

## MTL-1X

### Double 18-inch SubScoop™ Low-Frequency Speaker System

- Subwoofer for augmenting the low-frequency performance of the MTH-1 mid/high module, and other stage systems
- Two EVX-180B woofers for reliable, extended low-frequency output
- 1,200-watt long-term power capacity
- Horn loading provides increased throw
- Rugged, road-ready cabinet; metal grille; black carpet finish
- Neutrik Speakon® inputs
- Rear casters for improved portability

---

#### Description

The Electro-Voice MTL-1X is a 1,200-watt subwoofer loudspeaker system which combines the attributes of both horn-loaded and vented box designs. The MTL-1X design utilizes the unique double SubScoop™ cabinet construction with two EVX-180B woofers, as used in X-Array™ concert systems. The design behaves like a horn over much of its range, but without the time delay and weight problems usually associated with conventional designs. Vented-box principles take over for the lowest octave and assist in producing exceptionally high levels of clean, punchy bass from a modest-sized box. The reverse woofer orientation has been used to optimize the rear chamber volume and decrease the horn flare rate for extended low-end performance.

When used with the MTH-1 mid/high module, the MTL-1X provides high-output sound reinforcement for clubs, large halls, or outdoor events in a compact package which can be moved easily by a two-person crew.

Although the MTL-1X was designed for use with the MTH-1 system, it may be used to augment the bass performance of any Electro-Voice stage system.

---

#### Use in Multiples

The MTL-1X may be used in multiples to increase acoustic output. When two speaker systems are placed side by side, the woofer cones “mutually couple,” causing the two systems to act as one system with twice the effective cone area at very-low frequencies, giving an additional 3-dB increase in maximum acoustic output.

Mutual coupling will occur when the frequency is such that the center-to-center distance between the two woofer manifolds is less than about one-half wavelength.

---

#### Crossover

To optimize performance, the MTL-1X should be used in conjunction with an active crossover with a minimum slope of 12-dB per octave and a crossover frequency in the range of 100 Hz to 160 Hz. Due to the high efficiency of the MTL-1X, less amplifier input is needed to achieve a given sound output level.

---

#### Amplifier Power Recommendations

As noted in the Power-Handling Capacity section, above, the MTL-1X has a random-noise power capacity of 1,200-watts long

term (4,800 watts peak) per EIA RS-426-A 1980. The following guidelines will help relate this to an appropriate power amplifier output rating.

1. To use the MTL-1X to full capacity, skilled experts in sound system installation and operation will obtain the best results if the power amplifier is 2.0 to 4.0 times the long-term average noise power rating of the speaker system. For the MTL-1X, this is 1,200 to 4,800 watts.

**The caution cannot be made strongly enough, however, that this arrangement is only for experts or those who can discipline themselves against “pushing” the system for ever-higher sound levels and who can avoid “accidents” such as catastrophic feedback or dropped microphones.**

2. A more conservative, “normal” amplifier size, which will produce audible results nearly equal to those of the “expert” recommendation, is 1.0 to 1.4 times the long-term average noise power rating of the speaker. For the MTL-1X, this is 1,200 to 1,680 watts.
3. To be very conservative, one can use an amplifier rated at 0.5 to 0.7 times the

# MTL-1X Double 18-inch SubScoop™ Low-Frequency Speaker System

long-term average noise power rating of the loudspeaker. For the MTL-1X, this is 600 to 840 watts.

Request P.A. Bible Addition No. Two (“Power- Handling Capacity”) for more background on these recommendations.

---

## Speaker Protection

---

When in the vented-box mode, the SubScoop™, like all other vented systems, experiences rapidly increasing cone excursion below the box-tuning frequency. The acoustic output is also decreasing rapidly; therefore, it is sensible to protect the MTL-1X and maximize the power output of the subwoofer by inserting an active 32-Hz high-pass filter with a slope of at least 12 dB per octave into the circuit. Such subpassband filters are found in many commercially available crossovers and equalizers including items manufactured by Electro-Voice.

---

## Frequency Response

---

The MTL-1X’s axial frequency response was measured in Electro-Voice’s large anechoic chamber at a distance of 3 meters (10 feet) with a swept sine-wave input. Figure 1 has been averaged and corrected for 1 watt at 1 meter.

---

## Enclosure Construction

---

Intended to be used as a portable speaker system, the MTL-1X is ruggedly constructed of 3/4-inch, void-free plywood. All joints are dado cut, and the cabinet is finished with a densely-woven, abuse-resistant carpet that is both attractive and highly durable. A full-length steel grille protects the woofer from damage. Large, heavy-duty metal corner protectors, firmly secured rubber feet, rugged casters, and recessed handles complete the picture, ensuring that the MTL-1X speaker system is ideally suited for a long and reliable life on the road.

