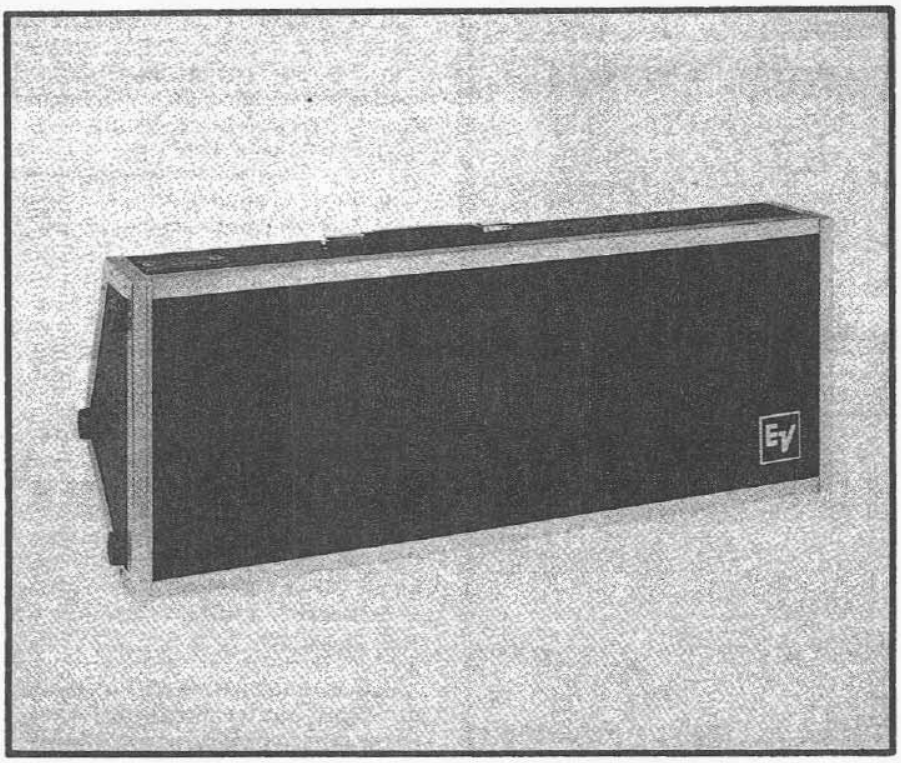

Electro-Voice®
a gulton company

Model HF12-3
High-Frequency Speaker System

SPECIFICATIONS

Nominal Frequency Response, 10 Feet on Axis, Swept One-Third Octave Pink Noise, Half-Space Anechoic Environment (see Figure 2):
90-16,000 Hz

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

Useable Low-Frequency Limit (10-dB-down point):
75 Hz

Half-Space Reference Efficiency:
4.3%

Long-Term Average Power Handling Capacity (see Power Handling Test section):
100 watts

Maximum Midband Acoustic Output Power:
4.3 watts

Sound Pressure Level, Anechoic Environment, Band-Limited Pink Noise Signal, 100 to 10,000 Hz (see Power Handling Test section for precise description of input spectrum),
At 4 Feet, Full Power Input:
116 dB
At 10 Feet, 1 Watt Input:
88 dB

Dispersion Angle Included by 6-dB-Down Points, Horizontal Plane, Long Enclosure Axis Horizontal, 500-16,000 Hz Octave Bands of Pink Noise, Anechoic Environment:
125° ± 30°

Dispersion Angle Included by 6-dB-Down Points, Vertical Plane, Long Enclosure Axis Horizontal, Indicated Octave Bands of Pink Noise, Anechoic Environment,
500-8000 Hz:
100° ± 25°
16,000 Hz:
50°

Transducer Complement:
EVM™12L 12" woofer;
VMR™6-½" vented midrange;
ST350B radial horn tweeter

Box Tuning Frequency:
96 Hz

Crossover Frequencies:
1000 & 4000 Hz

Tweeter Protection:
Hi Frequency Auto Limiter circuit

Impedance,
Nominal:
8 ohms
Minimum:
6 ohms

Input Connections:
Two parallel ¼" phone jacks

Enclosure Materials:
Black vinyl-clad ¾" plywood with aluminum trim

Enclosure Equipment:
Carrying handle and protective steel speaker grille

Mounting,
on Horizontal Surfaces:
Rubber feet for three orientations
on Stand or Suspended:
two ¼-20 T-nuts, each end

