

# CS610/ CS610T

## Full-Range Loudspeaker

- High SPL capability
- Wide frequency response
- Ideal for music or voice reproduction
- Multiple transformer taps

### Description

The University Sound CS610 is a high-quality 6.5-inch, loudspeaker for distributed sound systems available in two versions: standard 8 ohm, (CS610) and 8 ohm with transformer (CS610T).

A curvilinear cone is used to improve high-frequency response dispersion.

The CS610 is suitable for use in applications requiring highly intelligible speech or smooth musical reproduction.

To ensure long-term reliability in installations, the CS610 is designed to handle 10-watts continuous power (40-watts peak) of shaped white noise for eight hours per ANSI/EIA RS-426-A 1980.

The CS610T includes a transformer, allowing connection to a 70.7-volt line, with taps of 0.25 to 4 watts.

### Directional Performance

The directional characteristics of the CS610 in a 1.8 cubic-foot vented enclosure were measured by running a set of polar responses in University Sound'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 2.

Additional typical data is provided in Figures 4 and 5, which indicate 6-dB-down beamwidth versus frequency and directivity factor, respectively, for a CS610 in the test enclosure.

### Power-Handling Test

The CS610 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 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 10 watts into the EIA equivalent impedance (8.6 volts true RMS). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 40-watts peak (17.2-volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

### Recommended Connections

The CS610 is a nominal 8-ohm impedance loudspeaker with a 10-watt input capability. The CS610T utilizes a 4-watt, 70.7-volt universal line-matching transformer with power taps ranging from 0.25 to 4.0 watts. The rating of these taps are shown in Table 1. In order to use these units with 100-volt lines, connect to the 70.7-V primary winding and refer to Table 1 for the appropriate taps. The 4-watt tap should not be used.

All transformers are mounted to the speaker and the primary winding is accessible to the user. All wattages marked for the various taps refer to the load on the amplifier, with the insertion loss of the transformer being less than 1.0 dB.

### Recommended Enclosures and Baffles

The CS610 and CS610T are designed to fit on standard 6.5-inch ceiling speaker baffles.

	70 V	100 V
0.25 W	Green	n/a
0.5 W	Yellow	Green
1.0 W	Orange	Yellow
2.0 W	Red	Orange
4.0 W	Brown	Red
8 ohms	White	White
Common	Black	Black

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Additionally, these loudspeakers will accommodate the use of any standard back enclosure with a diameter of 173 mm (6.8 in.) or greater and depth of at least 114 mm (4.5 in.). Larger back volumes will increase the low-frequency output. The frequency response of a CS610 in typical 0.5-cubic-foot enclosure is shown in Figure 1.

### Mounting

The CS610 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 6. Normal fasteners up to 5 mm (0.20 in.) will fit through the eight holes in the frame. The CS610 is designed for mounting on standard ceiling speaker baffles.

### Architects' and Engineers' Specifications

The unit 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 CS610 and 119 mm (4.70 in.) for the CS610T and shall weigh no more than 1.0 kg (2.2 lb) for the CS610 and 1.4 kg (3.1 lb) for the CS610T. 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 Hz and 12,000 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 ohms. The loudspeaker shall be capable of handling a continuous 10-watt (8.6 volts true RMS)

shaped white-noise signal (as per ANSI/EIA RS-462-A 1980) with a 6-dB crest factor for eight hours.

The loudspeaker shall be the University Sound model CS610. When fitted with a transformer that allows connection to 70.7-, 100-volt systems with power taps from 0.25 to 4 watts, the loudspeaker shall be referred to as the University Sound model CS610T.

### Uniform Limited Warranty Statement

University Sound 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 10500 W. Reno Avenue, Oklahoma, OK 73127 (800/845-8727 or FAX 405/577-3274). **Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. University Sound 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.

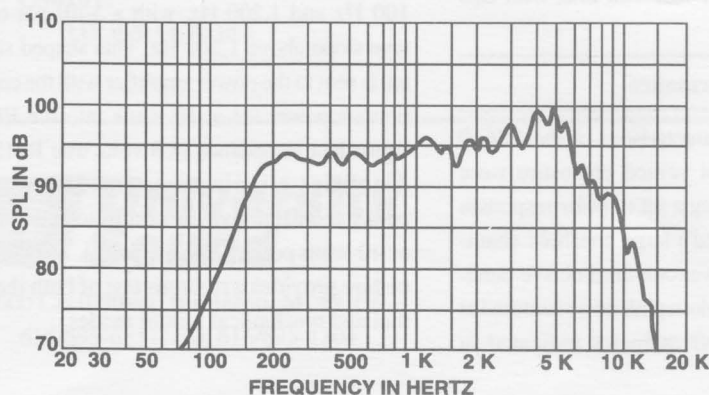
**University Sound Speakers and Speaker Systems** are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage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

