

DMS-2122/42 Series

DeltaMax™ Two-Way, Mid-Bass/High-Frequency Sound-Reinforcement System

- Ultracompact/high-level, two-way design
- Use with DMS-2181T low-frequency system
- Special design, 12-inch mid-bass drivers (40° x 20°)
- Coaxially mounted HF section includes ND4 compression drivers for very high output, extremely rigid piston range performance
- Front dimensions identical to DMS-2181
- Shell dimensions and rigging identical to DMS-1183/64 and DMS-2181T

Description

The Electro-Voice DMS-2122/42 is a two-way mid-bass/high-frequency loudspeaker system designed for use with the DMS-2181T subwoofer for full-range applications. The design of the DMS-2122/42 is optimized for permanent-installation and touring-sound applications. The unique configuration yields full-spectrum, high-level output and maintains vocal clarity and intelligibility. The DMS-2122/42 may be used with either the Electro-Voice Dx34A digital crossover system or any high-quality, signal-controller system.

The mid-bass section of the DMS-2122/42 consists of dual, horn-loaded, 12-inch loudspeakers specifically designed for the DMS-2122/42. Extended horn length and diaphragm loading ratio employed allow operation to 140 Hz. This low-frequency limit and the high-frequency cut-off of 1,480 Hz provide uniform loading over the entire frequency spectrum covered by this device with a constant-directivity 40° x 20° pattern. Two 40° x 20° high-frequency devices are coaxially mounted in the mid-bass horn. The high-frequency compression drivers are Electro-Voice neodymium-based magnetic

systems. The ND4 drivers feature very high output and wide pistonic output. The ND4 driver and high-frequency horn combination offer extremely smooth performance from 1,480 Hz to above 18,000 Hz.

The DMS-2122/42 is a biamp-ready enclosure constructed of 18-mm, 13-ply birch plywood and is available in a painted, textured black flying version with a standard two-point (two tracks on top, two tracks on bottom) flying system (DMS-2122/42PF).

Applications

The DMS-2122/42 is ideally suited for high-level, high-fidelity applications. For full-range applications, the DMS-2122/42 may be combined with either the DMS-2181T or DMS-2181 subwoofer loudspeaker systems. The combined systems would be powered as a triamped system, offering accurate vocal reproduction with powerful low-frequency response. Both the DMS-2181T and DMS-2181 utilize two EVX-180A 18-inch woofers in a manifolded enclosure optimized for maximum acoustic low-frequency output. The DMS-2122/42, with its long-throw 40° x 20° coverage pattern, may be combined with the shorter-throw, 60°x40° DMS-1183/64 loudspeaker system.

The DMS-2122/42 utilizes a trapezoidal enclosure that has identical dimensions and rigging hardware as the DMS-1183/64 and DMS-2181T systems. The DMS-2181 utilizes a rectangular enclosure that has the same frontal dimensions as the DMS-2122/42, but a slightly different rigging hardware layout due to the different enclosure shape.

Power-Handling Test

Electro-Voice components and systems are manufactured to exacting standards to ensure reliability in continuous use in arduous real-life conditions. Besides utilizing industry-standard power tests, extreme in-house power tests, which push the performance boundaries of the loudspeakers, are also performed for an extra measure of reliability. The DMS-2122/42 systems are rated per ANSI/EIA RS426-A 1980 Loudspeaker Power-Rating, Full-Range Test, which uses a shaped-random-noise signal to simulate typical music to test the mechanical and thermal capabilities of the loudspeakers. The Dx34A digital electronic unit was used to provide the necessary crossover filters and equalization during power testing. Specifically, the DMS-2122/42 passes the ANSI/EIA RS426-A power test with the following test

DeltaMax™ DMS-2122/42 Loudspeaker System

parameters:

Mid-bass Section:

$P_{E(MAX)}$:	600 watts
Test Voltages:	40.3 volts rms
	80.6 volts peak
$R_{SR} (1.15 R_E)$:	2.71 ohms

High-Frequency Section:

$P_{E(MAX)}$:	120 watts
Test Voltages:	27.4 volts rms
	54.8 volts peak
$R_{SR} (1.15 R_E)$:	6.27 ohms

Crossover, Equalization And Time-Delay Controller

The DMS-2122/42 speaker system was designed as an integrated package that utilizes the Electro-Voice Dx34A digital crossover system. Optimal performance of the DMS-2122/42 speaker system can only be assured when using the above controller. The Dx34A features 160-Hz and 1,480-Hz crossover frequencies utilizing 24-dB-per-octave Linkwitz-Riley filters, and contains time delay and equalization for optimum performance of the DMS-2122/42.

Electrical Connection And System Wiring

Electrical connections to the DMS-2122/42 are made on the back of the enclosure via an 8-pin connector. There are two connectors on the input panel to allow paralleling of other DMS-2122/42 systems. The Neutrik Speakon® NL8MPR is used for both connections. The pin assignments are as follows:

Pin 1+:	No Connection
Pin 1-:	No Connection
Pin 2+:	No Connection
Pin 2-:	No Connection
Pin 3+:	MB(+)
Pin 3-:	MB(-)
Pin 4+:	HF(+)
Pin 4-:	HF(-)

The wiring diagram of the loudspeaker system is shown in figure 7. The electrical impedance is shown in Figure 6.

Amplifier Recommendations

Power amplifiers with the following ratings are recommended for use with the DMS-2122/42 speaker systems:

MB: 300-600 watts continuous into 8 ohms.

HF: 125-250 watts continuous into 8 ohms.

DMS-2122/42 speakers may be paralleled only with other DMS-2122/42 speakers if the amplifier is capable of delivering full power at the lower impedances. The use of amplifiers with lower power ratings is acceptable; however, the full-power capabilities of the DMS speakers will not be realized. The use of amplifiers with significantly higher power ratings will generate maximum dynamic range and fidelity, but care must be utilized for longer duration signals as mechanical and thermal damage is possible in the system.

Flying the DMS Systems

A manual entitled the *DMS Flying Manual* is available from Electro-Voice, and is included with each flying DMS loudspeaker system. A brief introductory overview is included here. The *DMS Flying Manual* should be consulted for complete structural specifications and detailed information on safely suspending and using the DMS systems.

The DMS-2122/42PF is the version of the DMS-2122/42 loudspeaker system that includes flying hardware. The DMS systems incorporate a unique two-point flying system that permits a wide range of vertical angle adjustment, and offers maximum flexibility in array design for both touring sound and permanent installations. The quick-release, aircraft-rated heavy-duty L-track-type hardware design allows arrays of loudspeakers to be assembled (and disassembled) very quickly, and offers such flexibility in the vertical angling of cabinets that pull-up points are usually unnecessary. Furthermore, all of the flying DMS loudspeaker models include the same rigging hardware, allowing different models to be mixed as necessary throughout an array.

The working-load limit (for an 8:1 safety factor) for each rigging point on the DMS loudspeaker enclosure is 227 kg (500 lb) for a 0° pull angle and 170 kg (375 lb) for a 90° pull angle when used with the New Haven NH32101-2 double-stud fitting, and 113 kg (250 lb) at any angle when used with the New Haven NH8192-2S or Ancra 42546-10 single-stud fittings with locking pins. The working-load limit (for an 8:1 safety factor) for the overall enclosure is 453 kg

(1,000 lb). (Consult the *DMS Flying Manual* for specific structural ratings and limitations.) The enclosures may be oriented with the rigging track on the sides of the enclosure, or on the top and bottom, and may be daisy-chained together as long as the safety factor is 8:1 or greater, and local regulations are met. For fire safety and additional structural strength in both flying orientations, top-to-bottom and side-to-side metal straps link the rigging track inside the enclosure. All associated rigging is the responsibility of others.

CAUTION: The DMS loudspeaker system should be suspended overhead only in accordance with the procedures and limitations specified in the *DMS Flying Manual* and manual updates notices.