Optional Accessory:
480A stand for vertical mounting of enclosure

Dimensions (see Figure 1):
38.1 cm (15.0") high
97.3 cm (38.3") wide
33.8 cm (13.3") deep

Net Weight:
33.1 kg (73 lb)

Shipping Weight:
36.7 kg (81 lb)

DESCRIPTION & APPLICATIONS

The Electro-Voice HF12-3 is a low-profile, compact speaker system for both permanent and portable installations. The HF12-3's physical and acoustic properties complement the Electro-Voice LF118 sub-woofer. In conjunction with appropriate electronics, this combination provides an unusually flexible high-output, high-accuracy sound system that is ideal for playback of recorded music in the contemporary dance environment. The HF12-3's smooth frequency response (see Figure 2) and wide, uniform dispersion (see Figures 3 and 4) ensure that each individual within the speaker's nominal coverage pattern is treated to the same high-quality program material. Such performance is truly unusual in a high-output speaker system capable of reproducing 116 dB at 4 feet with full input power.

The foundation of HF12-3 performance is the EVM12L 12-inch woofer in an optimally vented enclosure. Midrange frequencies are reproduced by the unique VMR™ 6-½-inch vented cone midrange. The VMR provides high acoustic output without the dispersion and sound quality problems associated with the poorly designed horns that are frequently found in commercial music service. The highest octaves are perfectly dispersed by the 120° ST350B radial horn tweeter. The exclusive Hi Frequency Auto Limiting circuit positively prevents tweeter blowout.

The HF12-3 owes its mounting versatility to a low vertical profile and a unique shape which allows it to be oriented in a

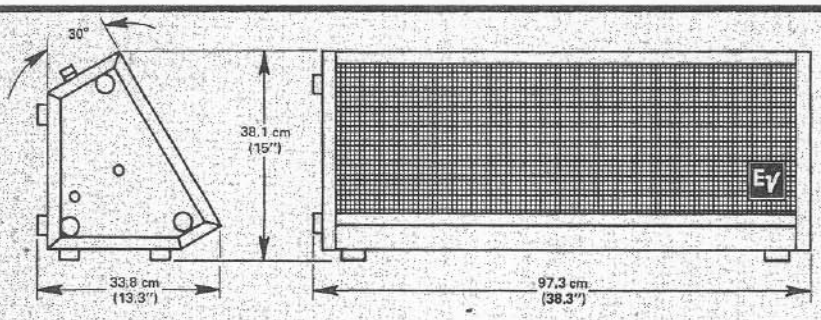

FIGURE 1 – HF12-3 Dimensions

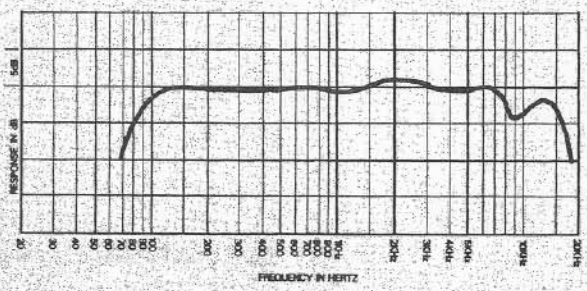

FIGURE 2 – HF12-3 Frequency Response
(Normal Mode, 10 Feet on Axis, Swept 1/3-Octave Pink Noise, Half-Space Anechoic Environment)

