

TL15-1ESX TL15-1ES

Low-Frequency Speaker Systems

- Ultrathin depth of 254 mm (10.0 in.) overall allows for installation in very tight areas
- 38-Hz low end for rich bass
- Top-mounted input panel permits mounting flush against a wall
- DL15MT 381-mm (15-in.) woofer for trouble-free operation
- Black textured wood grain vinly finish
- TL15-1ESX low-frequency speaker system (includes XEQ-1108 passive crossover)

Description

The Electro-Voice TL15-1ES and TL15-1ESX is a member of the TL series of low-frequency enclosures. The TL15-1ES and TL15-1ESX is a direct-radiating vented design that provides high efficiency, low distortion and very good low-frequency performance in a very compact enclosure. The TL15-1ES and TL15-1ESX employs a single 381-mm (15-in.) loudspeaker in a 133-liter (4.7-ft³) enclosure.

The TL15-1ES and TL15-1ESX has two features which allow for positioning in tight areas that are not possible with traditional low-frequency designs. The thin, 10.0-inch depth combined with the top-mounted input panel means the enclosure can be pushed against the wall. One such place where this can be used to its advantage is behind screens in small movie theatres.

The TL15-1ES and TL15-1ESX's 38-Hz low-frequency 3-dB-down point makes it appropriate for both voice and music playback and sound reinforcement.

The enclosure is made from 0.75-in. particle board with a black wood grain vinyl-laminate. Connections are made via barrier strip (#10) recessed into the top of the enclosure on a durable molded connector panel.

Frequency Response

The TL15-1ES and TL15-1ESX's axial frequency response was measured in Electro-Voice's large anechoic chamber at a distance of 3.05 meters (10 feet) with a swept sine-wave input of 4 volts. Figure 1 has been averaged and normalized for 1 watt at 1 meter.

Directivity

The directional characteristics of the TL15-1ES and TL15-1ESX were measured in Electro-Voice's large anechoic chamber. The test signal was one-third-octave filtered pink noise at the frequencies indicated. A full spherical measurement system was used. All directional information was measured at 6.10 meters (20 feet).

Figure 2 illustrates the horizontal and vertical polar responses.

Figure 3 shows the horizontal and vertical beamwidths. Beamwidth is the angle at which the horizontal and vertical polar responses have decreased in level by 6 dB when compared to the axial frequency response.

Figure 4 illustrates the total directivity of the TL15-1ES and TL15-1ESX. The directivity factor R_0 (Q) is the ratio of the SPL of the TL15-1ES and TL15-1ESX at a given

point to the SPL of an ideal omnidirectional source at that same point. The directivity index, D_i , is calculated by:

$$(D_i = 10 \log_{10} R)$$

Power Handling

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 TL15-1ES and TL15-1ESX passes EIA RS-426-A 1980 with the following values:

$$R_{SR} = 6.9 \text{ ohms } (1.15 \times R_E)$$

$$P_{E(MAX)} = 400 \text{ watts}$$

$$\text{Test voltage} = 52.5 \text{ volts rms,} \\ 105 \text{ volts peak}$$

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The "peak" power-handling capacity of a woofer is determined by the peak test voltage amount. For the TL15-1ES and TL15-1ESX, a 105-volt peak test voltage translates into 1,600-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.

Amplifier Power Recommendations

As noted in the Power-Handling section above, the TL15-1ES and TL15-1ESX has a random-noise power capacity of 400 watts long term (1,600 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 TL15-1ES and TL15-1ESX 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 TL15-1ES and TL15-1ESX, this is 800 to 1,600 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 TL15-1ES and TL15-1ESX, this is 400 to 560 watts.

3. To be very conservative, one can use an amplifier rated at 0.5 to 0.7 times the long-term average noise power rating of the loudspeaker. For the TL15-1ES and TL15-1ESX, this is 200 to 280 watts.

Request P.A. Bible Addition No. Two

("Power-Handling Capacity") for more background on these recommendations.

