

## DMS-1122/85 Series

### DeltaMax™ Two-Way, Full-Range, Electronically Controlled Sound-Reinforcement System

- New 12-inch woofer design provides improved internal damping of cone
- New DH2T compression driver
- Substantially improved vocal range performance
- New full-track flying hardware with top/bottom strapping
- New HF horn (80° x 55°)

#### Description

The Electro-Voice DMS-1122/85 full-range loudspeaker system is part of the DeltaMax™ series and is intended for high-level sound reinforcement in fixed-installation and touring-sound applications. The DMS-1122/85 is a two-way biamped loudspeaker system designed to be used with the dedicated DMC-1122X analog electronic controller. The DMS-1122/85 may also be used with appropriate factory presets with the Electro-Voice Dx34 digital crossover. In addition to providing conventional frequency division, time delay and equalization, DMC-1122X offers unique speaker protection circuitry to provide excellent reliability. This loudspeaker system and the associated electronic controllers were designed as an integral package to achieve maximum acoustic output with optimal sonic quality. The DMS-1122/85 is available in the following models: DMS-1122/85P which is a non-flying black painted version; DMS-1122/85PF which is equipped with rigging track flying hardware and is also painted black.

The DMS-1122/85 employs a custom-designed, 12-inch woofer for low-frequency reproduction. Designed specifically for the DeltaMax™ application, this woofer uses a

new cone material to provide maximum internal damping. This woofer also employs "DL" technology which utilizes a Thermal Inductive Ring, (TIR™), a non-magnetic pole piece extension that controls inductance and, most importantly, provides a major heat transfer path from the top of the voice coil to minimize power compression. For high frequencies, the DMS-1122/85 uses the DH2T, a design which features a one-piece titanium dome and suspension with integral stiffening ribs to provide extremely high output and substantially reduce distortion through the critical vocal frequencies. The compression driver is coupled to an 80° x 55° molded high-frequency horn. This flat-front constant-directivity high-frequency horn is based on the Electro-Voice HP series and is geometrically optimized from 1,200 to 20,000 Hz.

The DMS-1122/85 is constructed of 18-mm 13-ply birch plywood and is available in wear-resistant black, textured paint finish (DMS-1122/85P). The system is trapezoidal in shape, forming a 30° wedge, and includes a protective steel grille sandwich. This grille sandwich consists of two layers of vinyl-clad perforated metal with a water-resistant charcoal-gray foam interlining. The optional flying version includes two sections

of full tracks on the top and bottom to facilitate hanging of multi-cabinet arrays or permanent installations (DMS-1122/85PF). In addition, the DMS-1122/85 series has a built-in stand adapter for mounting the loudspeaker on 1.375-inch-diameter pole stand (such as the Electro-Voice Model 100BK).

#### Applications

The DMS-1122/85 loudspeaker system is ideal for any professional touring or installation application requiring accurate, high-level sound reinforcement. Because of the unique performance capabilities featured in this system, the DeltaMax™ DMS-1122/85 offers extremely wide-range music reproduction as well as accurate vocal coverage and maximized intelligibility.

The DMS-1122/85 and associated controller combinations are recommended for applications requiring full bandwidth down to 60 Hz. Where very high levels of deep bass are required, maximum performance may be achieved with the addition of the DMS-2181 (double 18-inch subwoofer) or DMS-1181 (single 18-inch subwoofer). Both of these subwoofer systems feature the EVX-180A 18-inch woofer and are designed to be used with associated controllers (see data sheets on DMS-2181 or DMS-1181).

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### 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-1122/85 systems are rated per ANSI/EIA RS-426-A 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 Dx34 digital electronic unit was used to provide the necessary crossover filters and equalization during power testing. Specifically, the DMS-1122/85 passes the ANSI/EIA RS-426-A power test with the following test parameters:

#### Low-Frequency Section:

$P_{EIMAXI}$ :	300 watts
Test Voltages:	47.0 volts rms 94.0 volts peak
$R_{SR}(1.15 R_E)$ :	7.36 ohms

#### High-Frequency Section:

$P_{EIMAXI}$ :	60 watts
Test Voltages:	17.6 volts rms 35.2 volts peak
$R_{SR}(1.15 R_E)$ :	5.18 ohms

### Crossover, Equalization and Time-Delay Controller

The DMS-1122/85 speaker system (and variants) is designed as an integrated package that utilizes any of the following controllers; DMC-1122X, or Electro-Voice Dx34 digital crossover system. Optimal performance of the DMS-1122/85 speaker system can only be assured when using the above-referenced controllers.