Field Replacement

The DMS-2122/42 may be serviced as follows. To access the 12-inch midbass drivers, remove the mid-bass horn and the mid-bass-horn throat extension. The 12-inch woofers may then be unbolted and removed. To access the high-frequency drivers, remove the mid-bass horn. The high-frequency driver may be unscrewed from the high-frequency horn for service.

The following replacement parts are available from EVI Audio Service in Buchanan, Michigan:

MB: Complete woofer; EV Part No. 812-2776

HF: Diaphragm kit; EV Part No. 82816-XX

Architects' and Engineers'

Specifications:

The loudspeaker system shall be a two-way biamped system. The system shall have a horn-loaded mid-bass section with two 12-inch drivers, each having a 2.5-inch voice coil and a nominal impedance of 8 ohms. The mid-bass drivers shall each have a power-handling capacity of 300 watts for 8 hours (as per ANSI/EIA RS-426A). The mid-bass horn shall have a 40° x 20° coverage pattern. The high-frequency section shall be coaxially mounted in the mid-bass horn and shall each be capable of handling 60 watts, 1,480- to 20,000-Hz when pink noise of a 6-dB crest factor is applied for



DeltaMax™ DMS-2122/42 Loudspeaker System

two hours (as per AES 2-1984 and ANSI S4.26-1984 standards) and shall each have a nominal impedance of 16 ohms. The loudspeaker enclosure shall be constructed of 18-mm, 13-ply birch and shall be trapezoidal in shape. The wedge angle shall be 18°.

The system shall be capable of very-high-level operation with a bandwidth of 140 Hz to 16,000 Hz. The system dimensions shall be 572 mm (22.50 in.) wide by 914 mm (36.00 in.) high by 759 mm (29.88 in.) deep. The system shall employ L-track-type flying hardware with two tracks on the enclosure top and two tracks on the enclosure bottom. The loudspeaker shall be the Electro-Voice DMS-2122/42.

Uniform 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 EVI Audio Service or any of its authorized service representatives. Obtaining Warranty Service: To obtain warranty service, a customer must deliver the product, prepaid, to EVI Audio 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 EVI Audio 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.

Electro-Voice Accessories are guaranteed against malfunction due to defects in materials or workmanship for a period of one (1) year from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

Electro-Voice Flying Hardware (including enclosure-mounted hardware and rigging accessories) is guaranteed against malfunction due to defects in materials or workmanship for a period of one (1) year from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

For warranty repair, service information, or a listing of the repair facilities nearest you, 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.