Subpassband Speaker Protection

Below the enclosure tuning frequency, cone excursion increases rapidly. Since acoustic output is also falling, there is no utility in driving the system with signals much below tuning frequency. While such signals may be in the program material, they are often extraneous, such as a dropped microphone. Therefore, on the TL15-1ES, it is recommended to use a filter for below the bassband, which is 38 Hz. The Electro-Voice Dx34, EX-24, XEQ-2, and XEQ-3 electronic crossover/equalizers can provide this subpassband protection. The 3-dB-down point is user-controlled on the Dx34, 30 Hz on the EX-24 and XEQ-2, and 16 Hz or 32 Hz on the XEQ-3.

Other high-pass filters are available and one-third-octave filters can also be effective at providing the required protection.

Where as the TL15-1ESX is equipped with the Electro-Voice XEQ-1108 passive crossover, providing all the necessary filter equalization and bandpass protection for smooth efficient operation. See XEQ-1108 data sheet for more information

Suspending TL15-1ES and TL15-1ESX Enclosures

The TL15-1ES and TL15-1ESX is designed for typical cinema stage (behind-the-screen) applications where subwoofers are mounted on the stage floor. **The TL15-1ES and TL15-1ESX is not designed to be self-suspended from above, and if suspended, must be supported and hung in a way which does not depend on the structure of the TL15-1ES and TL15-1ESX itself for support.**

Enclosure Construction

The TL15-1ES and TL15-1ESX is ruggedly constructed of 19-mm (0.75-inch) particle board. The cabinet is braced to reduce panel resonances. It is finished with black textured vinyl.

Service

In the unlikely event the TL15-1ES and TL15-1ESX requires service, the woofer can be replaced or serviced from the front. A service data sheet is available from Electro-Voice.

Architects' and Engineers' Specifications

The loudspeaker system shall be a low-frequency bass-reflex design. A 381-mm (15-in.) woofer shall be front mounted in a 133-liter (4.7-ft³) enclosure. The woofer shall be an Electro-Voice DL15MT with a long-term noise power capacity of 400 watts per EIA RS-426-A 1980. The system will meet the following criteria: axial frequency response from 38 to 2,000 Hz; sensitivity of 96 dB at 1 watt/1 meter; impedance of 8 ohms nominal and 6.9 ohms minimal; dispersion of 130° x 140° at 500 Hz. The system shall be capable of producing average sound levels in excess of 121 dB in the long term, and short-term peaks of 127 dB vinyl laminated.

The black wood grain vinyl laminated enclosure, constructed of groove folded 19-mm (0.75-in.) particle board. The enclosure shall contain sound-absorbing glass wool. The connections shall be #10 screw terminals on barrier strip. The dimensions shall be 1.004 m (39.50 in.) tall, 680 mm (26.75 in.) wide, and 254 mm (10.00 in.) deep. Net weight shall be 33.6 kg (74 lb).

The loudspeaker system shall be the Electro-Voice TL15-1ES and TL15-1ESX.

Specifications subject to change without notice.

Uniform Limited Warranty Statement

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 fin-

TL15-1ES and TL15-1ESX Low-Frequency Speaker Systems

Figure 4—TL15-1ES and TL15-1ESX Directivity responses (anechoic environment, 4 volts/6.10 meters (20 feet))