All controllers used with the DMS-1122/85 feature a 1,480-Hz crossover frequency utilizing 24-dB-per-octave Linkwitz-Riley filters. All contain fixed time-delay and equalization for optimum performance of the DMS-1122/85. Protection circuitry in the DMC-1122X controller also ensures maxi-

imum reliability and functionality.

### Electrical Connection and System Wiring

Electrical connections to the DMS-1122/85 are made on the back of the enclosure via a 4-pin connector. There are two connectors on the input panel to allow paralleling of other DMS-1122/85 systems. The Neutrik Speakon®NL4MPR is used for both connections. The pin assignments are as follows:

- Pin 1+: LF(+)
- Pin 1-: LF(-)
- Pin 2+: HF(+)
- Pin 2-: HF(-)

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

### Amplifier Requirements

Power amplifiers with the following ratings are recommended for use with the DMS-1122/85 speaker systems:

LF: 300-600 watts continuous into 8 ohms.

HF: 125-250 watts continuous into 8 ohms.

DMS-1122/85 speakers may be paralleled only with other DMS-1122/85 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 are possible in the system. Under certain circumstances, higher rated amplifiers are acceptable. It is acceptable to drive the DMS-1122/85 speakers with a stereo power amp utilizing one channel to drive the low frequencies and the other channel to drive the high frequencies. See owner's manuals on various controllers for appropriate settings.

### 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-1152/64PF is the version of the DMS-1152/64 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) when used with the New Haven NH8192-2S or Ancra 42546-10 single-stud fittings with locking pins. The working-load (for an 8:1 safety factor) limit for the overall enclosure is 340 kg (750 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. Electro-Voice offers a line of flying-hardware accessories for use with the DMS loudspeaker systems. 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.

## DeltaMax™ DMS-1122/85 Loudspeaker System

### Field Replacement

The DMS-1122/85 was designed for expedient field service. Removing the woofer bolts allows the woofer to be easily removed. Removing the horn-mounting screws allows access to the compression driver, both through the horn and woofer baffle cutouts. A woofer failure will require replacement of the entire driver. In the case of a compression driver failure, a diaphragm assembly replacement kit with instructions is available. If desired, the complete driver may be returned for service.

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

LF: Complete woofer: EV Part No. 812-2775

HF: Diaphragm kit: EV Part No. 81161-XX

### Architects' And Engineers' Specifications

The loudspeaker speaker system shall be a two-way biamped system with performance controlled by a variety of dedicated electronic control units. The loudspeaker system shall have a 305-mm (12-inch) direct-radiating driver with an 8-ohm, 63.5-mm (2.5-inch) voice coil constructed of aluminum wire, and shall be capable of a 300-watt shaped pink-noise signal with a 6-dB crest factor for 8 hours (as per ANSI/EIA RS-426-A 1980). The loudspeaker system shall have a 25.4-mm (1.0-inch) exit compression driver mounted on a high-frequency horn. The compression driver shall have 50.8-mm (2.0-inch) diameter, .001-inch thick titanium dome and an 8-ohm nominal, 50.8-mm (2.0-inch) diameter voice coil constructed of aluminum wire, and which shall be capable of handling a 60-watt, 1,480- to 20,000-Hz pink-noise signal with a 6-dB crest factor for 8 hours (as per ANSI/EIA RS-426-A 1980 standard). The high-frequency horn shall be of the constant-directivity type and fully rotatable and shall produce a nominal horizontal beamwidth (6-dB-down angle) of 80° from 2,000 to 20,000 Hz and a nominal vertical beamwidth of 55° from 1,600 to 20,000 Hz. The loudspeaker system enclosure shall be constructed of 18-mm thick, 13-ply birch plywood, trapezoidal in shape, forming a 30° wedge, and