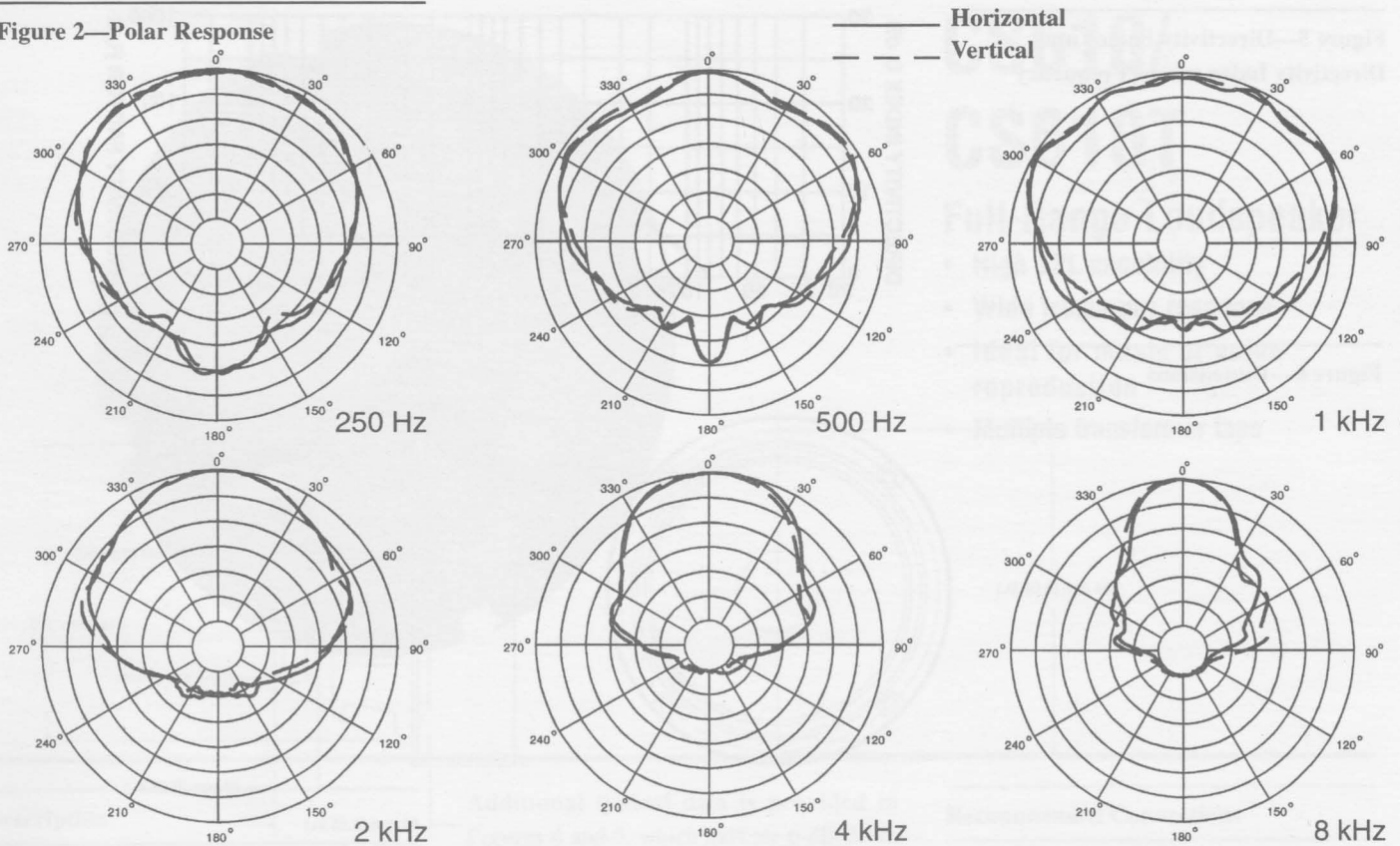
Specifications subject to change without notice.

