

## 407 SERIES

### 6.5-Inch Duplex Full-Range High Performance Ceiling Loudspeakers

- **407-8A**, 8 ohm, 16 watts (EIA RS-426-A)
- **407-8T**, with 8 watt multi-tap transformer
- **407-16T**, with 16 watt multi-tap transformer
- High efficiency: 93 dB for 1W @ 1M
- Maximum SPL: 105 dB for 16W @ 1M
- Frequency response: 95 Hz - 18 kHz
- Wide dispersion
- Duplex construction

#### Description

The Altec-Lansing 407 series are high-quality 6.5-inch duplex loudspeaker for distributed sound systems available in three versions: standard 8-ohm (407-8A), 8-ohm with 8 W transformer (407-8T) and 8-ohm with 16 W transformer (407-16T).

The loudspeakers feature 6.5-inch low-frequency cones and high-temperature voice-coil assemblies coaxially mounted with wide-dispersion neodymium tweeters. The dual-magnet construction allows each speaker to be electrically and mechanically independent of the other. The 407-8A loudspeaker utilizes a crossover network, centered at 3,000 Hz, that provides tweeter protection outside of its operating range.

The 407-8A is suitable for use in applications requiring highly intelligible speech or smooth musical reproduction.

To ensure long-term reliability in installations, the 407-8A is designed to handle 16 watts continuous power (64 watts peak) of shaped white noise for eight hours per ANSI/EIA RS-426-A 1980.

The 407-8T utilizes a transformer that offers a selection of 1-, 2-, 4- and 8-watt taps delivered to the loudspeaker system using either 70-V or 100-V lines.

The 407-16T utilizes a transformer that offers a selection of 2-, 4-, 8- and 16-watt taps delivered to the loudspeaker system using either 70-V or 100-V lines.

#### Directional Performance

The directional characteristics of the 407-8A 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 one-third-octave-band-limited pseudo-random pink noise centered at the ISO standard frequencies indicated in Figure 1.

Additional typical data is provided in Figures 4 and 5, which indicate 6-dB-down beamwidth versus frequency and directivity factor, respectively, for a 407-8A in the test enclosure.

#### Power-Handling Test

The 407-8A is designed to withstand the power test described in ANSI/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 a 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 16 watts into the EIA equivalent impedance (11.3 volts true RMS). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 64-watts peak (22.6 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

#### Recommended Connections

The 407-8A is a nominal 8-ohm impedance loudspeaker with a 16-watt input capability. The 407-8T utilizes an 8-watt, 70.7-, 100-volt universal line-matching transformer with power taps ranging from 1 to 8 watts. The 407-16T utilizes a 16-watt, 70.0-, 100-volt universal line-matching transformer with power taps ranging from 2 to 16 watts.

#### Recommended Enclosures and Baffles

The 407-8A, 407-8T, 407-16T are designed to fit on standard 6.5-inch ceiling speaker baffles. Additionally, these loudspeakers will



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accommodate the use of any standard back enclosure with a diameter of 6.8-inches or greater and a depth of at least 4.5 inches. Larger back volumes will increase the low-frequency output. The frequency response of a 407-8A in a typical 0.5-cubic-foot back enclosure is shown in Figure 1.

### Mounting

The 407-8A may be front or rear mounted against either surface of its mounting flange and requires a 145-mm (5.70-in.) diameter cutout and a 154-mm (6.08-in.) bolt circle, as shown in Figure 7. Normal fasteners up to 5 mm (0.20 in.) will fit through the four holes in the frame. The 407-8A is designed for mounting on standard ceiling speaker baffles.

