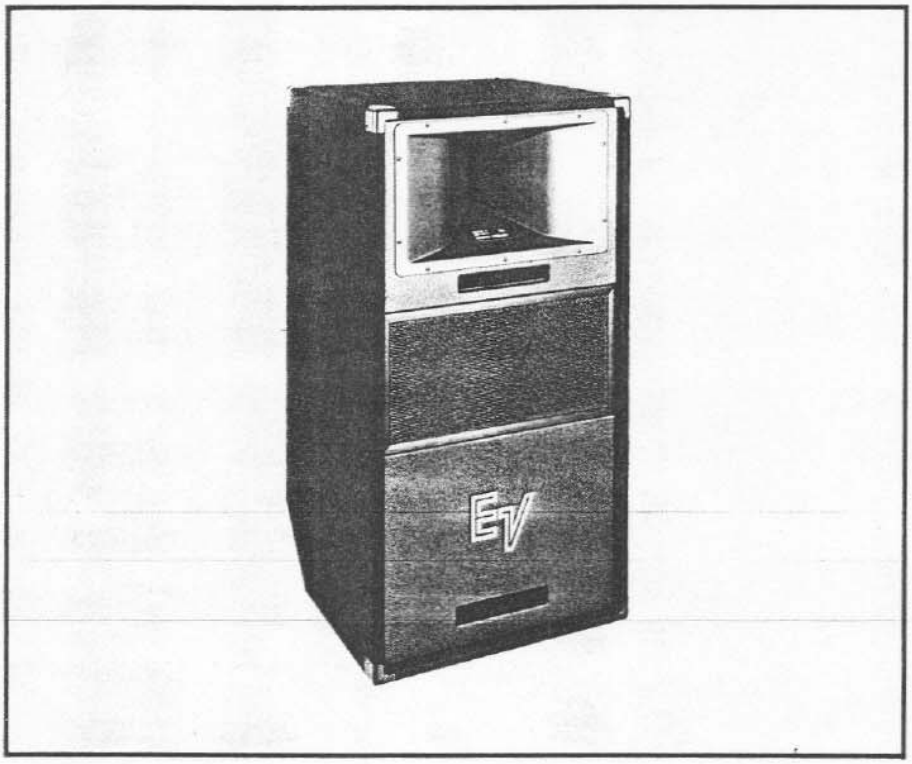

Electro-Voice®
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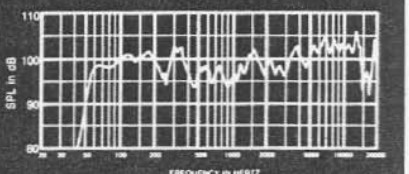

FIGURE 1
MTS-1 Axial Frequency Response
1 Watt/1 Meter

Model MTS-1
Manifold Technology® Two-Way Full-Range Stage Speaker System

SPECIFICATIONS

Frequency Response, 10 Feet on Axis, Swept 1/3-Octave, Half-Space Anechoic Environment (see Figure 1):
53-20,000 Hz

Low-Frequency 3 dB Down Point:
53 Hz

Usable Low-Frequency Limit (10 dB down point):
47 Hz

Efficiency, LF/HF:
5.0/25%

Long-Term Average Power Handling Capacity per EIA Standard RS-426A (see Power Handling section), LF/HF:
600/150 watts

Maximum Long-Term Midband Acoustic Output, LF/HF:
30.0/37.0 watts

Sound Pressure Level at One Meter, One Watt Input, Anechoic Environment, Band-Limited Pink-Noise Signal, LF/HF:
99/110 dB

Dispersion Angle Included by 6 dB Down Points on Polar Responses, Indicated 1/3-Octave Bands of Pink Noise,
600-18,000 Hz Horizontal (see Figure 3):
90° (+15°, −15°)
1,250-18,000 Hz Vertical (see Figure 3):
40° (+25°, −5°)

Directivity Factor R_θ (Q) 500-20,000 Hz Median (see Figure 4):
10.7 (+11.2, −8.7)