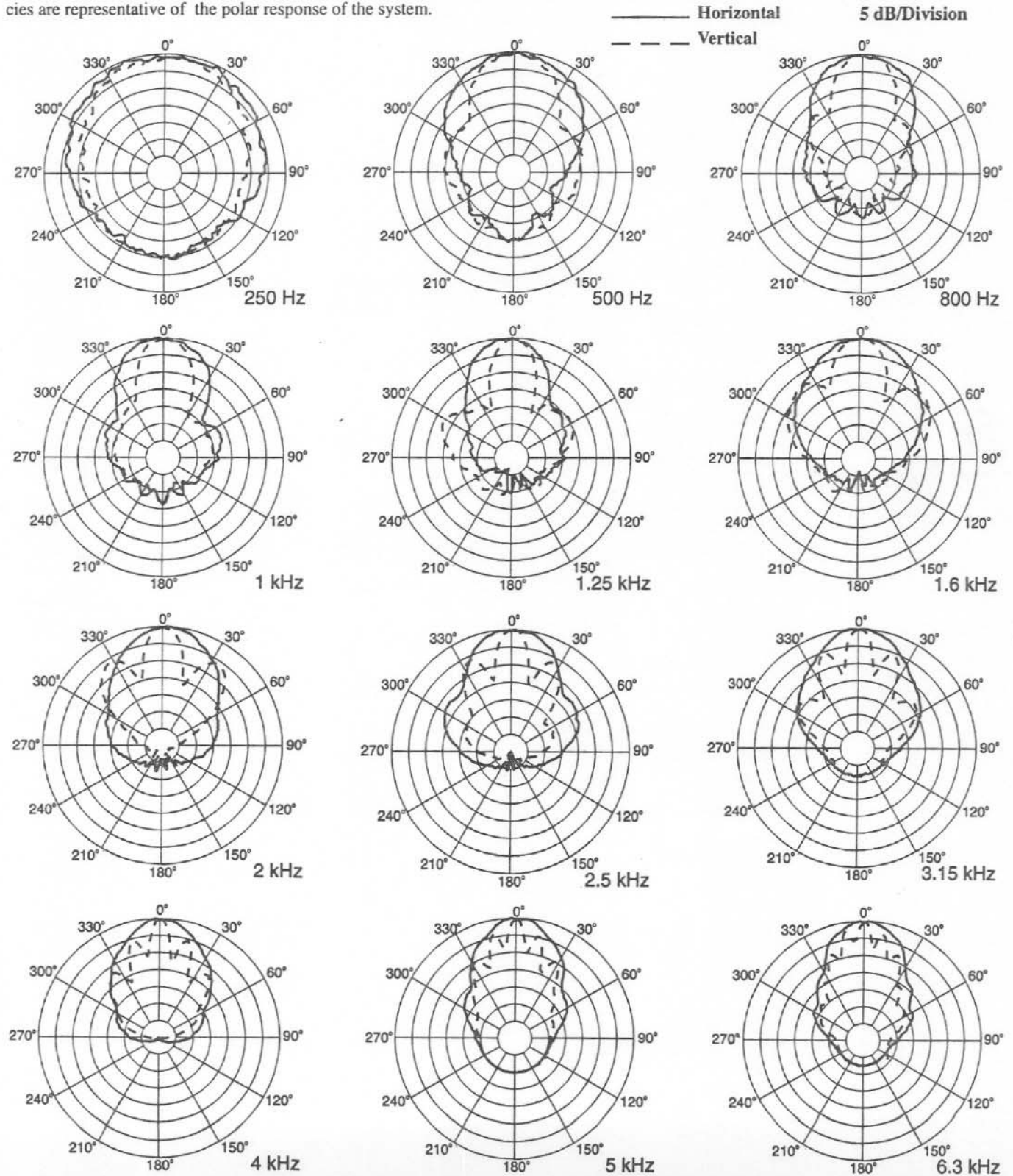
Specifications subject to change without notice.

DeltaMax™ DMS-2122/42 Loudspeaker System

Figure 1—Polar Response

The directional response of the system was measured in an anechoic environment at a distance of 6.1 m (20 feet) using 1/3-octave-filtered pink noise with a full spherical measurement system. The Dx34A digital electronic unit was used to provide the necessary crossover filters, equalization and time delay. The polar response of the loudspeaker system at selected 1/3-octave frequencies is shown. The selected frequencies are representative of the polar response of the system.

