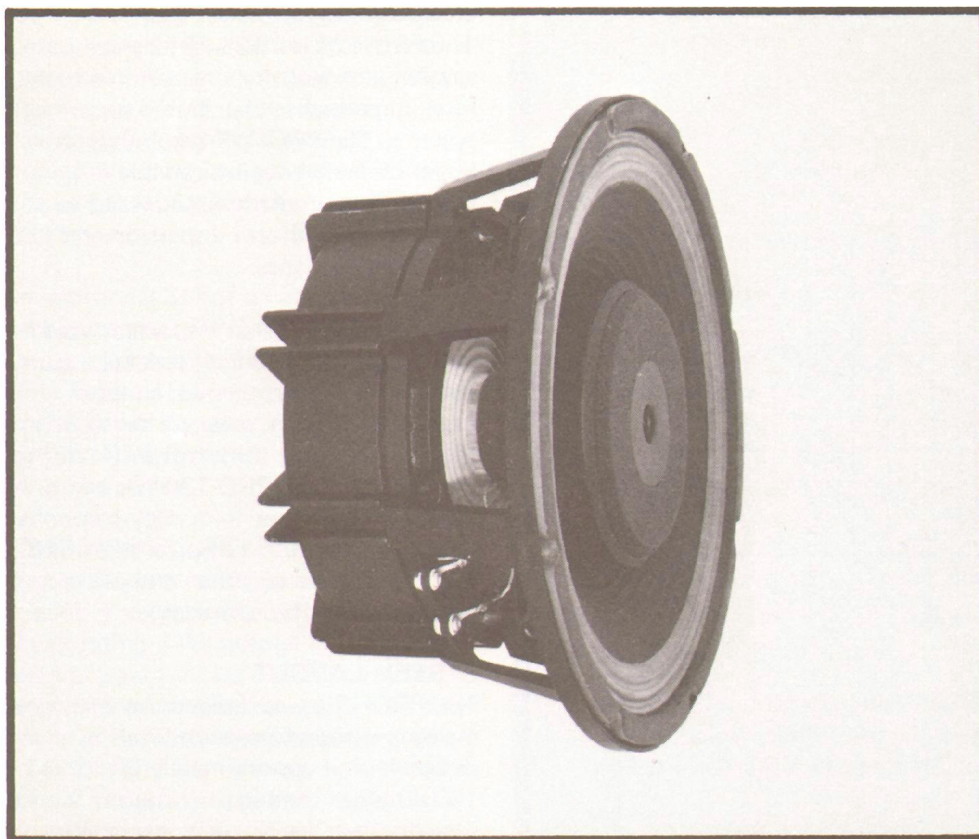
WARRANTY (Limited) —

Electro-Voice Professional Sound Reinforcement 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, Michigan 49107 (Phone: 616/695-6831) or Electro-Voice West, 8234 Doe Avenue, Visalia, California 93277 (209/625-1330,-1).

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

Specifications subject to change without notice.



Electro-Voice®
a gulton company

PRO-12B Wide-Range Two-Way Speaker

SPECIFICATIONS

Frequency Response, Front-Mounted in Recommended Sealed Enclosure, 10 Feet on Axis, Anechoic Environment, Swept One-Third Octave Pink Noise (see Figure 1):

- ± 3 dB — 70–16,000 Hz
- ± 6 dB — 50–20,000 Hz

Dispersion Angle Included by 6-dB-Down Points, Front-Mounted in Recommended Sealed Enclosure, 10-Foot Microphone Distance, Anechoic Environment, Indicated Octave Bands of Pink Noise (see Figure 3)

- 1000 Hz: 96°
- 8000 Hz: 80°
- 16,000 Hz: 60°

Sound Pressure Level, Anechoic Environment, Average, 100-5000 Hz Octave Bands,

- 10 feet, 1 watt into nominal impedance: 88 dB
- 4 feet, 60 watts into nominal impedance: 114 dB

Long-Term Average Power Capacity, Shaped Random Noise Input (see Power Handling Capacity section):

60 watts (21.9 volts RMS)

Impedance (see Figure 2)

- Nominal: 8 ohms
- Minimum: 6.5 ohms

Thiele-Small Driver Parameters, Nominal (see Special Note on Low-Frequency Performance section),

f_s
Free-air resonance frequency: 40 Hz

Q_{TS}
Total Q at f_s $\left[\frac{Q_{ES} Q_{MS}}{Q_{ES} + Q_{MS}} \right]$
.53

V_{AS}
Volume of air having same acoustic compliance as driver suspension
.15 m³ (5.3 ft³)

η_p
Half-space reference efficiency
2.0%

V_D
Peak displacement volume of diaphragm (= $S_D \times \max$)
154 cm³ (9.4 in³)

S_D
Effective diaphragm area
506 cm² (78.5 in²)

X_{MAX}
Peak linear displacement of diaphragm
3.04 mm (0.12 in.)