Figure 1—Frequency Response



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Figure 2—Polar Response



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Figure 3—Impedance

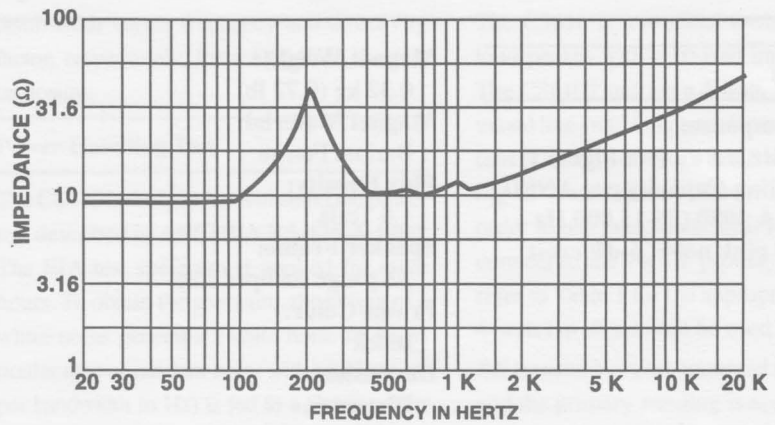
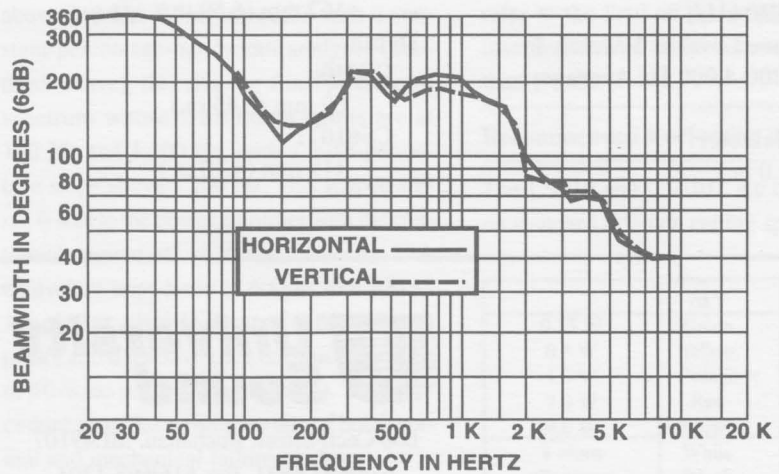


Figure 4—Beamwidth versus Frequency





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Figure 5—Directivity Factor and Directivity Index versus Frequency

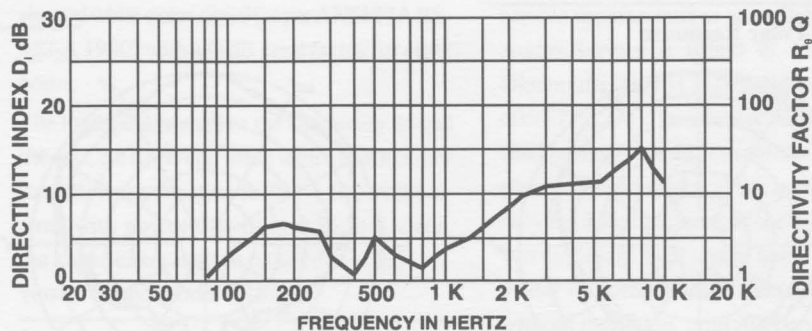
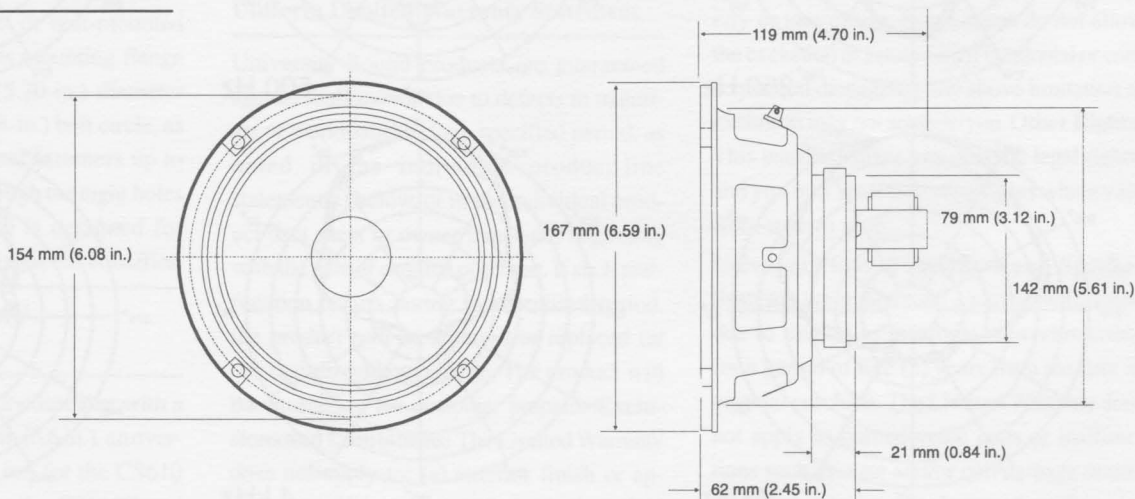


Figure 6—Dimensions



## Specifications

### Frequency Response:

95-12,000 Hz,  $\pm 5$  dB (see Figure 1)

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

10 watts

### Impedance,

**Nominal:**

8 ohms

**Minimum:**

7 ohms (230 kHz)

**Sound Pressure Level at 1 Meter, 1**

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

93 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,**

**CS610, CS610T:**

167 mm (6.59 in.)

**Depth,**

**CS610:**

62 mm (2.45 in.)

**CS610T:**

119 mm (4.70 in.)

**Net Weight,**

**CS610:**

1.0 kg (2.2 lb)

**CS610T:**

1.4 kg (3.1 lb)

**Shipping Weight,**

**CS610:**

1.2 kg (2.6 lb)

**CS610T:**

1.5 kg (3.3 lb)

**Transformer Input,**

**CS610T:**

70.7- volt line (100-volt option)



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