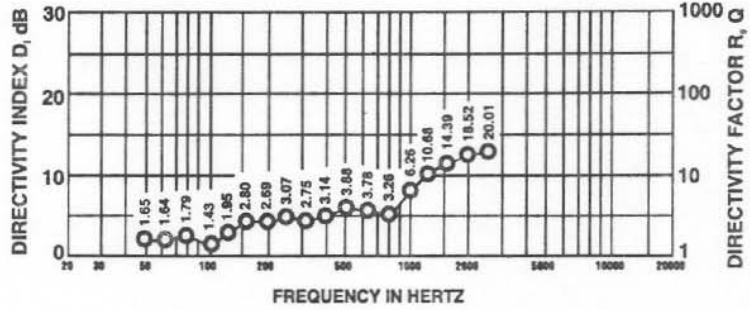
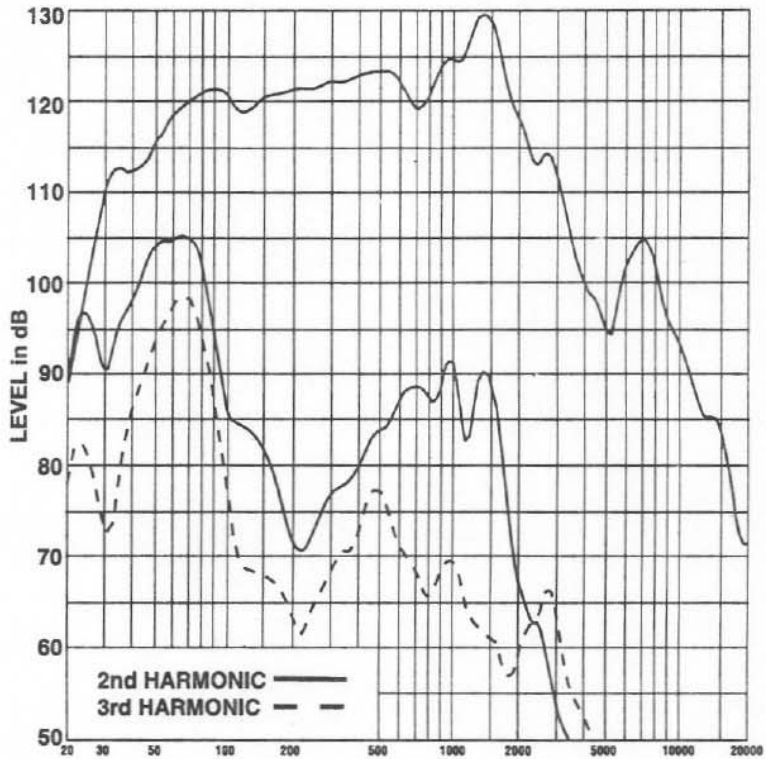
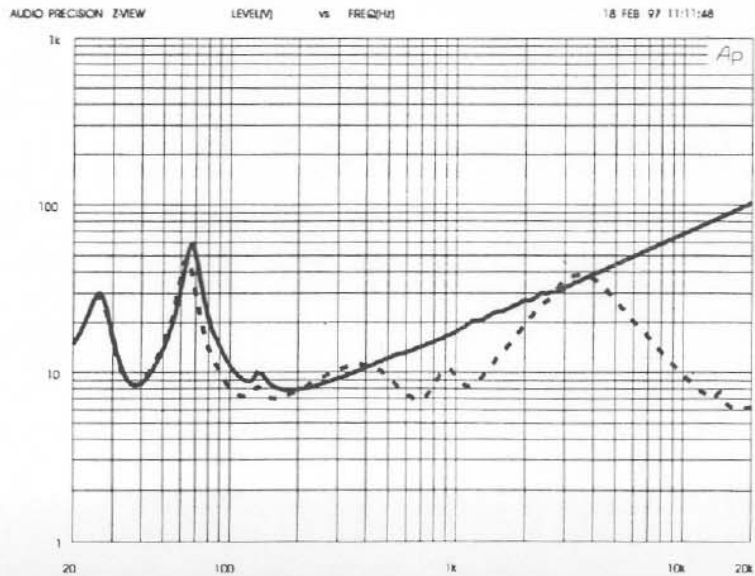


Figure 5—TL15-1ES and TL15-1ESX Harmonic Distortion, 0.1 rated power input (40 watts), 3.05 meters (10 feet) on axis.