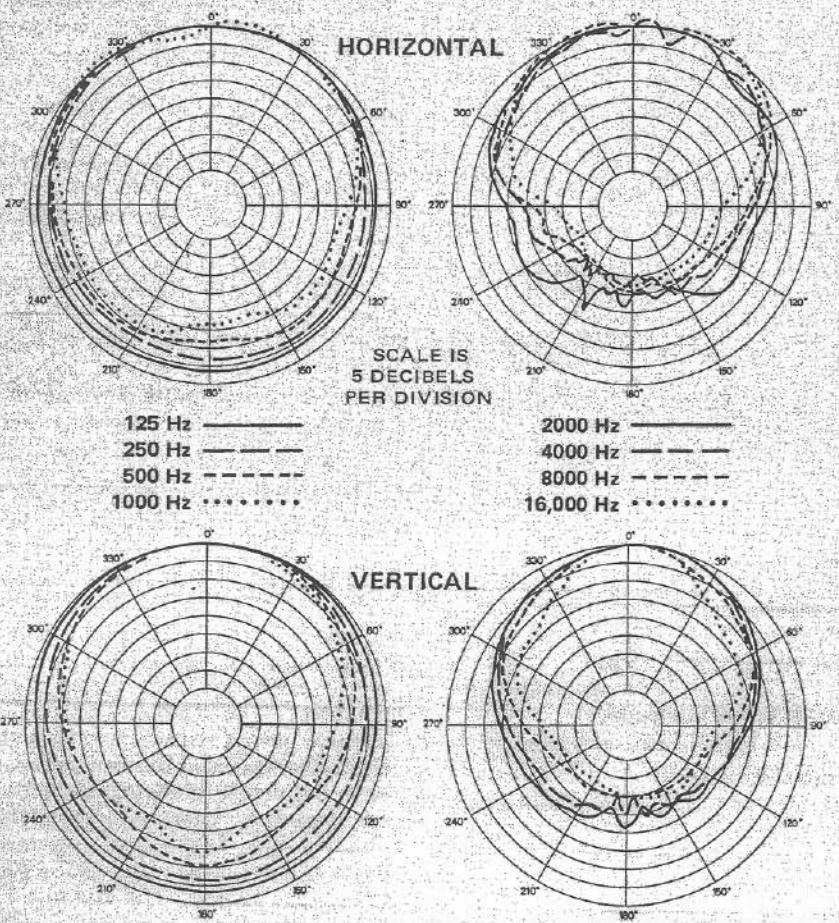

FIGURE 3 – HF12-3 Polar Response
(Octave Bands of Pink Nose, System Long Axis Horizontal, 10-Foot Microphone Distance, Anechoic Environment)

number of ways: (1) mounted on a low ceiling (or at a ceiling/wall junction) with a speaker axis decline of 30° relative to the ceiling, (2) similar mounting with a speaker axis decline of 60°, (3) mounted standing upright against a wall or in a corner, and (4) standing upright on the optional Electro-Voice 480A speaker stand. Integral rubber feet on two sides and one end facilitate placement on appropriate horizontal surfaces. T-nuts on each end permit hanging suspension.

The HF12-3's shape and acoustic performance make it also useful as a "fill" speaker in dance environment applications (without sub-woofer) and for assorted surround-speaker applications in the theatre or as a stage monitor for sound reinforcement. When vertical orientation is desired, along with the widest horizontal dispersion in the highest octave, the ST350B tweeter may be re-oriented by 90°.

Construction of the HF12-3 is elegant but rugged and functionally attractive. The enclosure consists of black vinyl-covered ¾-inch plywood with protective extruded aluminum trim. Speakers are protected by a sturdy steel grille. A vinyl carrying handle is provided for portable applications.

Refer to the following sections of this engineering data sheet for more detailed comment on HF12-3 performance and application.

HF12-3 SPECIAL APPLICATION NOTES

This engineering data sheet contains complete specifications and performance characteristics for the HF12-3. However, the most effective use of the HF12-3 depends on proper design into the total sound system and its physical environment. Separate HF12-3 ***Special Application Notes*** have been prepared, covering the following specific topics:

1. Powering the HF12-3.
2. Crossover and Typical System Configurations and Adjustments.
3. Placement and Orientation.

A copy of HF12-3 Special Application Notes may be obtained from the Advertising Department, Electro-Voice, Inc., 600 Cecil Street, Buchanan, Mich. 49107.

FREQUENCY RESPONSE

Frequency response was measured in a half-space anechoic (echoless) environment at 10 feet on axis with 4 volts of swept 1/3-octave pink noise. The frequency response curve for the HF12-3 is shown in Figure 2.

DISPERSION

The polar response curves for the HF12-3 are given in Figure 3. This data was taken in an anechoic environment with 4 volts of octave-band-centered pink noise applied to the speaker terminals. The measuring microphone was at a distance of 10 feet. The polar responses of Figure 3 cover both the horizontal (side-to-side) and vertical (up-and-down) planes, with the HF12-3's long axis placed horizontally. From the polar response curves, the 6-dB-down points were obtained and a beamwidth-versus-frequency plot was made. This information is displayed in Figure 4 and reveals an unusually constant, wide coverage angle in both the horizontal and vertical planes, over the entire frequency range. Coverage is particularly uniform in the horizontal (side-to-side) plane, where the widest coverage angle is usually required. Vertical (up-and-down) dispersion requirements are usually smaller and the (approximate) 50° coverage at 16,000 Hz is more than adequate in this context. (Where a vertical system orientation is desired, along with the widest dispersion of the highest frequencies in the horizontal plane, the HF12-3's tweeter may be rotated by 90°. See ***Tweeter Reorientation For Vertical System Placement*** section.) The polar response curves were used to develop the directivity factor R_θ (sometimes known as Q). This information is shown in Figure 5. The right-hand scale of Figure 5 shows the directivity index D_i.