---

## MTL-1X Connections

---

The MTL-1X is equipped with two parallel Neutrik Speakon® NL4MD-V connectors, selected for their ability to reliably deliver to the speaker components the high cur-

rents delivered by high-wattage power amplifiers. The NL4FC is a four-pin mating connector for the NL4MD-V, and Figure 4 shows how the usual two-conductor speaker cable should be wired to pins 1+ and 1– of the connector. Two typical connectors at the power amplifier end of the cable are shown: banana and 1/4-inch phone plugs. (The banana plug provides the more reliable connection.)

If it is desired to use the MTL-1X with one amplifier for each woofer, remove the input panel and follow the instructions. In this configuration, the upper woofer is fed through pins 1+ and 1–, and the lower woofer through pins 2+ and 2–.

To find your local Neutrik dealer, contact:

Neutrik USA, Inc.  
195-S3 Lehigh Ave.  
Lakewood, NJ 08701  
908/901-9488

---

## Service

---

In the unlikely event the MTL-1X requires service, the woofers can be replaced or serviced from the front. A service data sheet is available from Electro-Voice.

---

## Power-Handling Test

---

Electro-Voice components and systems are manufactured to exacting standards, ensuring they will hold up, not only through the most rigorous of power tests, but also through continued use in arduous, real-life conditions. The EIA Loudspeaker Power Rating Full Range (EIA RS-426-A 1980) uses a noise spectrum which mimics typical music and tests the thermal and mechanical capabilities of the components. Electro-Voice will support relevant additional standards as and when they become available. Extreme, in-house power tests, which push the performance boundaries of the woofers, are also performed and passed to ensure years of trouble-free service.

Specifically, the MTL-1X passes EIA RS-426-A 1980 with the following values:

$$R_{SR} = 3.45 (1.15 \times R_E)$$

$$P_{E(MAX)} = 1200 \text{ watts}$$

$$\text{Test voltage} = 64.3 \text{ volts rms,} \\ 128.6 \text{ volts peak}$$

The “peak” power-handling capacity of a woofer is determined by the peak test voltage amount. For the MTL-1X, a 128.6-volt peak test voltage translates into 4,800-watts short-term peak power-handling capacity. This is the equivalent of four times the “average” power-handling capacity, and is a peak that can be sustained for only a few milliseconds. However, this sort of short duration peak is very typical in speech and music. Provided the amplifier can reproduce the signal accurately, without clipping, the woofer will also perform accurately and reliably, even at these levels.

---

## Suspending MTL-1X Enclosures

---

The MTL-1X has been developed in conjunction with the HS series of hanging hardware. The HSMT-1 kit allows the MTL-1X to be hung safely in a variety of orientations. The combination of the HSMT-1 kit and the MTL-1X enclosure has been certified by an independent structural engineer to be safe and secure. Each HSMT-1 kit consists of a steel tube, two brackets, two eyebolts and the necessary fasteners. The installer must assemble the HSMT-1 kit by first drilling two holes into the MTL-1X enclosure, in pre-defined positions, and then screwing the brackets onto the steel tube, which passes through the enclosure. Full instructions are included with each HSMT-1 kit. A single MTL-1X requires two HSMT-1’s to suspend it horizontally. For hanging in multiples, two HSMT-1’s are still needed for hanging horizontally. A maximum of two cabinets can be suspended in this manner. It is not recommended to suspend multiples of the MTL-1X vertically. Vertical is defined by having the woofers oriented one above the other. *Full attention must be given to the instructions and limitations in the HSMT-1 kit instructions sheet.*

# MTL-1X Double 18-inch SubScoop™ Low-Frequency Speaker System

---

## Architects' and Engineers' Specifications

---

The loudspeaker shall be a horn-loaded type. The low frequencies shall be reproduced with two 600-watt (EIA RS-426-A 1980) EVX-180B 457-mm (18-in.) woofers. The system will reproduce the frequencies from 45 to 160 Hz. The system shall be capable of producing average sound levels in excess of 131 dB in the long term, and short-term peaks of 137 dB.

The enclosure shall be constructed of black, carpeted, multilayer plywood and have a metal grille which attaches with six screws. The dimensions shall be 1.16 m (45.8 in.) tall, 572 mm (22.5 in.) wide, and 758 mm (29.9 in.) deep. The system shall weigh 75.0 kg (165 lb). Neutrik Speakon® connections shall be provided.

