



109 SERIES

8-Inch Full-Range Ceiling Loudspeakers

- 109-8A, 8ohm, 5 watts (EIA RS426-A)
- 109-4T70, with 4 watt 70 volt multi-tap transformer
- 109-4T70WB, with 4 watt 70 volt multi-tap transformer and grille
- High efficiency: 94 dB for 1W @ 1M
- Maximum SPL: 101 dB for 5W @ 1M
- Frequency response: 85 Hz - 15 kHz
- Wide dispersion

Description

The Altec Lansing 109, 109-4T70 and 109-4T70WB loudspeaker systems are high quality 8-inch, full-range loudspeakers for distributed sound systems. A small, centrally mounted, free-edge cone is utilized for extended response and to improve high-frequency dispersion. These speakers offer wide dispersion, high-efficiency, ease of installation and wide range reproduction of music or voice.

To ensure long-term reliability in installations, the 109 is designed to handle 5 watts continuous power (20-watts peak) of shaped white noise signal for eight hours per EIA RS-426-A 1980.

The 109-4T70 is provided with a 70 volt transformer that offers a selection of 0.25 watts, 0.5 watts, 1 watt, 2 watts and 4 watts, delivered to the loudspeaker system. The 109-4T70WB offers the same performance, and includes a premounted ceiling grille.

Directional Performance

The directional characteristics of the 109 in a 1.8 cubic-foot vented enclosure were measured by running a set of polar responses in Altec Lansing's large anechoic chamber. The

test signal was 1/3-octave-band-limited pseudo-random pink noise centered at the ISO standard frequencies indicated in Figure 3.

Additional typical data is provided in Figures 4 and 5, which indicate 6-dB-down beamwidth versus frequency and directivity factor, respectively, for a 109 in the test enclosure.

Power Handling Test

The 109 is designed to withstand the power test described in EIA RS-426-A 1980. 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 usual constant-percentage-bandwidth analyzer (one-third-octave), this shaping filter produces a spectrum whose 3-dB-down points are at 100 Hz and 1,200 Hz, with a 3-dB-per-octave slope above 1,200 Hz. This shaped signal is sent to the power amplifier with the continuous power set at 5 watts into the EIA equivalent impedance (6.1 volts true RMS). Amplifier clipping sets instantaneous

peaks at 6 dB above the continuous power, or 20 watts peak (12.2 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

Recommended Connections

The 109 is a nominal 8-ohm impedance loudspeaker with a 5-watt input capability. However, it is also available with transformer. The 109-4T70 utilizes a 4-watt, 70.7 volt universal line matching transformer with power taps ranging from 0.25 to 4 watts. The transformer is mounted to the frame and the primary winding is accessible for the user to select any of the power taps indicated in Table 1. For use with 100 V lines, connect to the 70.7 V primary winding, and use Table 1 to determine the wattage ratings of various secondary winding taps. Do not use the tap marked 4 W.

All wattages marked for the various taps refer to the load on the amplifier, with the insertion loss of the transformer being less than 2 dB.

Recommended Enclosures and Baffles

The 109-8A, 109-4T70 and 109-4T70WB are designed to fit on standard 8-inch ceiling speaker baffles. Additionally, these loud-

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speakers will accommodate the use of any standard back enclosure with a diameter of 8.5 inches or greater and a depth of at least 3.5 inches. Larger back volumes will increase the low-frequency output. The frequency response of a 109 in a typical 1.8-cubic-foot back enclosure is shown in Figure 1.

Mounting

The 109 may be front- or rear-mounted against either surface of its mounting flange and requires a 18.4 cm (7.25 in.) diameter cutout and a 19.5 cm (7.68 in.) bolt circle. Normal fasteners up to 5 mm (0.20 in.) will fit through the eight holes in the frame.

Architects' and Engineers' Specifications

The loudspeaker shall be a dual-cone type with an 8-inch low-frequency cone with a centrally mounted free-edge tweeter cone. The loudspeaker shall meet the following criteria. EIA RS-426-A 1980 power rating shall be 5 watts of band limited pink noise (85 Hz to 15,000 Hz, 6-dB crest factor). Frequency response, uniform from 85 Hz to 15,000 Hz. Pressure sensitivity, 94 dB SPL at 1 meter (92 dB at 4 feet) on axis with one watt of band-limited pink noise from 200 Hz to 4,000 Hz (ref. 20 uPa). Minimum impedance, 7.0 ohms. The loudspeaker shall be 206 mm (8.1 in.) in diameter and 66 mm (2.6 in.) deep. The 109 shall weigh 0.7 kg (1.6 lb); the 109T shall weigh 1.1 kg (2.4 lb). The loudspeakers shall be the Altec Lansing models 109-8A, 109-4T70, 109-4T70WB.