Directivity Index D_I, 500-20,000 Hz Median (see Figure 4):
10.3 (+2.7, −7.2)

Distortion, 0.1 Full Power Input,
Second Harmonic,
100 Hz: 2%
1,000 Hz: 5.5%
10,000 Hz: 10.0%
Third Harmonic,
100 Hz: <½%
1,000 Hz: <½%
10,000 Hz: 2%

Distortion, 0.01 Full Power Input,
Second Harmonic,
100 Hz: <1%
1,000 Hz: 2%
10,000 Hz: 3.5%
Third Harmonic,
100 Hz: <½%
1,000 Hz: <½%
10,000 Hz: <½%

Transducer Complement,
High-Frequency:
Two DH1A variant compression drivers
MTA-22 high-frequency summation device
HP940 90° × 40° horn
Low-Frequency:
Two DL15X's

Box Tuning Frequency:
55 Hz

Crossover Frequency:
800 Hz

Crossover Slope:
24 dB per octave minimum

Impedance,
Nominal LF/HF:
4 ohms/8 ohms

Impedance,
Minimum LF/HF:
3.1 ohms/5.6 ohms

Recommended Amplifier Power (see Amplifier Requirements Section),
HF:
150-300 watts
LF:
500-1,000 watts

Input Connections:
Parallel Neutrik Speakon™ NL4MPR
Use Neutrik Speakon™ NL4FC for cable (included)

Enclosure Materials and Colors:
Black carpet-covered 3/4-inch void-free plywood; perforated black metal grille

Enclosure Dimensions,
Height: 122.0 cm (48.0 in.)
Width: 63.5 cm (25.0 in.)
Depth: 60.5 cm (23.8 in.)

Shipping Dimensions,
Height: 128.3 cm (50.5 in.)
Width: 70.0 cm (27.5 in.)
Depth: 67.0 cm (26.3 in.)

Net Weight:
82.7 kg (182 lb)

Shipping Weight:
84.5 kg (186 lb)

DESCRIPTION

The Electro-Voice MTS-1 is inspired by the MT-4 Manifold Technology® Concert System. It delivers extremely high acoustic output from a very compact portable box.

The MTS-1 is a manifolded, two-way, bi-amped, full-range main speaker system. Two drivers are manifolded in each of the two frequency ranges. The system is intended to be used in permanent and mobile applications where full advantage can be taken of its wide coverage, high-output and compact dimensions.

The lower frequencies (50-800 Hz) are reproduced by two DL15MTs. The close orientation of the devices and the vented-box design allow for increased low-frequency

efficiency and reduced distortion, when compared with conventional direct-radiating designs of comparable size. The compound manifold chamber extends the usable frequency range by controlling the natural band-pass characteristics of existing manifold designs. The Manifold Absorber's position, shape and acoustic properties contribute towards this control.

The higher frequencies (800-20,000 Hz) are reproduced by two modified DH1A compression drivers, manifolded on the MTA-22 (U.S. Patent No. 4,629,029) and mounted to a special HP940 90° x 40°constant-directivity horn. The HP series horn (U.S. Patent No. 4,685,532) features integral fiberglass-and-zinc construction for exceptional strength. Also featured are beamwidth control vanes — special waveguides in the horn throat — that correct the very-high frequency dispersion anomalies normally associated with other 2-inch-throat horns.

APPLICATIONS

The MTS-1 is ideal for situations where accurate high output and wide coverage is needed from a full-range compact system, such as a band playing different sized venues or for audio visual presentations. The wide coverage angle means that an individual MTS-1 can replace two or more conventional loudspeaker cabinets with no loss of audience coverage. The system is most suited for medium-throw applications.

BI-AMPING

Because of its exceptional power handling, the MTS-1 must be bi-amped. An active crossover with a crossover frequency of 800 Hz and a slope of at least ***24-dB-per-octave*** is required.