$P_{E(Max)}$
Thermally limited maximum input power
60 watts

R_E
DC resistance of voice coil
5.5 ohms

Dimensions,
Overall Diameter: 309.5 mm (12-3/16 in.)
Overall Depth: 152.4 mm (6 in.)
Depth behind mounting baffle, Front mounted: 136.5 mm (5-3/8 in.)
Mounting bolt circle: 294 mm (11-9/16 in.)
Mounting Hole Diameter, Eight Evenly Spaced Holes: 7.1 mm (9/32 in.)
Baffle Opening Diameter, Front or rear mounting: 279 mm (11 in.)

Net Weight:
5.5 kg (12 lb)

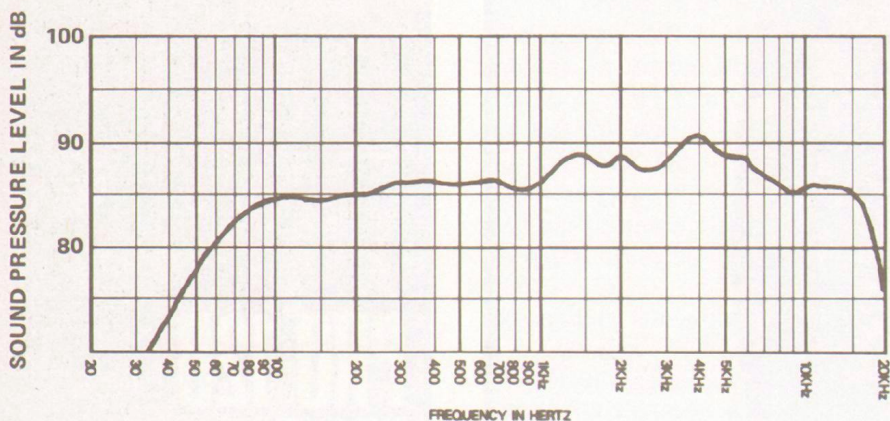


FIGURE 1 — On-Axis Frequency Response Using 1 Watt or 2.8 Volts RMS of Swept One-Third Octave Pink Noise Under Anechoic Conditions, Front Mounted in a 2.5 Cu. Ft. Box with Test Mike at 10 Ft.

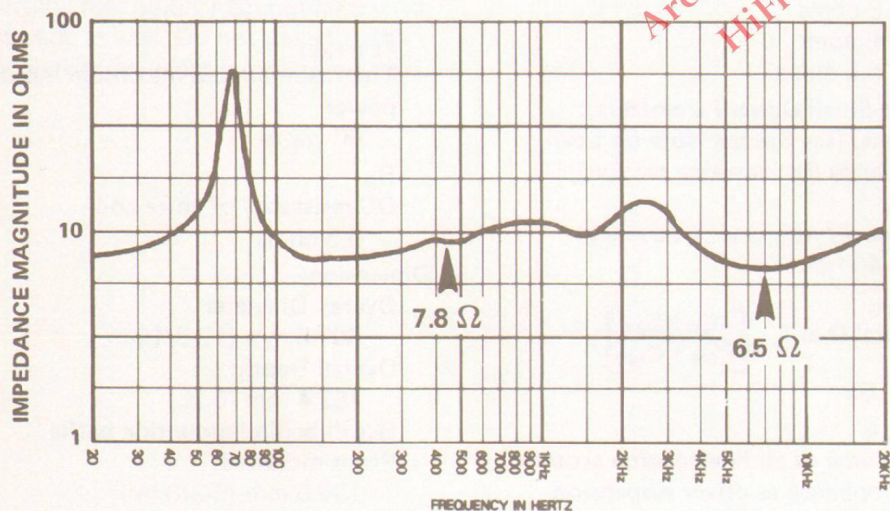


FIGURE 2 — Input Impedance vs. Frequency in a 2.5 Cu. Ft. Sealed Box

DESCRIPTION

The PRO-12B is a 12-inch, 2-way speaker designed for professional high-level, high-quality distributed sound systems. The PRO-12B employs a Super-Dome™ tweeter, capable of reproducing program material out to 18 kHz with uniform dispersion and flat frequency response.