POWER HANDLING TEST

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 interpret as 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 excursion). 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.

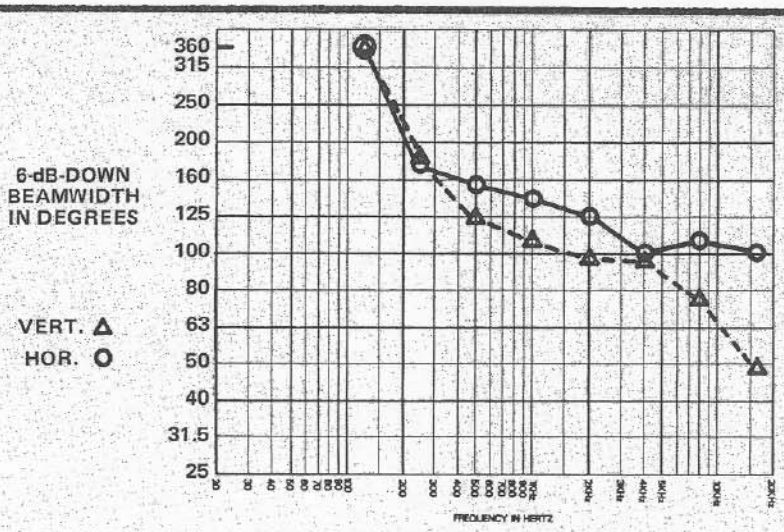

FIGURE 4 – HF12-3 6-dB-Down Beamwidth versus Frequency
(Octave Bands of Pink Noise, System Long Axis Horizontal, 10 Foot Microphone Distance, Anechoic Environment)

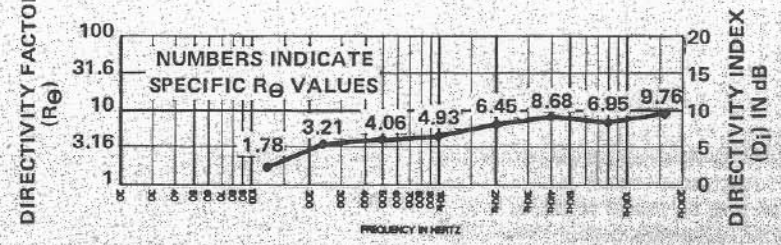

FIGURE 5 – HF12-3 Directivity Factor and Directivity Index
(Derived from Octave Band Horizontal and Vertical Polar Responses)