**Figure 6—Impedance Curve
TL15-1ES —————
TL15-1ESX - - - - -**



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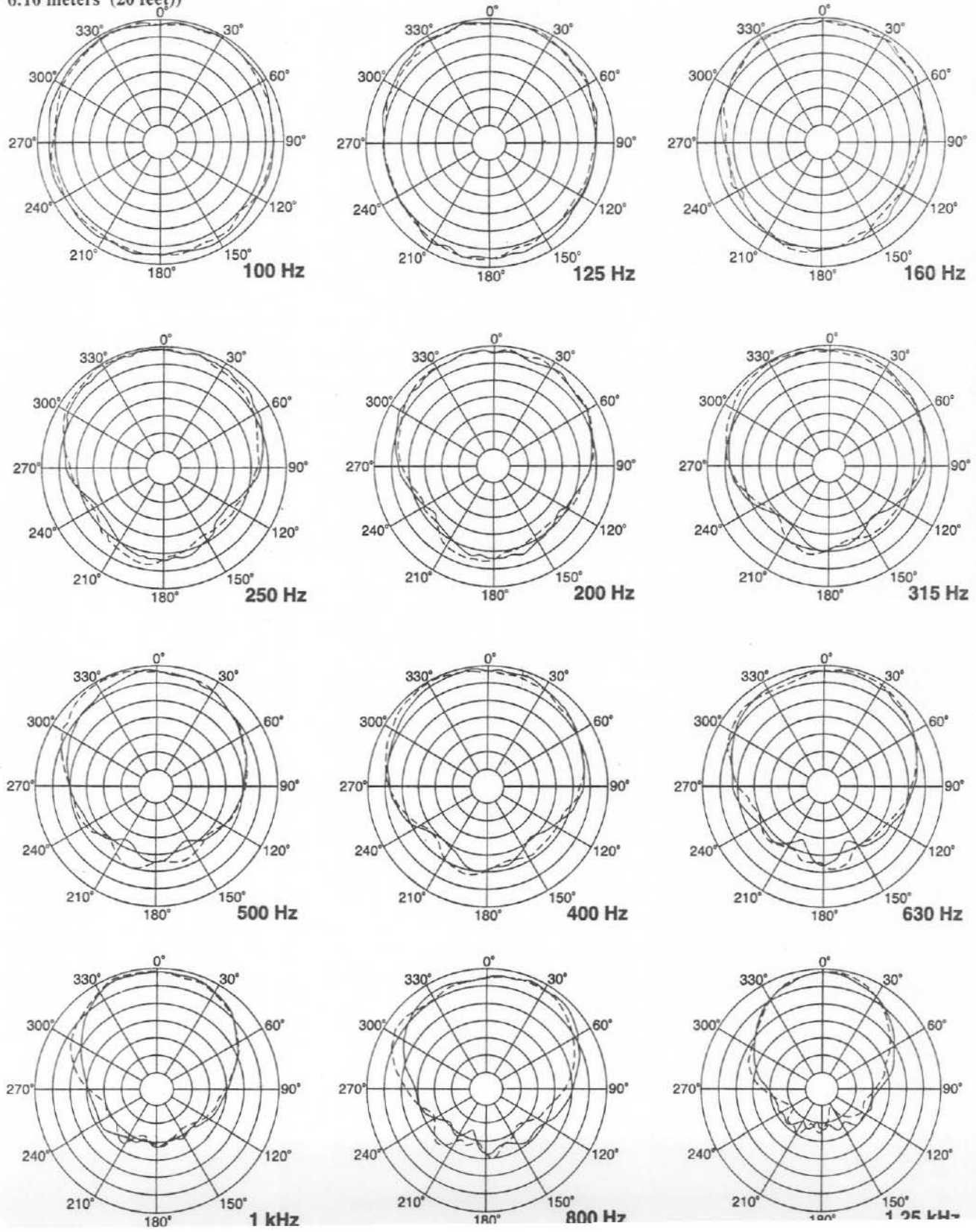