The PRO-12B fills an important void between low-cost 8-inch speakers, suitable only for short throws, and the expensive 15-inch speakers previously required for long throws from 40-foot ceilings. Yet, the PRO-12B has a substantially smoother frequency response and a more uniform dispersion at mid and high frequencies than any other speakers, of its type, available.

SYSTEM LAYOUT

The PRO-12B was designed to provide maximum sound pressure levels in the direct field of approximately 95 to 100 dB when used in distributed systems installed in ceilings ranging from 20 to 30 feet in height. Polar response has circular symmetry and sufficient beam width at 10 kHz so that speaker spacings nearly equal to ceiling height may be used with excellent uniformity of high-frequency response, even along diagonal lines between speaker centers (note Figure 3).

The directional characteristics of the PRO-12B in the recommended 2.5 cubic feet sealed enclosure were measured by running a set of polar responses, in E-V's large anechoic chamber, at each octave center frequency. The test signal was octave bandwidth-limited pink noise centered at the indicated frequencies in Figure 3.

RECOMMENDED ENCLOSURES

Sealed

It has been determined that for the best combination of low-frequency response and sealed-box size, a 2.5 cubic foot enclosure should be used. A larger enclosure will provide additional low-frequency response below 70 Hz at the sacrifice of response in the 70 to 200 Hz range with no increase in maximum acoustic output at any frequency (note Figure 4). Reduced low-frequency response and bass peaking will result in using a smaller enclosure as indicated on the same graph.

Vented Systems

If additional low-frequency response is desired with a given box size, a vented

box may be used. A 2.5 cubic foot vented enclosure tuned to 35 Hz will have essentially the same low-frequency response as a 6 cubic foot sealed enclosure. Box tuning may be accomplished by using a vent with an area of 6.6 square inches and a length of 3.9 inches.

An additional 3/4 of an octave of low-frequency response may be realized by tuning a 6 cubic foot enclosure to 40 Hz (note Figure 4). Tuning may be accomplished by using a vent with a depth of 0.75 inches and an area of 14 square inches.

POWER HANDLING CAPACITY

Shaped random noise was used to provide a very realistic single-number power rating. Like normal music and voice program, noise contains a wide range of frequencies and has (unlike sine wave signals) instantaneous peaks many times the long-term average level. Unlike normal program, however, noise is repeatable and is therefore useful as a test signal.

To test the PRO-12B, a filter was designed to roll off pink noise at 12 dB per octave below 40 Hz and 6 dB per octave above 4000 Hz. (Pink noise is a particular type of random noise with equal energy per octave.) This frequency spectrum is substantially more demanding than typical voice or music program material yet is not as unrealistically demanding as un-shaped pink noise. The PRO-12B will handle 60 watts (21.9 volts true RMS) of the shaped signal for 8 hours. Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 240 watts (43.8 volts peak).

AMPLIFIER POWER RECOMMENDATIONS

Where accidental long-term feedback or heavy clipping of program material can be avoided, the PRO12-B can be safely used with amplifiers capable of delivering 120 continuous (sometimes called average or "RMS") sine wave watts into 8 ohms. (A typical 120-watt amplifier will deliver the 240-watt peaks referred to in the Power Handling Capacity Section.)

Where more conservative operation is desired, amplifiers or constant-voltage transformers in the 30-watt range are appropriate. Even with heavily clipped program material or sustained feedback, such amplifiers are unlikely to damage the PRO-12B.