TRI-AMPING

In larger venues it may be necessary to augment the low frequencies with subwoofers (such as the SH-1810L-ER). A crossover in the region of 160 Hz with a slope of at least 12-dB-per-octave is recommended.

HORN COMPENSATION

High efficiency constant-directivity horn-driver combinations all exhibit power response rolloff at high frequencies. This can be equalized in the MTS-1 in two ways:

1. **High Level:**
   The MTS-1 has switchable "Horn Compensation" built in. With the horn compensation switch (located on the input panel) set to "Out," no equalization is present.

   With the switch set to "In," broad-band HF equalization is inserted into the circuit to produce a flat response.

2. **Low Level:**
   a. An Electro-Voice crossover (for example, the XEQ-3 and XEQ-2) with horn equalization module EQR. The "Horn Compensation Switch" should be set to "Out".
   b. A one-third-octave equalizer (see Figure 5). Combinations of the above methods are also possible.

CONNECTIONS

The MTS-1 is equipped with Neutrik Speakon™ NL4MPR connectors. Two connectors are installed in parallel allowing additional MTS-1s to be installed. One mating Neutrik Speakon™ connector NL4FC is supplied with each system. These connectors are locking, self-polarizing and capable of 30 amps rms continuously. Additional connectors and cables can be purchased from your dealer.

If you experience any difficulty in obtaining cables, connectors or wiring accessories the following companies can be contacted.

Neutrik USA, Inc.
1600 Malone Street
Millville, NJ 08332

Pro Co Sound, Inc.
135 E. Kalamazoo Ave.
Kalamazoo, MI 49007

Whirlwind Music Distributors, Inc.
P.O. Box 1075
Rochester, NY 14603

The pin arrangements are:

1 – = LF (–)
1 + = LF (+)
2 – = HF (–)
2 + = HF (+)

The low-frequency drivers are connected directly to inputs and present a nominal 4-ohm load. The high-frequency drivers have low-frequency protection capacitors in series and present a nominal 8-ohm load.

RECOMMENDED POWER AMPLIFIERS

The MTS-1 is a very efficient loudspeaker system. This means less amplifier power is needed to achieve a given sound output level. It is also capable of withstanding large amounts of input power and translating it efficiently into large amounts of acoustic output. Each system requires two amplifier channels. 1,000-watt rms into 4 ohms rating is recommended for the low-frequency amplifier. 300-watts rms into 8 ohms is recommended for the high-frequency amplifier.

Smaller and larger amplifiers can be used but optimum performanced can be achieved with the above.

MULTIPLE USE

It is possible to parallel more than one MTS-1 cabinet using the two Neutrik Speakon connectors on the input panel. Care should be taken when doing this. Connecting too low an impedance to amplifiers can damage them (see amplifier specifications). It should be noted that it is possible to parallel either of the two frequency bands independently of the other. For example, two high-frequency sections could be connected in parallel while driving their low-frequency sections independently.

ENCLOSURE CONSTRUCTION

The MTS-1 is constructed to be a portable speaker system. It is ruggedly constructed of ¾-inch void-free plywood. Joints are dado cut for superior strength. The cabinet is finished with a densely-woven, abuse-resistant black carpet that is both attractive and highly durable. An acoustically transparent metal grille protects the manifold chamber and drivers. The system can be transported by one person tilting the cabinet back onto the heavy-duty metal wheels. Recessed handles are positioned to facilitate this. The enclosure is completed with metal corners and firmly secured rubber feet.

FREQUENCY RESPONSE

The two frequency sections of the MTS-1 are significantly different in sensitivities. To produce a response similar to Figure 1, it is necessary to correct for absolute levels after the horn compensation has been completed. This can be done at any stage in the system but it is recommended that it be done at the power amplifiers to minimize any noise in the system. In some circumstances, some up to 12 dB of attenuation may be required on the HF section.