Limited Warranty

Altec Lansing 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. Altec Lansing 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.

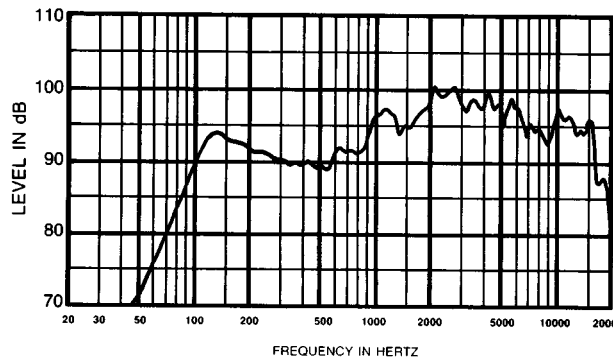
Altec Lansing Speakers and Speaker Systems are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Altec Lansing 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.

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.

Figure 1—Axial Frequency Response
1 Watt/1 Meter



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Figure 2—Input Impedance vs. Frequency

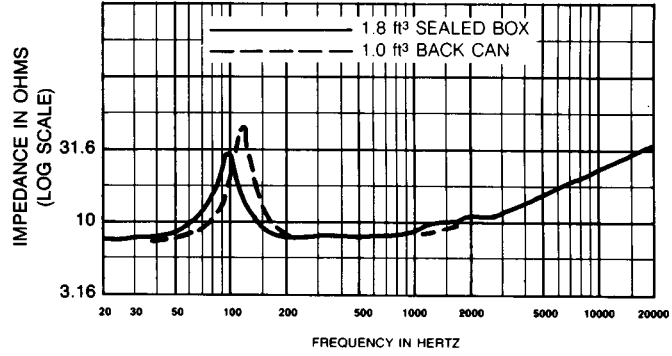


Figure 3—109 Polar Response in 1.8 ft3 Sealed Box 4V RMS of 1/3-Octave-Band-Limited Noise in Anechoic Environment, 10 Feet on Axis