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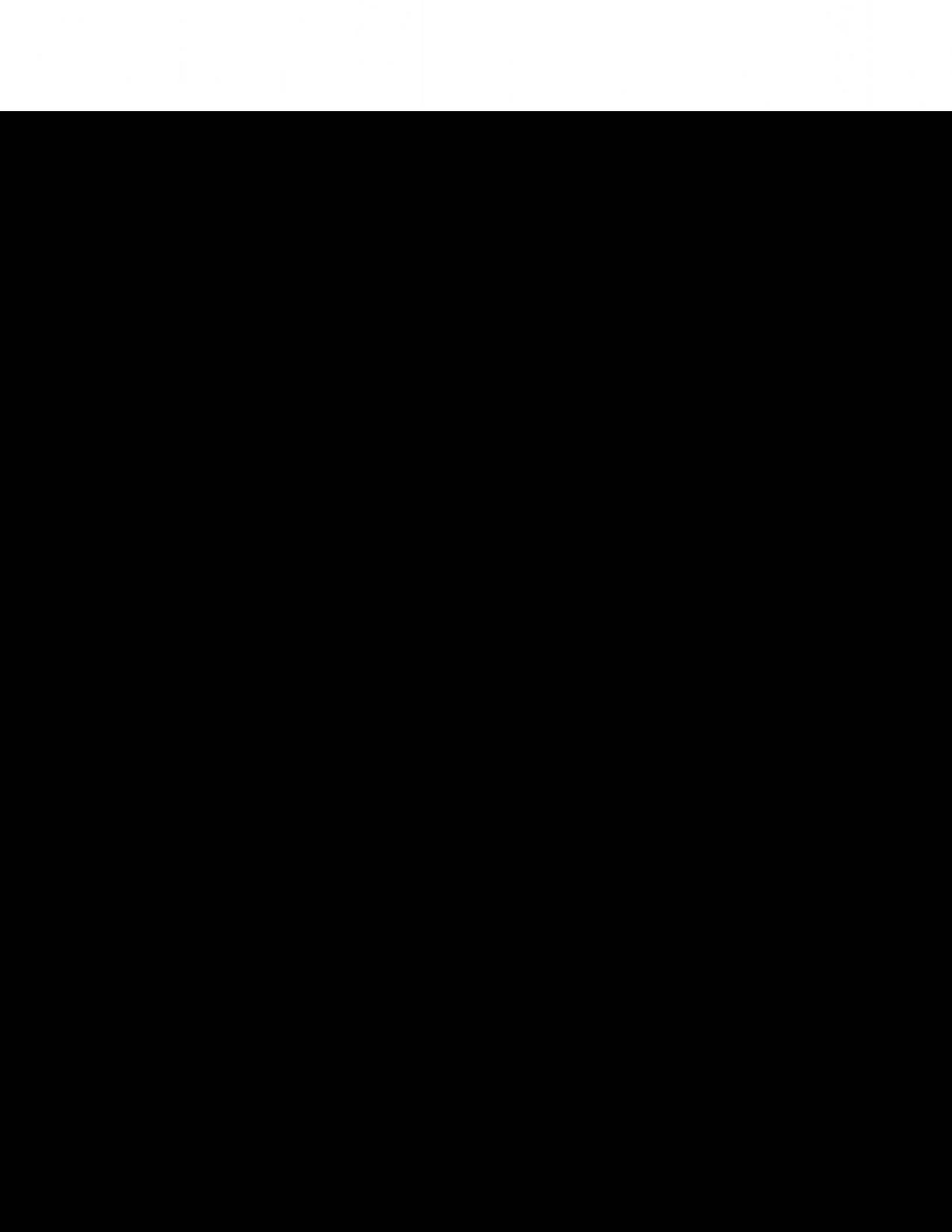
TL15-IES and TL15-ESX Low-Frequency Speaker Systems