### Architects' and Engineers' Specifications

The loudspeaker shall be a ceiling loudspeaker with a nominal diameter of 167 mm (6.6 in.), an overall depth of 62 mm (2.45 in.) for the 407-8A, and 119 mm (4.70 in.) for the 407-8T and 407-16T, and shall weigh no more than 1.0 kg (2.2 lb) for the 407-8A, 1.5 kg (3.3 lb) for the 407-8T and 407-16T. The voice coil shall have a nominal diameter of 25.4 mm (1.0 in.) and length of 7.6 mm (0.3 in.) and shall operate in a gap of not less than 1.0 T (10,000 Gauss). The loudspeaker shall exhibit a sensitivity (SPL, 1 watt at 1 meter (3.28 ft), averaged 200-4,000 Hz) of no less than 93 dB on axis maintaining an essentially flat frequency response with 3-dB-down points at 95 and 18,000 Hz in a one-cubic-foot sealed box in a free field. The half-space reference efficiency shall be 0.8%. The nominal impedance shall be 8 ohms and the dc resistance shall be 7.0 ohms. The loudspeaker shall be capable of handling a continuous 16-watt (11.3 volts true RMS) shaped white-

noise signal (as per ANSI/EIA RS-426-A 1980) with a 6-dB crest factor for eight hours. The loudspeaker shall be the Altec Lansing model 407-8A. When fitted with a transformer that allows connection to 70.7-, 100-volt systems of 1 to 8 watts, the loudspeaker shall be referred to as the Altec Lansing model 407-8T, and when fitted with a transformer that allows connection to 70.7-, 100-volt systems of 2 to 16 watts, the loudspeaker shall be referred to as the Altec Lansing model 407-16T.

### 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 autho-

rized 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.



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Figure 1—Frequency Response

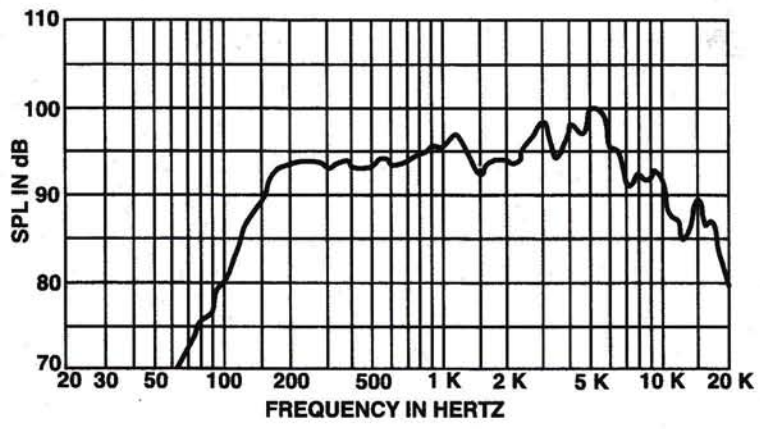
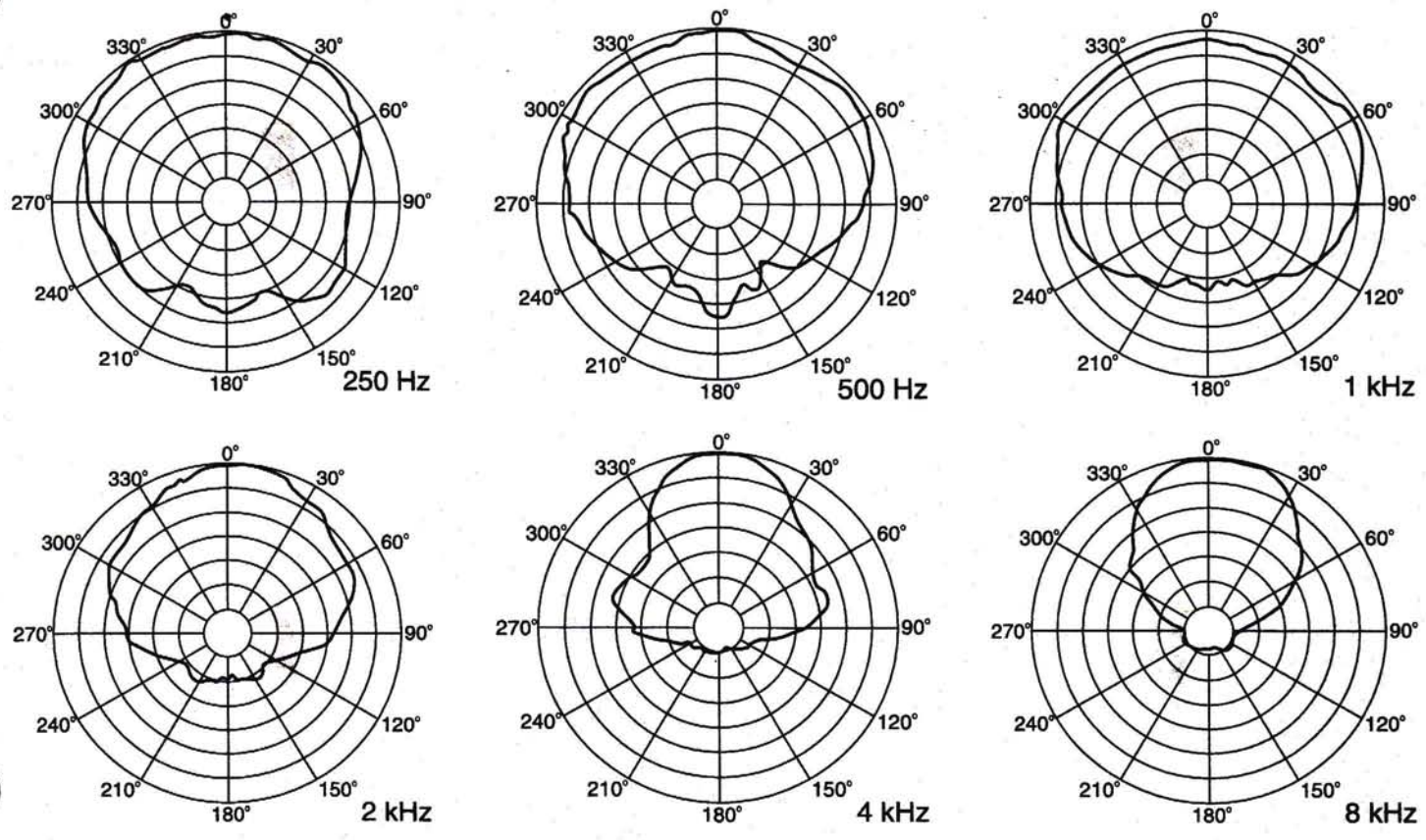