DeltaMax™ DMS-2122/42 Loudspeaker System



DeltaMax™ DMS-2122/42 Loudspeaker System

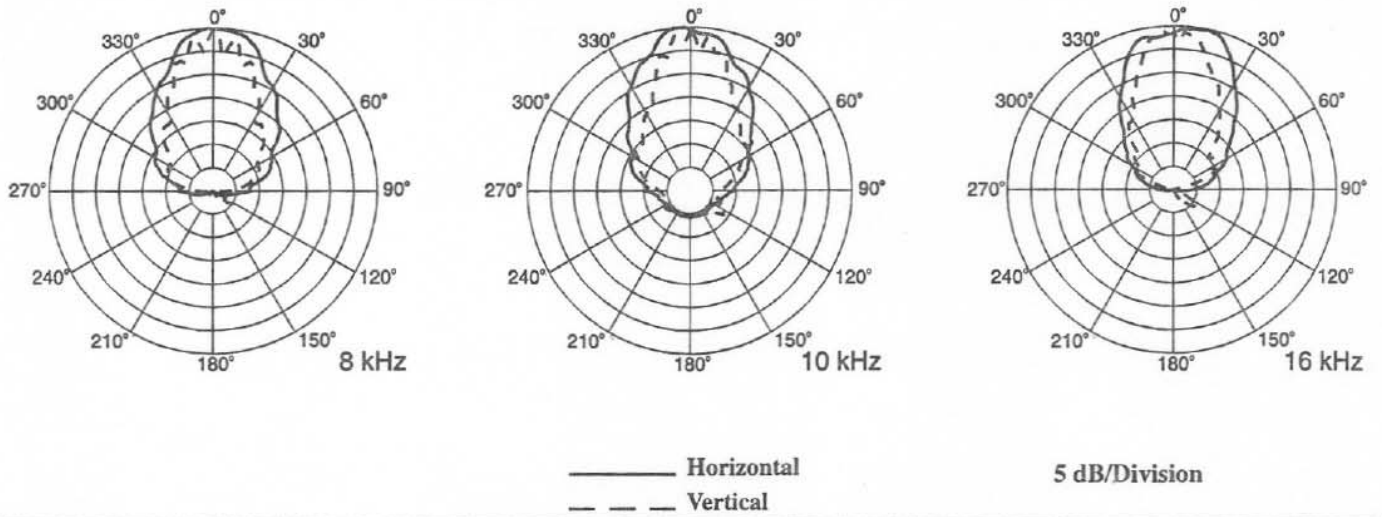


Figure 2—Frequency Response

The frequency response of the system was measured on axis in the farfield in an anechoic environment using a swept sine-wave signal. The Dx34A digital electronic unit was used to provide the necessary crossover filters, equalization and time delay. One watt of power (2.00 volts rms at 500 Hz) was applied to the midband of the midbass section. The sound-pressure level was normalized for an equivalent one-meter distance.

DMS-2122/42 Frequency Response, SPL(dB) vs Freq(Hz), 11/21/96 (F2122425)

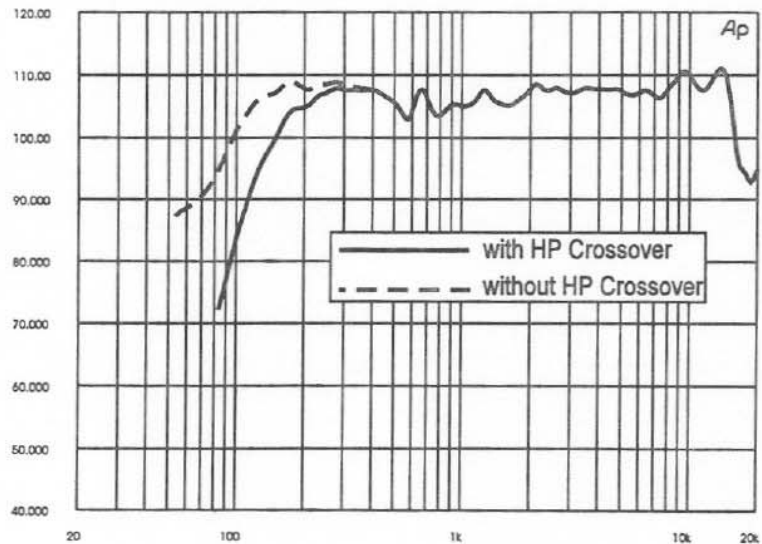
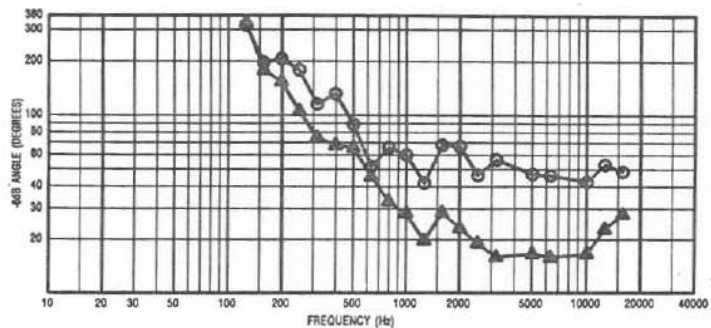