The loudspeaker system shall be the Electro-Voice MTL-1X.

---

## 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 Electro-Voice Service or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice 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 Electro-Voice 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 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.

**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.

**For warranty repair** or service information, 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.

# MTL-1X Double 18-inch SubScoop™ Low-Frequency Speaker System

Figure 1—Axial Frequency Response

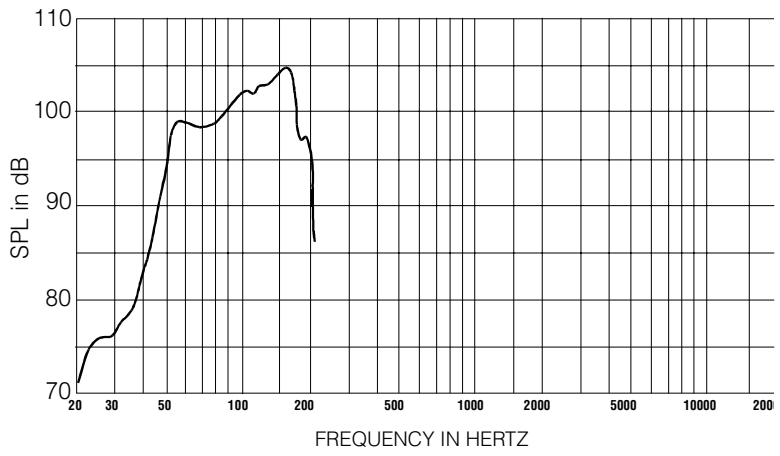
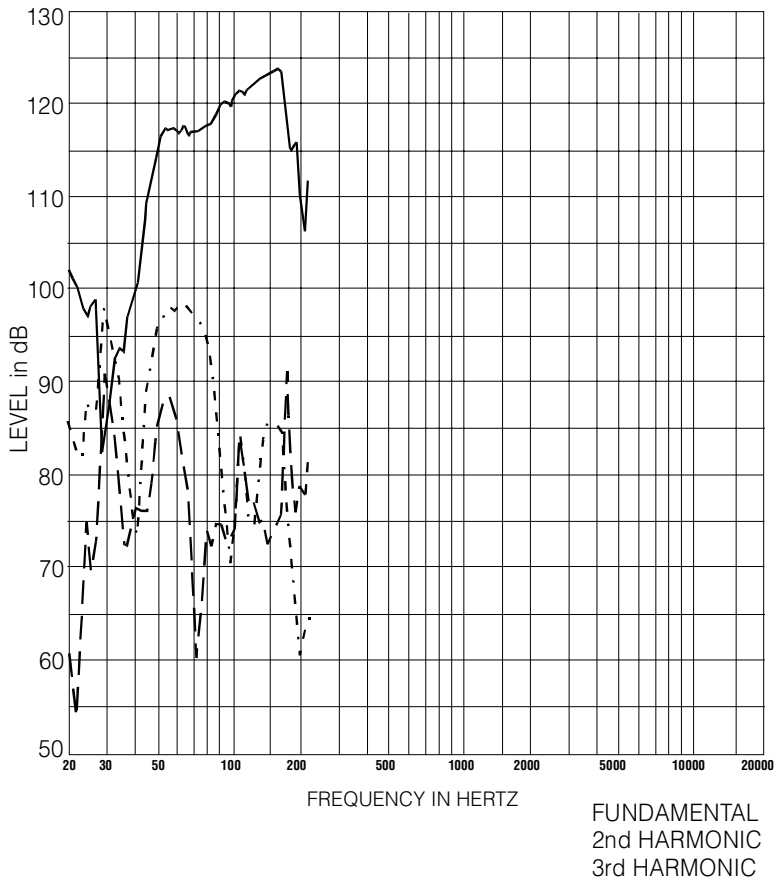


Figure 2—Harmonic Distortion 0.1  
Rated Power Input (120 watts)