Figure 2—TL15-IES and TL15-IESX
One-third octave polar responses
 (anechoic environment, 4 volts/
 6.10 meters (20 feet))

5 dB per division

Horizontal ———
 Vertical - - -





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

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 origi-

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.

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.

Figure 1—TL15-1ES and TL15-1ESX Axial Frequency Response (anechoic environments, 1 watt/1 meter)

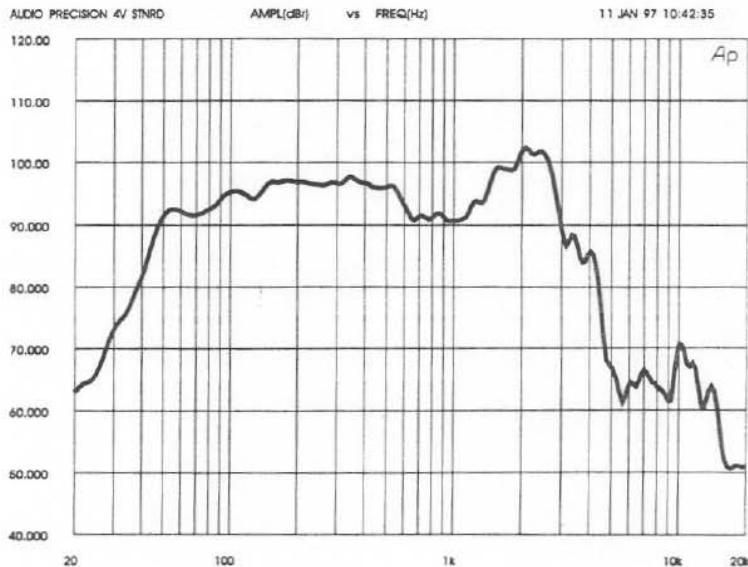
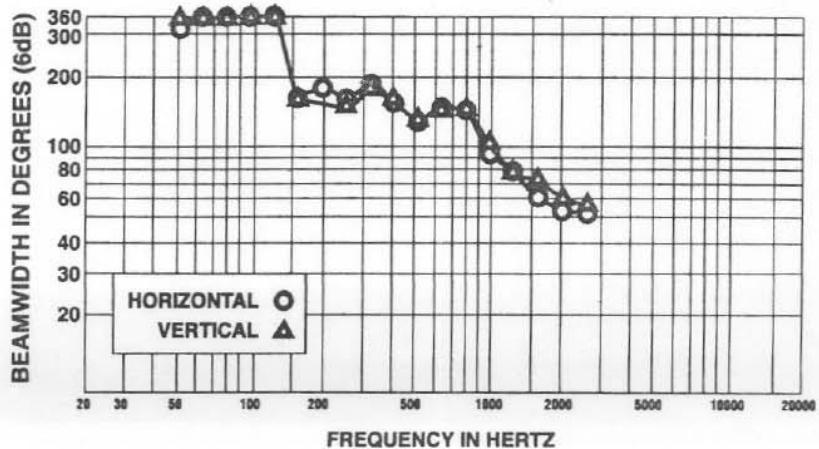
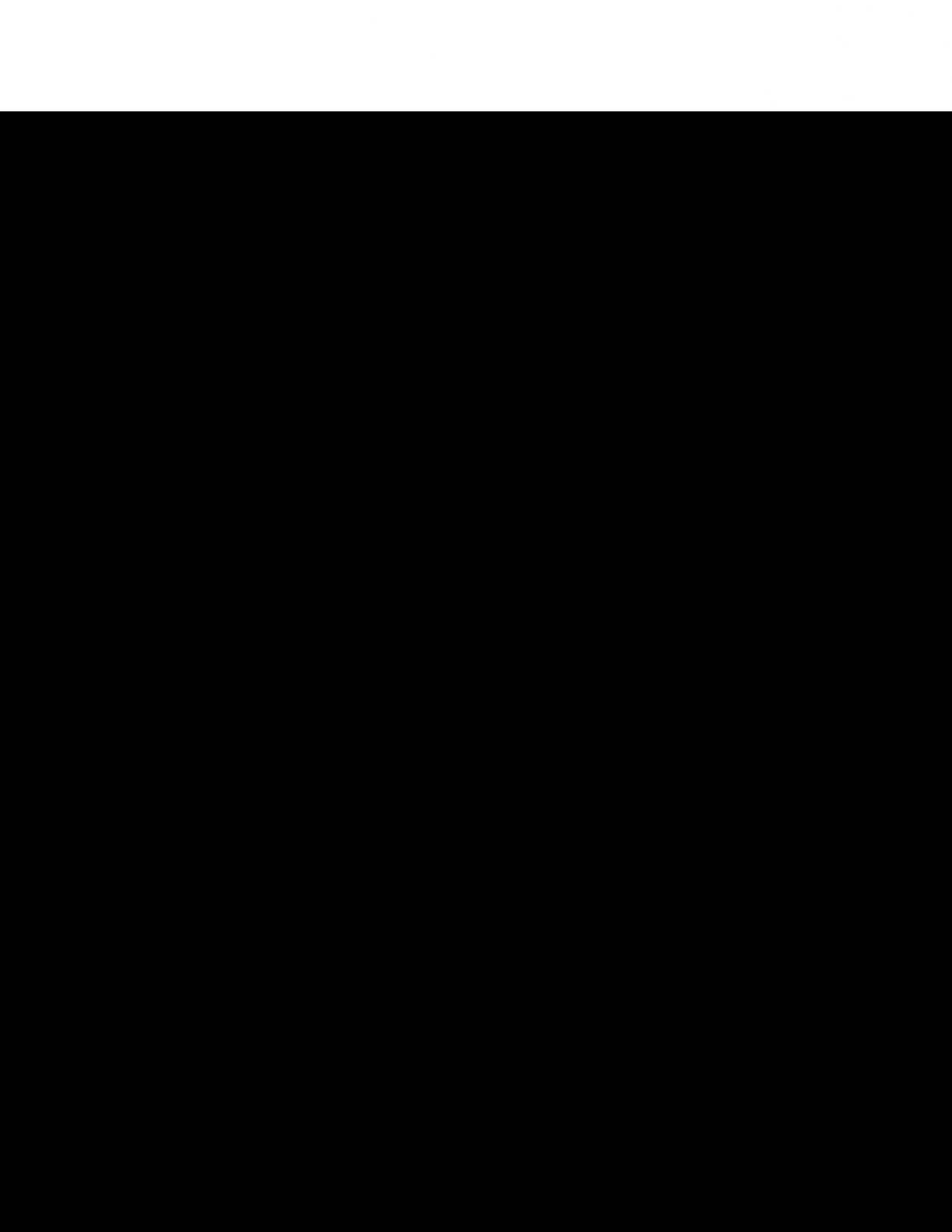