shall have a vinyl clad steel grille system. The DMS-1122/85 system shall be used with recommended control systems and shall have a two-way crossover circuit with fourth-order Linkwitz-Riley filters, equalization, time delay and protection circuitry. When used with the electronic control unit, the loudspeaker system shall have a flat on-axis frequency response from 50 to 16,000 Hz. The loudspeaker enclosure dimensions shall be 589 mm (23.0 in.) high, 375 mm (14.75 in.) wide (front), 356 mm (14.0 in.) wide (back) and 356 mm (14.0 in.) deep and shall weigh 26.8 kg (59 lb). The system shall incorporate a two-point rigging system that will accept New Haven NH32101-2 double-stud ring fittings and the New Haven NH8192-2S and Ancra 42456-10 single-stud fittings. The loudspeaker shall be Electro-Voice DMS-1122/85 (and its variants).

### 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 Mark IV Audio Service or any of its authorized service representatives. Obtaining Warranty Service: To obtain warranty service, a customer must deliver the product, prepaid, to Mark IV 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 Mark IV 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, call: 800/234-6831. Specifications subject to change without notice.

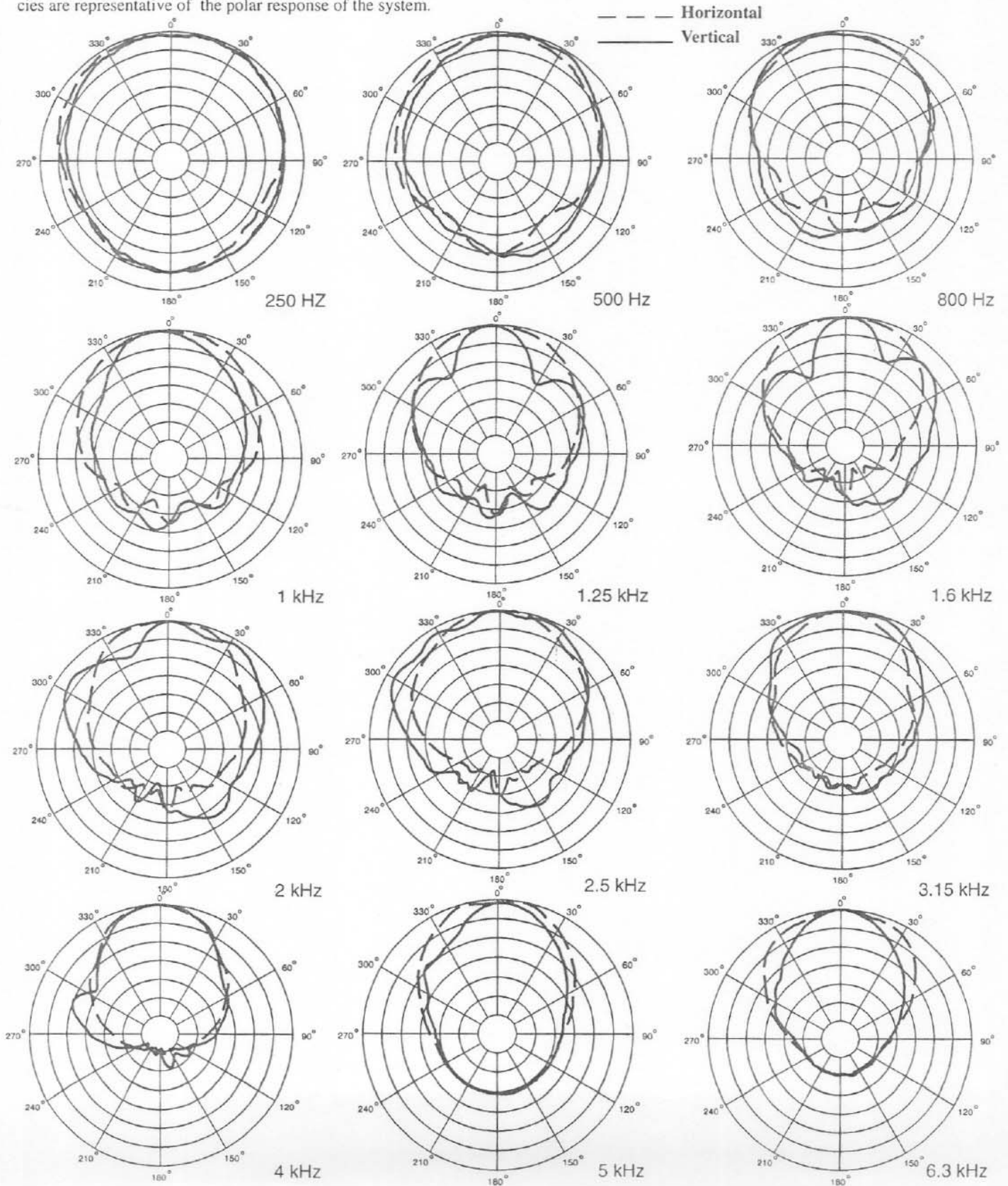


# DeltaMax™ DMS-1122/85 Loudspeaker System

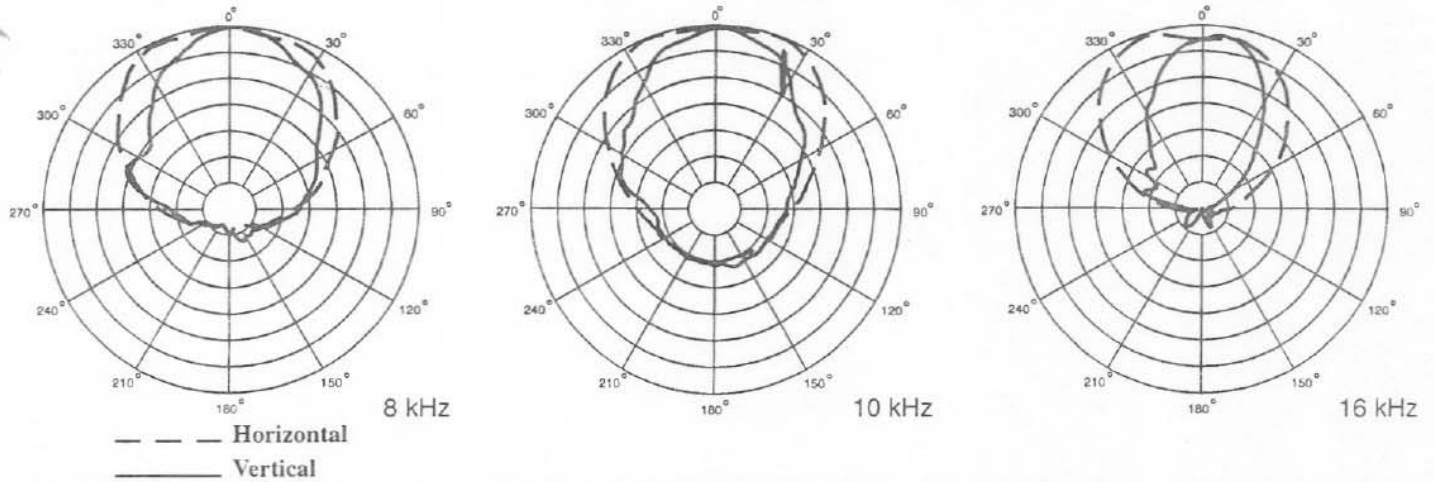
**Figure 1— Polar Response**

The directional response of the system was measured in an anechoic environment at a distance of 6.1 m (22 feet) using 1/3-octave-filtered pink noise with a full spherical measurement system. The Dx34 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-1122/85 Loudspeaker System