Figure 2—Polar Response



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Figure 3—Impedance

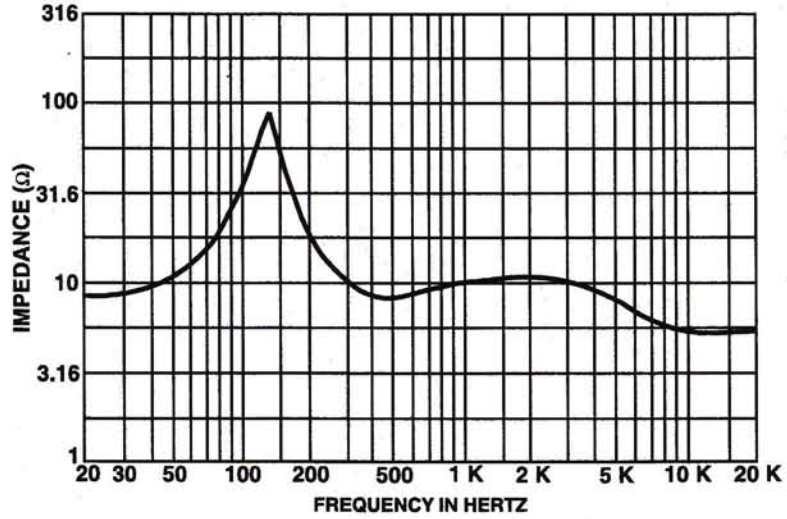


Figure 4—Beamwidth

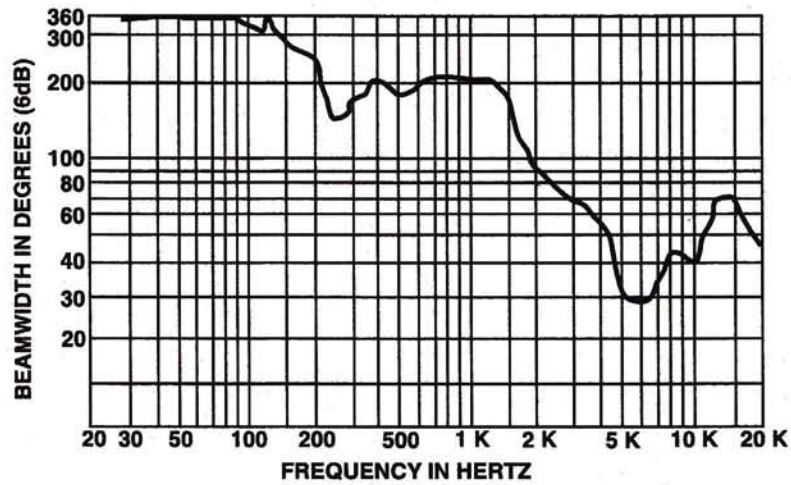
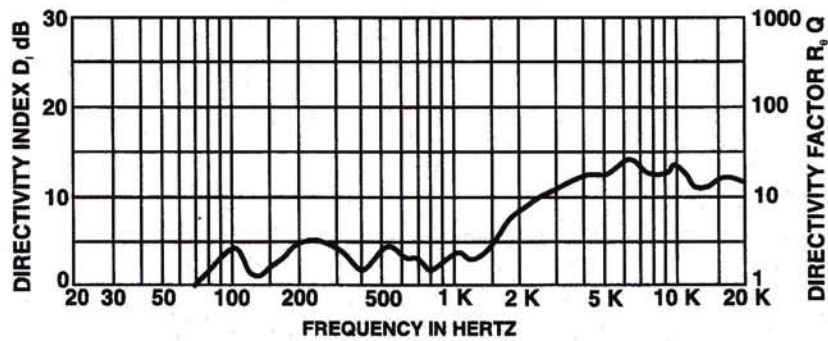


Figure 5—Directivity



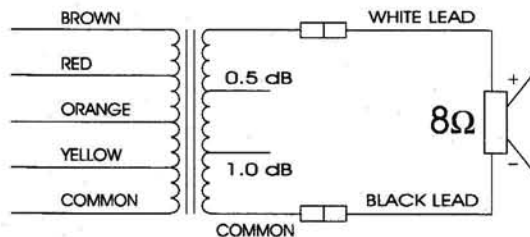
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Figure 6—Wiring

## 407-8T

Table 1	70 V	100 V
8.0 W	BROWN	RED
4.0 W	RED	ORANGE
2.0 W	ORANGE	YELLOW
1.0 W	YELLOW	N/A
COMMON	BLACK	BLACK
8 ohms	White	White
Common	Black	Black



## 407-16T

Table 2	70 V	100 V
16.0 W	BROWN	RED
8.0 W	RED	ORANGE
4.0 W	ORANGE	YELLOW
2.0 W	YELLOW	N/A
COMMON	BLACK	BLACK
8 ohms	White	White
Common	Black	Black