Figure 3—Beamwidth

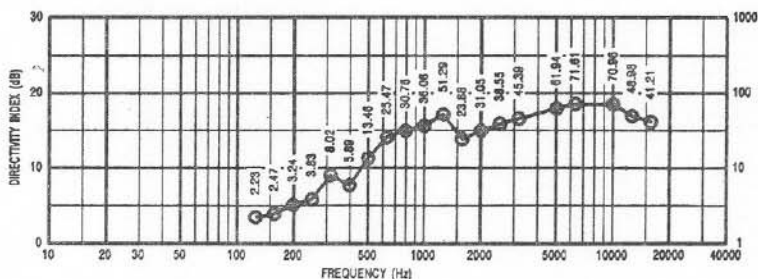
The beamwidth of the system, (i.e., the included horizontal and vertical coverage angles at the -6-dB points) was measured with a full spherical measurement system as described in *Polar Response*.



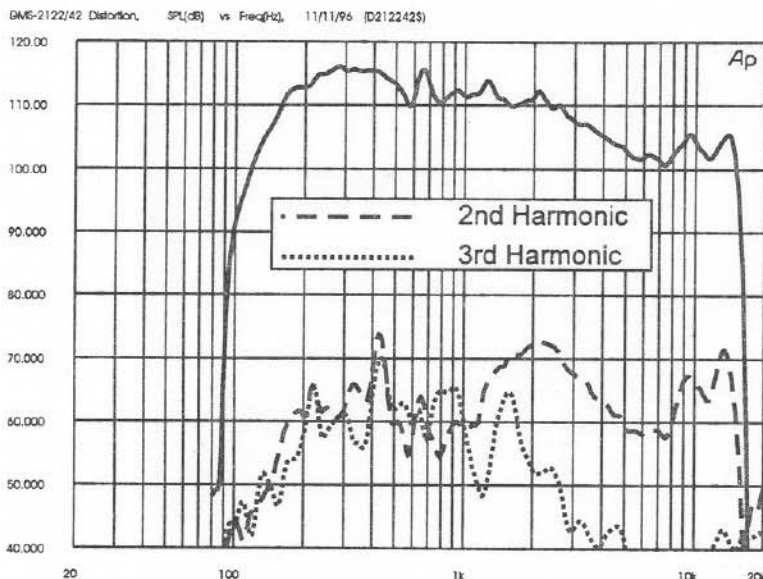
Horizontal - ?
Vertical - ?

Figure 4—Directivity

The directivity index, D_i , and directivity factor, R_0 , of the system were measured with a full spherical measurement system as described for the Polar Response.


Figure 5—Distortion

Distortion for the system was measured on axis in the farfield in an anechoic environment with an input signal that would result in a sound-pressure level of 115 dB at one meter. The Dx34A digital electronic unit was used to provide the necessary crossover filters, equalization and time delay. A frequency spectrum typical of close-miked rock music was employed. The sound-pressure level was normalized for an equivalent one-meter distance. Plots of second and third harmonic distortion are shown referenced to the fundamental.



DeltaMax™ DMS-2122/42 Loudspeaker System

Figure 6—Impedance

The impedance of each frequency band of the system was measured in an anechoic environment.