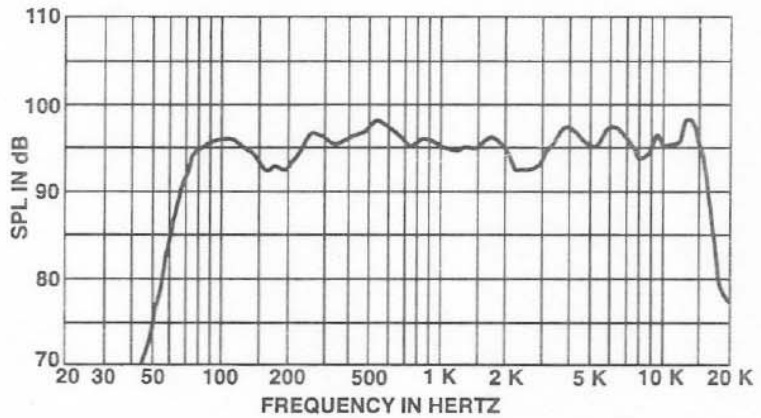


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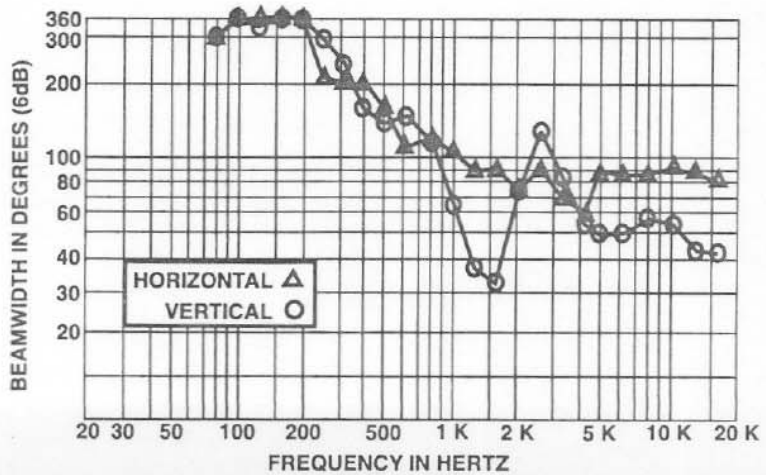
**Figure 2— Frequency Response**

The frequency response of the system was measured on axis in the farfield in an anechoic environment using a swept sine-wave signal. The Dx34 digital electronic unit was used to provide the necessary crossover filters, equalization and time delay. One watt of power (2.83 volts rms at 250 Hz) was applied to the midband of the low-frequency section. The sound-pressure level was normalized for an equivalent one meter distance.



**Figure 3— Beamwidth**

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

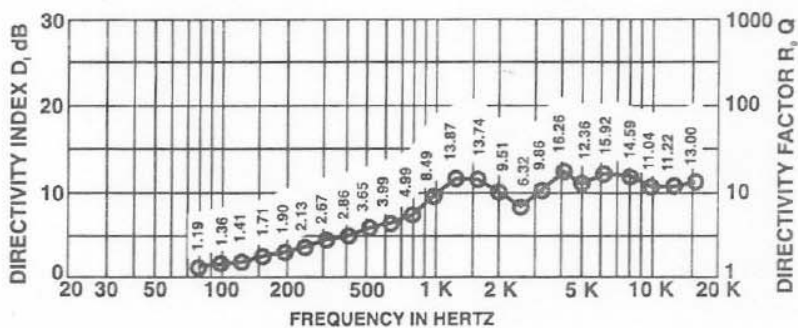


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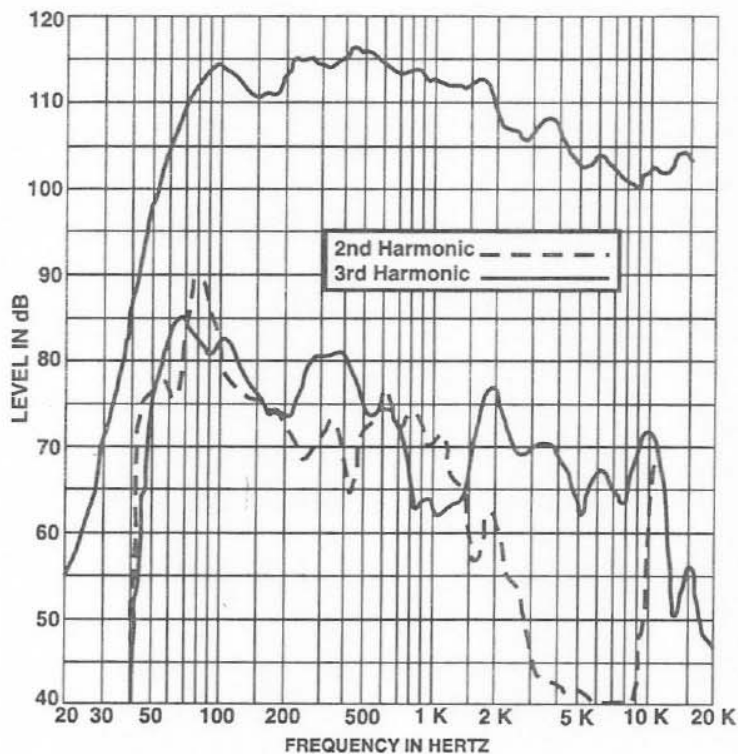
**Figure 4— Directivity**