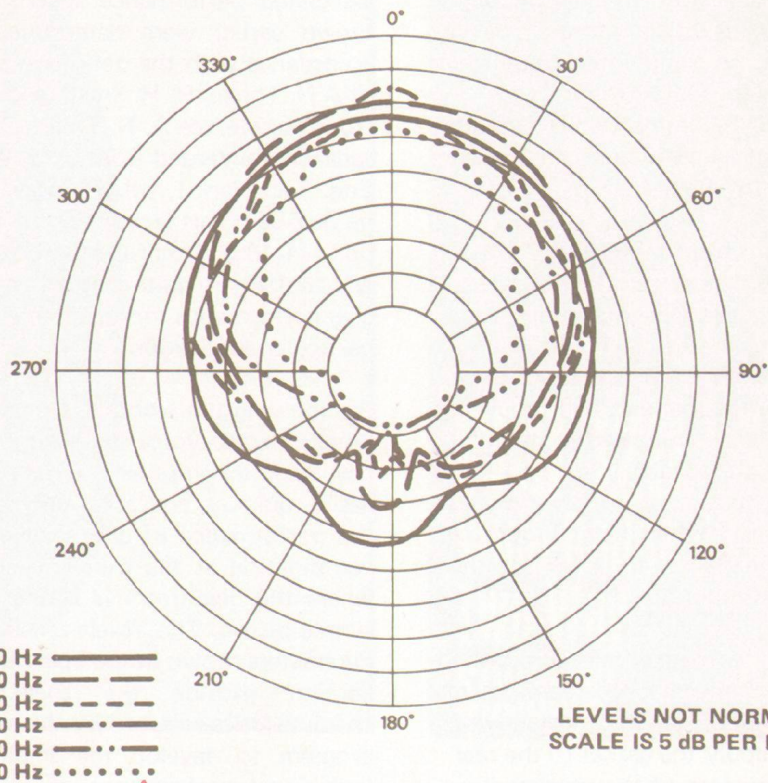


FIGURE 3 — Polar Response Using 4 Volts RMS of Octave-Band-Limited Pink Noise Under Anechoic Conditions Front Mounted in a 2.5 Cu. Ft. Box with Test Mike at 10 Ft.

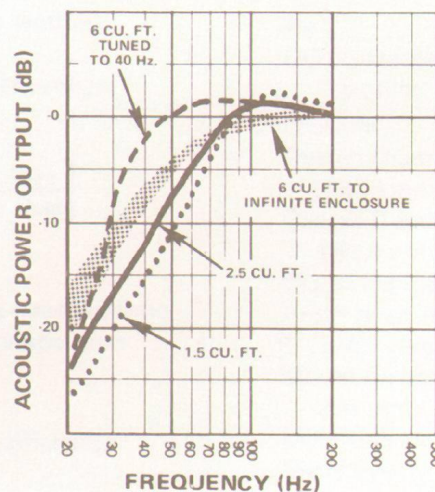


FIGURE 4 — Low-Frequency Acoustic Power Output in Various Enclosures

SPEAKER MOUNTING

The PRO-12B may be front or rear mounted, although front mounting is preferred for a more uniform frequency response and is usually more convenient. For simple front mounting, the convenient SMH-1 mounting accessory is recommended. Complete hardware and mounting instructions are included with the SMH-1.

For standard front mounting, the bolts must have fillister heads to seat down in the recess of the speaker frame. T-nuts are recommended to facilitate secure mounting. It is important that recommended baffle openings and mounting hole locations be followed as stated in the specifications table.

IMPORTANT! When front mounting, the screw head must fit down into the front gasket cutout.

Sealing of the speaker is accomplished with the adhesive-backed foam gasket segments. Remove the protective paper and apply the gasket to the rear mounting surface of the speaker rim, making certain that the holes in the gasket line up with the mounting holes in the speaker frame.

Rear mounting requires the same diameter cutout and screw circle as front mounting. Other comments regarding the use of T-nuts apply to rear mounting as well. Do not use adhesive-back gasket segments for rear mounting.

SPECIAL NOTE ON LOW-FREQUENCY PERFORMANCE

The recommended enclosures and associated performance specifications shown earlier were determined in accordance with the definitive analysis of A.N. Thiele, R. H. Small, and others (for example, see A. N. Thiele, "Loudspeakers in Vented Boxes," *J. Audio Eng. Soc.*, Part 1, vol. 19, May 1971, pp 382-391; Part II, vol. 19, June 1971, pp. 471-483). Other vented box sizes and tunings are quite feasible and may give performance more suitable for a particular application.

By applying the work of Thiele and Small, Electro-Voice engineers developed a computer program which easily, quickly, and accurately predicts the performance of any speaker-box combination at the frequency range where the diaphragm is acting as a simple piston. The Thiele-Small Driver Parameters shown in the Specifications Section include the speaker characteristics required by the computer program to develop the small-and large-signal performance of a given speaker and enclosure combination.

© beim Hersteller
Archiv Michael Otto
HiFi-Classic.de

WARRANTY (Limited) —

Electro-Voice Professional Sound Reinforcement 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, Michigan 49107 (Phone: 616/695-6831) or Electro-Voice West, 8234 Doe Avenue, Visalia, California 93277 (209/625-1330,-1).

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

Specifications subject to change without notice.