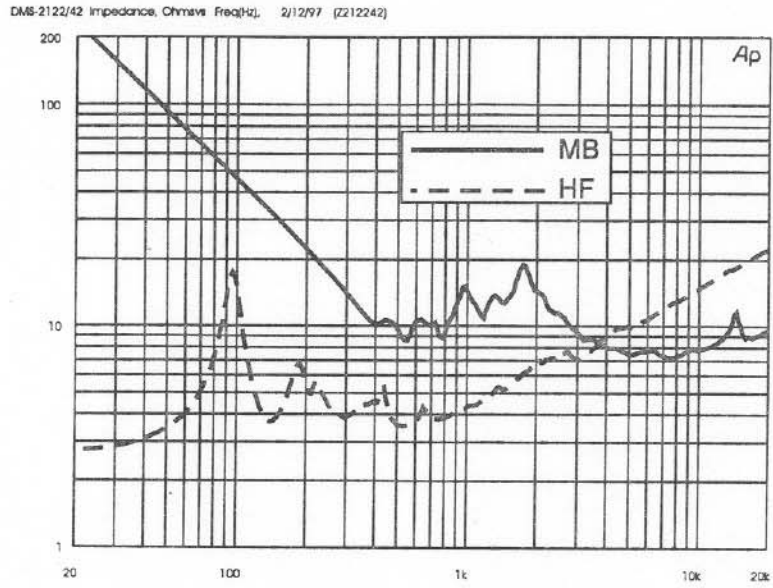


Figure 7—Wiring Diagram

The wiring diagram of each frequency band of the system is shown.

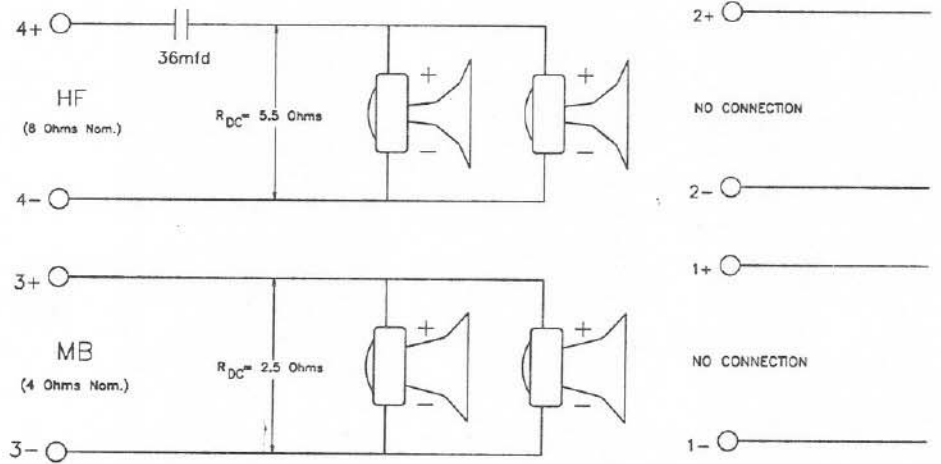
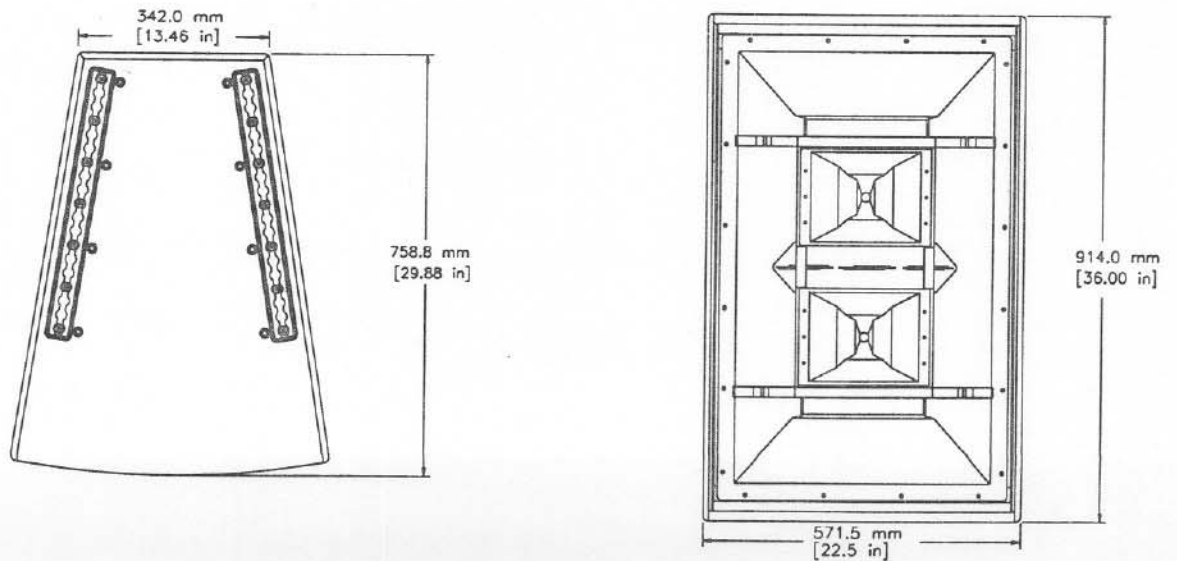