DIRECTIVITY

The polar responses of the MTS-1 are shown in Figure 2 at selected ⅓-octave bands. The polars were measured in EV's large anechoic chamber using ⅓-octave pink noise. The frequencies selected are fully representative of the polar response of the system. Beamwidth of the system at the complete ⅓-octave bands is shown in Figure 3. R_θ (Q) and the directivity index D_i are plotted in Figure 4.

POWER HANDLING CAPACITY

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 the 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.

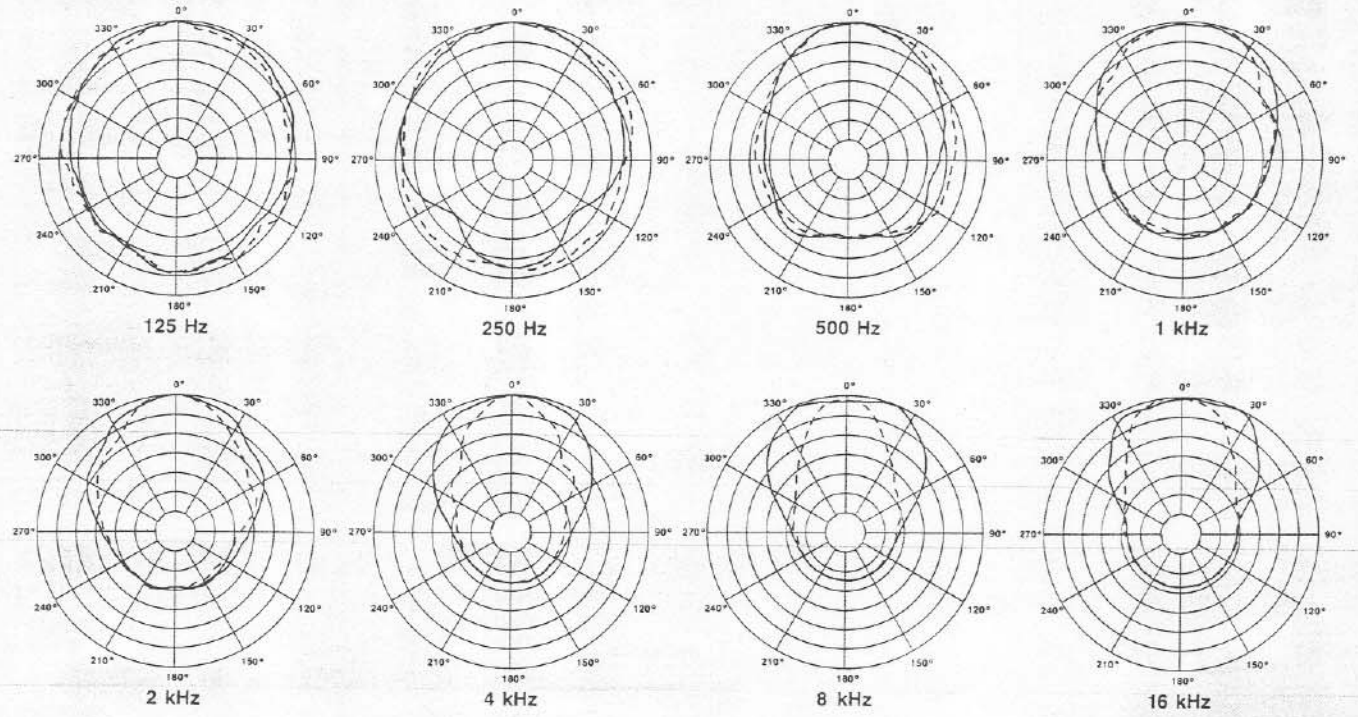

FIGURE 2 — Polar Response

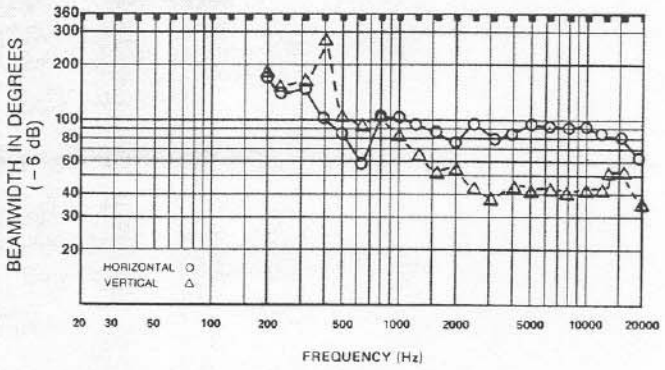

FIGURE 3
Beamwidth vs. Frequency

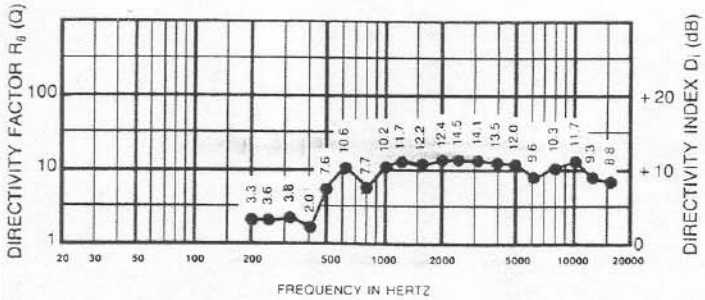

FIGURE 4
Directivity Factor R_θ (Q) and Directivity Index (D_i) vs. Frequency

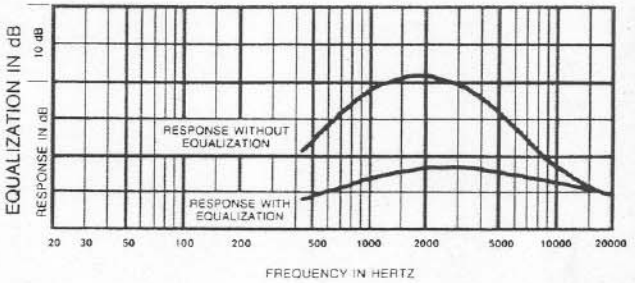

FIGURE 5
Approximate Horn Equalization

Specifically, the MTS-1 is designed to withstand the power test described in the revised EIA Standard RS-426A. The EIA test spectrum is applied for eight hours. To obtain the spectrum, the output of a white-noise generator (white noise is a particular type of random noise with equal energy per bandwidth in Hz) is fed to a shaping filter with 6-dB-per-octave slopes below 40 Hz and above 318 Hz. When measured with the usual constant-percentage bandwidth analyzer (one-third-octave), this shaping filter produces a spectrum whose 3-dB-down points are