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



**Figure 5— Distortion**

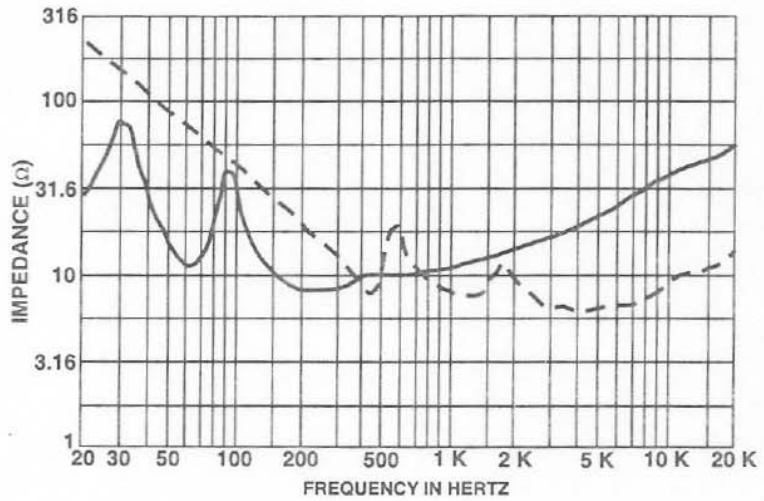
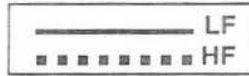
Distortion for the system was measured on axis in the farfield in an anechoic environment with an input signal that would result in a sound-pressure level of 115 dB at one meter. The Dx34 digital electronic unit was used to provide the necessary crossover filters, equalization and time delay. A frequency 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-1122/85 Loudspeaker System