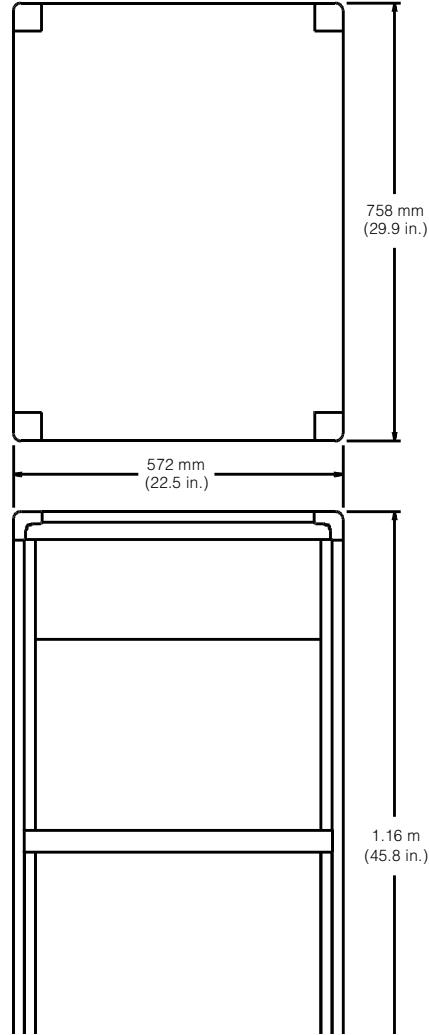


MTL-1X Double 18-inch SubScoop™ Low-Frequency Speaker System

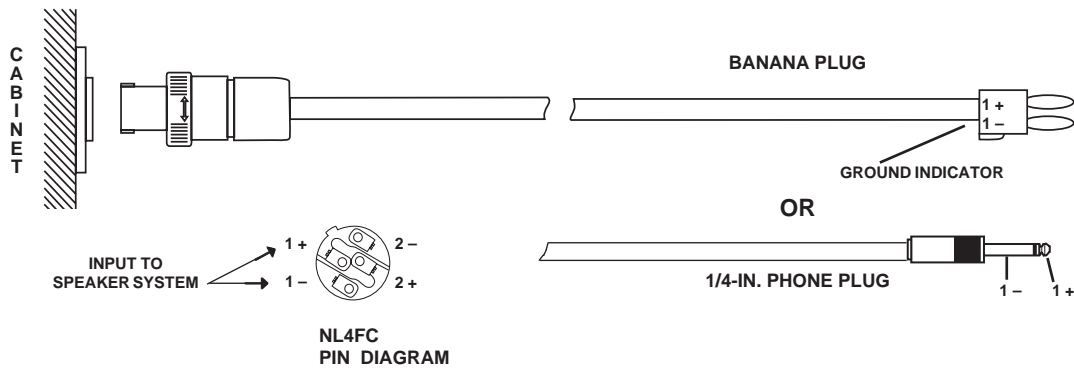
# MTL-1X Double 18-inch SubScoop™ Low-Frequency Speaker System

MTL-1X Double 18-inch SubScoop™ Low-Frequency Speaker System

**Figure 3—Dimensions**



**Figure 4—Two-Conductor Cable Configurations Using Neutrik Speakon® NL4FC Four-Pin Connector**



# MTL-1X Double 18-inch SubScoop™ Low-Frequency Speaker System

## Specifications

**Typical Axial Frequency Response, (swept sine wave, 4 volts at 10 feet, anechoic environment, normalized for 1 watt, 1 meter into woofer; see Figure 1):**

50-160 Hz

**Low-Frequency 3-dB-Down Point:**

50 Hz

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

45 Hz

**Half-Space Reference Efficiency:**

6.1%

**Long-Term Average Power-Handling Capacity per EIA RS-426-A 1980 (see Power-Handling Capacity section):**

1200 watts

**Sensitivity (SPL at 1 watt, 1 meter input, anechoic environment, swept sine wave):**

101 dB

**Dispersion Angle Included by 6-dB-Down Points on Polar Responses:**

Essentially omnidirectional

**Distortion, 0.1 Full Power Input into Mid/Bass, (see Figure 2)**

**Second Harmonic, 100 Hz:**

0.3%

**Third Harmonic, 100 Hz:**

0.4%

**Transducer Complement:**

Two EVX-180B's

**Box Tuning Frequency:**

38 Hz

**Recommended Crossover Frequency:**

160 Hz

**Crossover Slopes, suggested:**

24 dB per octave

**Impedance,**

**Nominal:**

4 ohms

**Minimum:**

3 ohms

**Input Connections:**

Two paralleled Neutrik Speakon® connectors

**Suspension (see Suspending MTL-1X Enclosures section):**

HSMT-1 independently certified hanging kit

**Materials,**

**Enclosure:**

Black, carpet-covered 3/4-in. void-free plywood

**Grille:**

Black, heavy-duty perforated metal

**Enclosure Dimensions (see Figure 3),**

**Height:**

1.16 m (45.8 in.)

**Width:**

572 mm (22.5 in.)

**Depth:**

758 mm (29.9 in.)

**Net Weight:**

75.0 kg (165 lb)

**Shipping Weight:**

86.4 kg (190 lb)

## Electro-Voice®

600 Cecil Street, Buchanan, MI 49107

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