Figure 3—TL15-1ES and TL15-1ESX Beamwidth Response (anechoic environment, 4 volts/6.10 meters (20 feet))





TL15-1ESX and TL15-1ES Low-Frequency Speaker Systems

woofer (see Figure 1):

38-2,000 Hz

Low-Frequency 3-dB-Down Point:

38 Hz

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

30 Hz

Efficiency:

4.1%

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

400 watts

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

96 dB

Dispersion Angle Included by 6-dB-Down Points on Polar Responses, Indicated One-Third-Octave Bands of Pink Noise (see Figure 3),

40-125 Hz, Horizontal and Vertical:
360°

125-2,000 Hz:

6.0

Directivity Index D_i ($10 \log_{10} R$), Median over Indicated Range (see Figure 4),

40-125 Hz:

2.2 dB

125-2,000 Hz:

6.6 dB

Distortion, 0.1 Full Power Input, (see Figure 5),

Second Harmonic,

100 Hz:

2.1%

1,000 Hz:

2.2%

Third Harmonic,

100 Hz:

0.9%

1,000 Hz:

0.2%

Impedance (see Figure 6),

Nominal:

8.0 ohms

Minimum:

6.9 ohms

Input Connections:

Screw terminals (#10) on barrier strip

Enclosure Materials and Finish:

Black vinyl clad 19-mm (0.75-in.) particle board

Enclosure Dimensions,

Height:

1.004 m (39.50 in.)

Width:

680 mm (26.75 in.)

Depth:

254 mm (10.00 in.)

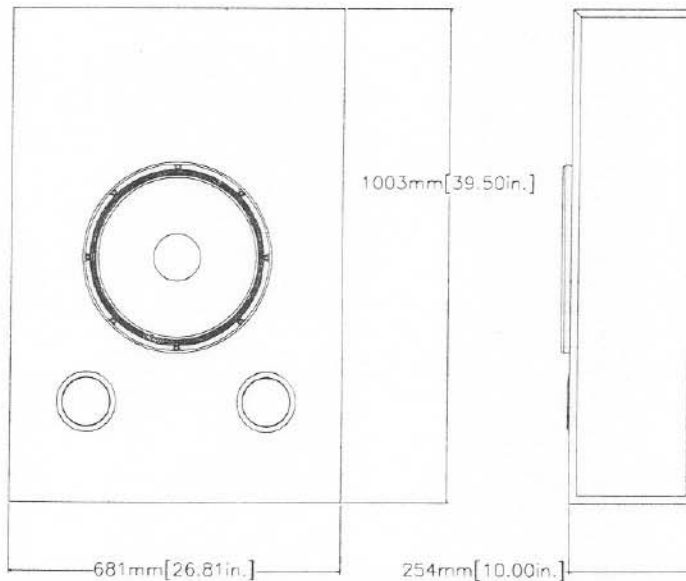
Net Weight:

33.6 kg (74 lb)

Shipping Weight:

37.3 kg (82 lb)

Figure 7—Dimension drawing of TL15-1ESX and TL15-1ES



Electro-Voice®

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