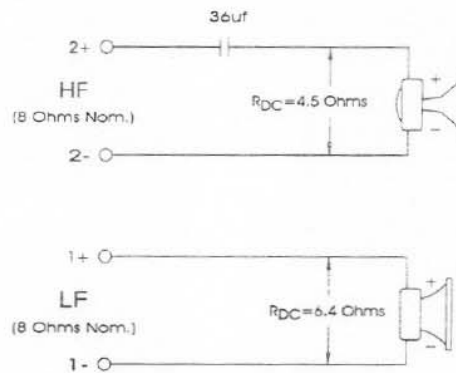
**Figure 6— Impedance**

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

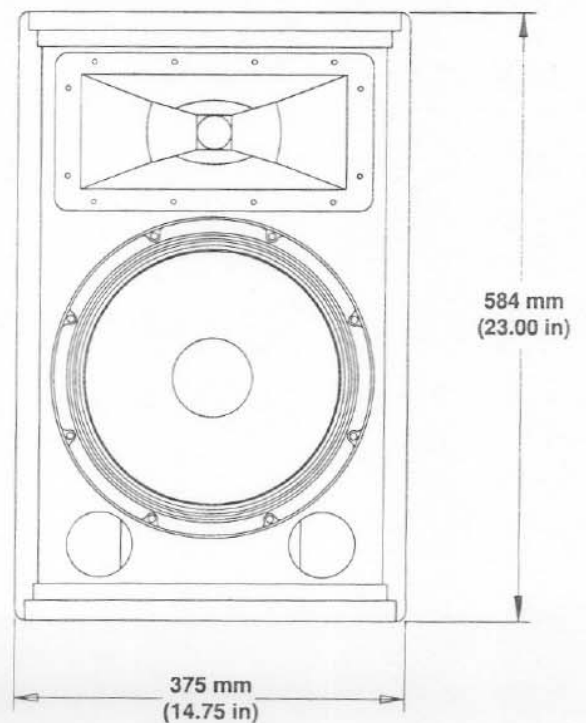
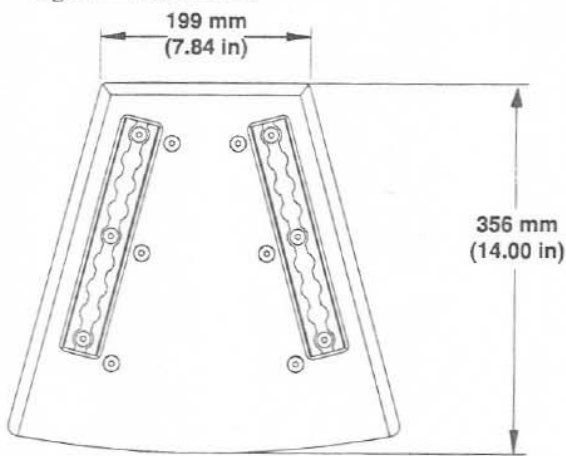


**Figure 7— Wiring Diagram**

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



**Figure — Dimensions**



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## Specifications

**Frequency Response** (measured in far field, calculated to one meter on axis, swept sine wave, one watt into LF section - 2.83 V at 250 Hz, anechoic environment; see Figure 2):  
60-16,000 Hz

**Crossover Frequency:**

1,480 Hz

**Efficiency, LF/HF:**

4.8/25 %

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

300/60 watts

**Maximum Long-Term-Average**

**Midband Acoustic Output, LF/HF:**

14/15 acoustic watts

**Sensitivity (SPL at one meter, indicated input power, anechoic environment, average level), LF/HF,**

1/1 watt:

99.0/110.0 dB

300/60 watts:

124.0/128.0 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, 1,200-16,000 Hz:**

80° (+15°, -30°)

**Vertical, 1,200-16,000 Hz:**

55° (+70°, -20°)

**Directivity Factor,  $R_0$  (Q), 1,200-16,000 Hz Average** (see Figure 4):

12.3 (+4.0, -6.0)

**Directivity Index, D, 1,200-16,000 Hz Average** (see Figure 4):

10.9 dB (+1.2 dB, -2.9 dB)

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

**Second Harmonic,**

**100 Hz:**

2.4 %

**500 Hz:**

0.7 %

**2,000 Hz:**

2.1 %

**5,000 Hz:**

1.0 %

**Third Harmonic,**

**100 Hz:**

2.4 %

**500 Hz:**

0.7 %

**2,000 Hz:**

0.3 %

**5,000 Hz:**

0.1 %

**Transducer Complement,**

**HF:**

DH2T driver, HP-type 80°x55° horn

**LF:**

DL-type 12-in. woofer

**Impedance** (see Figure 6),

**Nominal, LF/HF:**

8/8 ohms

**Minimum, LF/HF:**

8.6/6.6 ohms

**Input Connections:**

Two Neutrik NL4MPR Speakon® connectors paralleled

**Recommended Amplifier Power,**

**HF:**

125-250 watts

**LF:**

300-600 watts

**Enclosure Construction,**

**Enclosure Shell:**

18 mm, 13-ply birch plywood

**Finish:**

Black textured paint

**Grille:**

Vinyl-coated steel with foam

**Rigging (DMS-1122/85PF 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:**

584 mm (23.00 in.)

**Width (front):**

375 mm (14.75 in.)

**Width (back):**

199 mm (7.84 in.)

**Depth:**

356 mm (14.00 in.)

**Angle:**

30° wedge

**Net Weight:**

26.8 kg (59 lb)

**Shipping Weight:**

29.0 kg (64 lb)

# Electro-Voice®

a MARK IV company

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SPEAKERS—MT and DeltaMax™

Part Number 533478—9630