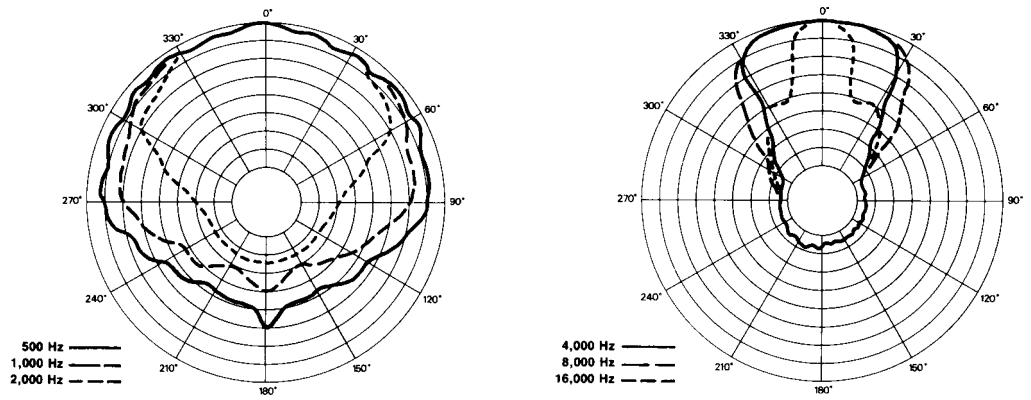


Figure 4—109 Beamwidth vs. Frequency in 1.8 ft3 Sealed Box

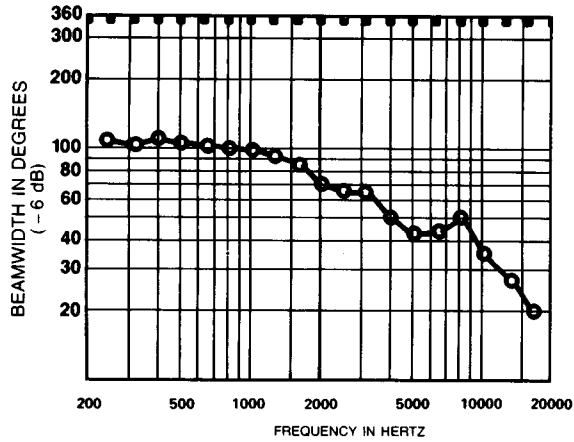
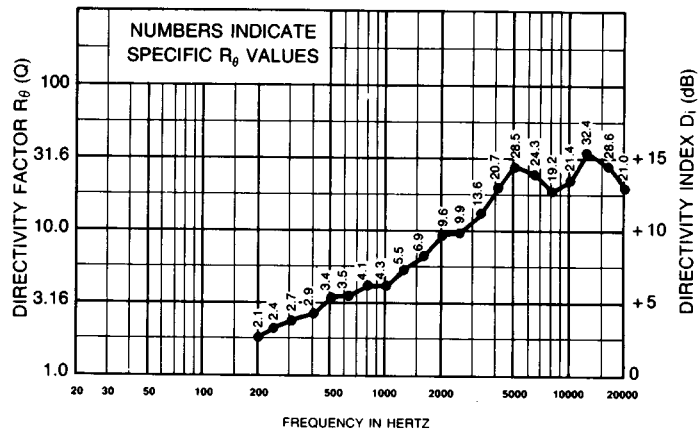


Figure 5—109 Directivity factor and Directivity Index vs. Frequency in a 1.8 ft3 Sealed Box



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Figure 6—Wiring

109-4T70

Table 1	70 V	100 V
4.0 W	BLUE	WHITE
2.0 W	WHITE	GREEN
1.0 W	GREEN	RED
0.5 W	RED	YELLOW
0.25 W	YELLOW	N/A
8 ohms Common	White	White

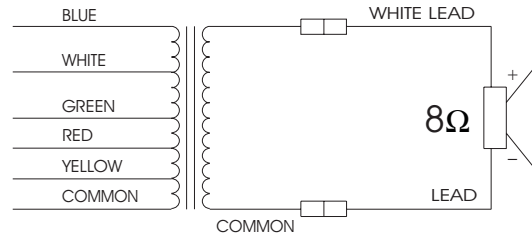
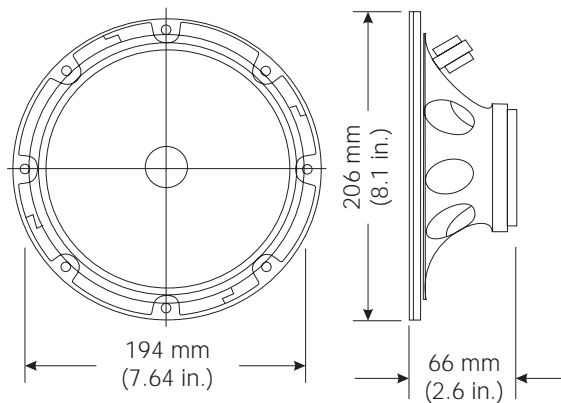


Figure 7—Dimensions



Specifications

Frequency Response:

85-15,000 Hz, ± 5 dB (see Figure 1)

Power-Handling:

5 watts (EIA RS-426A)

Impedance,

Nominal:

8 ohms

Minimum:

7 ohms (210 Hz)

Sound Pressure Level at 1 Meter,

1 Watt Input, 200-4,000 Hz Average:

94 dB

Maximum SPL:

101dB for 5W @ 1M

Voice-Coil Diameter:

1.91 cm (0.75 in.)

Magnet Weight:

0.16 kg (0.36 lb)

Magnet Material:

Barium Ferrite

Flux Density:

1.0 Tesla

Speaker Frame:

22-gauge stamped steel

Frame Color:

Black

Dimensions,

109/109-4T70:

Diameter:

206 mm (8.1 in.)

Height:

66 mm (2.6 in.)

109-4T70WB:

Diameter:

330 mm (13.0 in.)

Height:

76 mm (2.6 in.)

Net Weight,

109-8A:

0.7 kg (1.6 lb)

109-4T70:

1.1 kg (2.4 lb)

109-4T70WB:

2.1 kg (2.9 lb)

Transformer Input (109):

70.7/100-volt line



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