Figure 8—Dimensions



DeltaMax™ DMS-2122/42 Loudspeaker System

Specifications:

Frequency Response (measured in far field, calculated to one meter on axis, swept sine wave, one watt into MB section -2.00 V at 500 Hz, anechoic environment; see Figure 2):

140-16,000 Hz

Crossover Frequency:

160 and 1,480 Hz

Efficiency,

MB/HF:

18/25%

Maximum Long-Term-Average Power-Handling Capacity (per ANSI/EIA RS-426-A 1980),

MB/HF:

600/120 watts

Maximum Long-Term-Average Midband Acoustic Output, MB/HF:

108/30 acoustic watts

Sensitivity (SPL at one meter, indicated input power, anechoic environment, average level),

MB/HF,

1/1 watt:

107.0/117.0 dB

600/120 watts:

135.0/138.0 dB

Beamwidth (angle included by 6-dB-down points on polar responses, indicated one-third-octave bands of pink noise; see Figures 1 and 3),

Horizontal, 800-16,000 Hz:

40° (+30°, -0°)

Vertical, 800-16,000 Hz:

20° (+13°, -4°)

Directivity Factor, $R_0(Q)$, 800-16,000 Hz Average (see Figure 4):

48.3 (+23.3, -24.5)

Directivity Index, D_1 , 800-16,000 Hz Average (see Figure 4):

16.8 dB (+1.7 dB, -3.1 dB)

Distortion (115 dB SPL at one meter, shaped spectrum; see Figure 5),

Second Harmonic,

500 Hz:

0.2%

2,000 Hz:

1.1%

5,000 Hz:

0.7%

Third Harmonic,

500 Hz:

0.3%

2,000 Hz:

0.1%

5,000 Hz:

<0.1%

Transducer Complement,

HF:

ND4-16 drivers, HP-type 40° x 20° horns

MB:

Two DL-type 12-in. woofers, 40° x 20° horn

Impedance (see Figure 6),

Nominal,

MB/HF:

4/8 ohms

Minimum,

MB/HF:

3.5/7.2 ohms

Input Connections:

Two Neutrik NL8MPR Speakon® connectors paralleled

Recommended Amplifier Power,

HF:

250-500 watts

MB:

600-1,200 watts

Enclosure Construction,

Enclosure Shell:

18 mm, 13-ply birch plywood

Finish:

Black textured paint

Grille:

Vinyl-coated steel with foam

Rigging (DMS-2122/42PF only):

Two-point heavy-duty L-track system, accepts New Haven NH32102-2 double-stud fittings, or New Haven NH8192-2S or Ancra 42546-10 single-stud fittings with safety pins

Dimensions,

Height:

914 mm (36.00 in.)

Width (front):

572 mm (22.50 in.)

Width (back):

342 mm (13.46 in.)

Depth:

759 mm (29.88 in.)

Angle:

18° wedge

Net Weight:

84.4 kg (186 lb)

Shipping Weight:

88.5 kg (195 lb)

Electro-Voice®

600 Cecil Street, Buchanan, MI 49107

616/695-6831, 616/695-1304 Fax

SPEAKERS—MT and DeltaMax™

Part Number 533934—9648