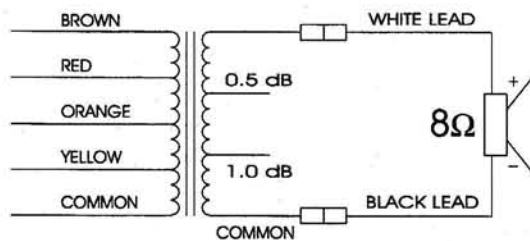
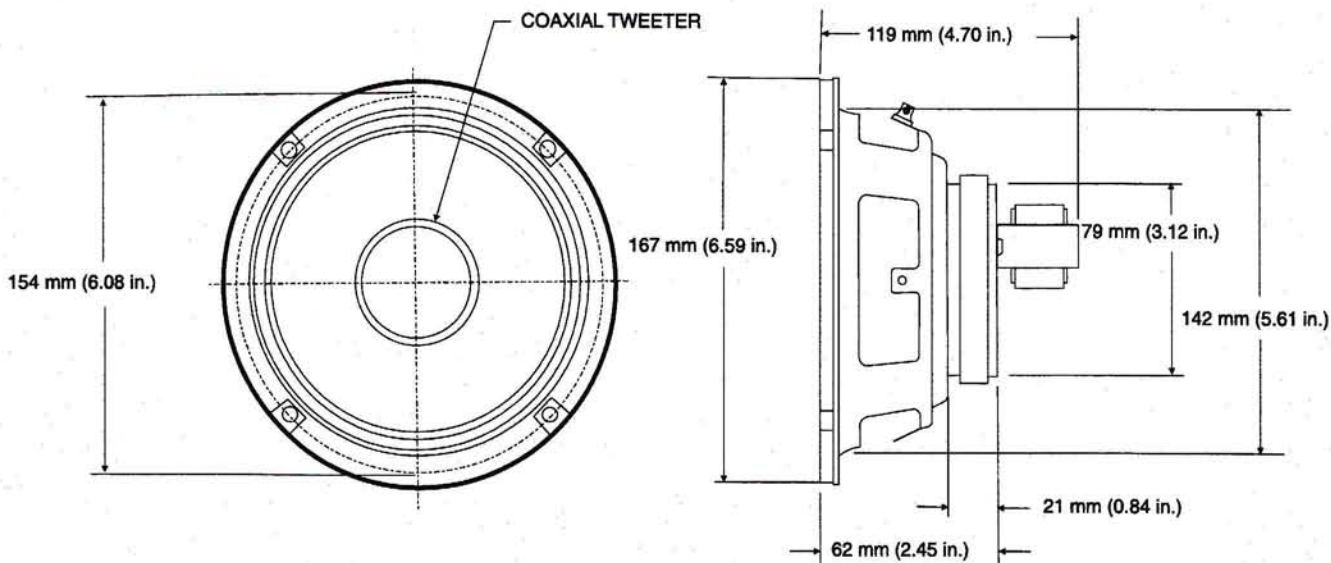


Figure 7—Dimensions





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## Specifications

### Frequency Response:

95-18,000 Hz,  $\pm 5$  dB (see Figure 1)

**Power-Handling Capacity per ANSI/EIA RS-426-A 1980 (85- to 15,000-Hz band-limited pink noise, 6-dB crest factor):**

16 watts

### Impedance,

**Nominal:**

8 ohms

**Minimum:**

5 ohms (15 kHz)

### Sound Pressure Level at 1 Meter, 1

**Watt Input, 200- to 4,000-Hz Average:**  
93 dB

### Maximum SPL at 1 Meter, 16 Watts

**Input, 200- to 4,000-Hz Average:**  
105 dB

### Voice-Coil Diameter:

25.4 mm (1.0 in.)

### Magnet Weight:

0.32 kg (0.72 lb)

### Magnet Material:

Barium Ferrite

### Flux Density:

1.0 Tesla

### Speaker Frame:

22-gauge stamped steel

### Frame Color:

Black

### Dimensions,

**Diameter,**

**407-8A, 407-8T, 407-16T:**

167 mm (6.6 in.)

**Height,**

**407-8A:**

62 mm (2.45 in.)

**407-8T, 407-16T:**

119 mm (4.70 in.)

### Net Weight,

**407-8A:**

1.0 kg (2.2 lb)

**407-8T, 407-16T:**

1.5 kg (3.3 lb)

### Shipping Weight,

**407-8A:**

1.2 kg (2.6 lb)

**407-8T, 407-16T:**

1.6 kg (3.5 lb)

### Transformer Input,

**407-8T, 407-16T:**

70.0- or 100-volt line

## Transformer Specifications

### Frequency Response:

65- to 15,000 Hz,  $\pm 3$  dB

### Insertion Loss:

<1.0 dB

### Secondary Impedance:

8 ohms

### Primary Impedances and Power Draw for 407-8T & 407-16T:

15708E	15716E
5,000 ohms	2,500 ohms
1.0 watts	2.0 watts
2,500 ohms	1,250 ohms
2.0 watts	4.0 watts
1,250 ohms	625 ohms
4.0 watts	8.0 watts
625 ohms	312 ohms
8.0 watts	16.0 watts

### Connection Type:

Eight-way barrier strip that will accept (2) #10 Gauge wires.

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