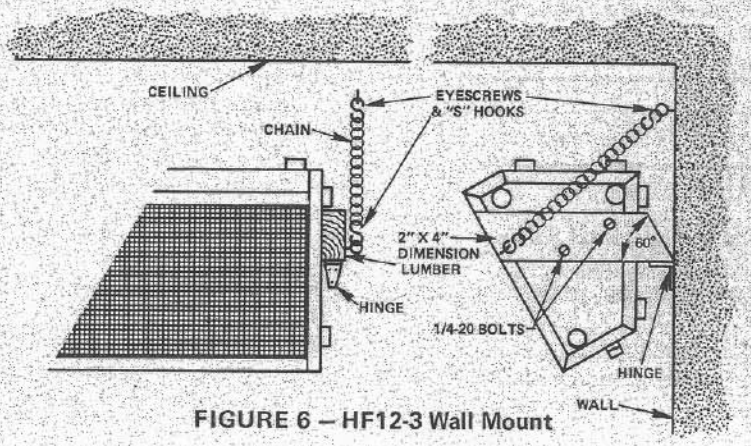

FIGURE 6 – HF12-3 Wall Mount

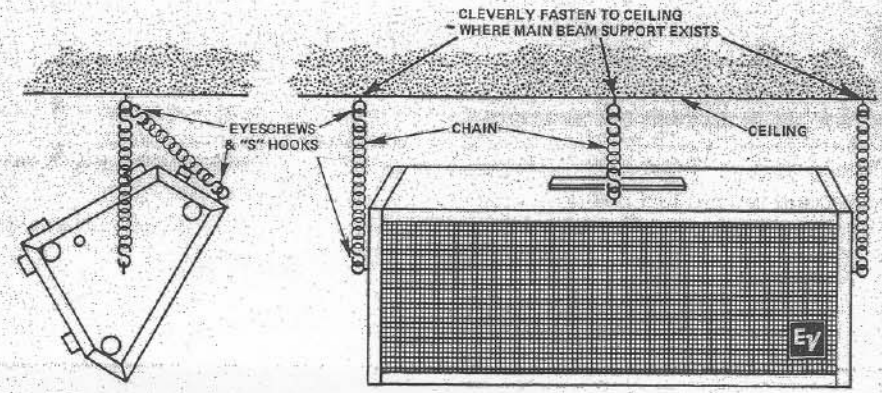

FIGURE 7 – HF12-3 Ceiling Suppension Mount

The HF12-3 has been specifically tested for 24 hours as follows. The output of a pink noise generator is fed to a shaping filter where the frequency spectrum is rolled off at 6 dB per octave beginning at 100 Hz and 10,000 Hz. (Pink noise is a particular type of random noise with equal power in every octave.) This shaped signal is sent to the power amplifier with the long-term average power set at 100 watts into 8 ohms (28.3 volts true RMS). Amplifier clipping sets instantaneous peaks at about 6 dB above the average, or 400 watts (approximately 55 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

HI FREQUENCY AUTO LIMITER

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. The circuit responds instantaneously and is not dependent on slow moving mechanical parts. The Hi Frequency Auto Limiter incorporates six solid state devices and a power resistor with appropriate heat sink.

MOUNTING

Mounting on Horizontal Surfaces

Two sides and one end of the HF12-3 have large rubber feet to facilitate placement on horizontal surfaces. See Figure 1 for feet location.

Mounting on a Wall

Refer to Figure 6. Several common hardware items are required. Cut two 20" lengths of 2" x 4" dimension lumber with ends angled as shown in the figure. Attach these boards to the ends of the HF12-3 by removing the two end bolts, drilling corresponding holes in the boards, and attaching the boards with 2-½" ¼-20 bolts. To the outside of each board, located near the front as shown in the figure, install a screweye (¼" diameter is good). To the lower rear edge of each board, attach a 1-½" wide hinge, with the hinge point at the extreme rear of the board. Mount the hinges on the wall. Attach two screweyes of ¼" diameter to the wall, approximately 19 inches above the HF12-3 and in the plane of the attached boards. Attach chains between the wall-mounted screweyes and the board-mounted screweyes. "S" hooks may be used for this attachment. Aim the HF12-3 by appropriate adjustment of chain length.

Mounting on a Ceiling

The HF12-3 may be suspended from three ceiling-mounted eyebolts or screweyes. Refer to Figure 7. Several common hardware items are required. Remove both centermost enclosure end bolts and replace with 1" ¼-20 eyebolts. A screweye of ¼" diameter should be added to the top of the HF12-3 enclosure, 18-¾ inches from the ends and at a place directly above the VMR midrange and near the carrying handle. Connect chains to the eyebolts installed in both enclosure ends. Attach the free ends of the chains to the two widely spaced ceiling-mounted eyebolts/screweyes. Connect another chain between the third enclosure-mounted screweye and the third ceiling-mounted eyebolt/screweye. "S" hooks may be used for these connections. Adjust this chain length for the desired speaker aiming.

Mounting on a Stand

Both ends of the HF12-3 contain two ¼-20 T-nuts with bolts. ***Stand mounting should be on the end near the woofer for proper balance and sound coverage.*** The T-nuts are spaced 3 inches apart to fit the optional E-V 480A or the Atlas CS100 stands. (Overall height of the 480A is 58 inches; the Atlas CS100 is 46 inches.)

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, CA 93277 (209/625-1330,-1)

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

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107.

Specifications subject to change without notice.

Part Number 53811–033

a Gulton COMPANY **ELECTRO-VOICE, Inc., 600 CECIL ST., BUCHANAN, MICH. 49107**

MANUFACTURING PLANTS AT ■ BUCHANAN, MICH. ■ NEWPORT, TENN. ■ SEVIERVILLE, TENN. ■ GANANOQUE, ONT. ■ LITHO IN U.S.A.