at 100 Hz and 1200 Hz with a 3-dB-per-octave slope above 1200 Hz. The MTS-1 is a bi-amp system so the power handling of each frequency section is treated independently. The low-frequency section is fed with the spectrum through an amplifier with the continuous power set at 600 watts into 3.2 ohms EIA equivalent impedance, (43.9 volts true rms). A 32-Hz high-pass filter was present to minimize excursion outside the pass-band. The high-frequency is fed with the same spectrum through an 800-Hz 24-dB-per-octave high-pass filter into an amplifier with the continuous power set at 150 watts into 5.6 ohms EIA equivalent impedance, (29.1 volts true rms). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 2400-watt peaks (87.6-volts peak) into the low-end and 600-watt peaks (58.0-volts peak) into the high-end. This procedure provides a rigorous test of both thermal and mechanical failure modes.

SUBPASSBAND SPEAKER PROTECTION

Below the enclosure tuning frequency (50 Hz), cone excursion increases rapidly with little acoustic output. It is therefore highly recommended that a high-pass filter be used. A 32-Hz 12-dB-per-octave is sufficient but any frequency up to 40 Hz can be used.

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); 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
MANUFACTURING PLANTS AT ■ BUCHANAN, MI ■ NEWPORT, TN ■ SEVIERVILLE, TN ■ GANANOQUE, ONT.

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