

# CS810 CS810T CS810TWB

## Full-Range Loudspeakers

- 10 watts RMS
- 40 watts peak
- WB version includes premounted ceiling grilles
- High SPL (94 dB, 1 watt, 1 meter)
- Multiple transformer taps
- Wide dispersion

### Description

The University Sound CS810 is a high-quality 8-inch, full-range loudspeaker for distributed sound systems.

An acoustically transparent dome encloses a small, centrally mounted free-edge cone which is used to improve high-frequency dispersion.

The CS810 is suitable for use in applications requiring highly intelligible speech or smooth musical reproduction.

To ensure long-term reliability in installations, the CS810 is designed to handle 10 watts continuous power (40 watts peak) of shaped white noise signal for eight hours per EIA RS-426-A 1980.

The CS810T includes a transformer, allowing connection to 70 volt line, with taps of 0.25 to 4 watts. The CS810TWB offers the same performance as the CS810T but features a baffle.

### Directional Performance

The directional characteristics of the CS810 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 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 CS810 in the test enclosure.

### Power Handling Test

The CS810 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 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 CS810 is a nominal 8-ohm impedance loudspeaker with a 10-watt input capability. However, it is also available with transformer, the CS810T, and with transformer and baffle, the CS810TWB.

The CS810T utilizes a 4-watt, 70.7-volt universal line matching transformer with power taps ranging from 0.5 to 4 watts as indicated in Table 1. 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-volt

Table 1	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 Common	White Black	White Black

primary winding, and use Table 1 above to determine the wattage ratings of the various secondary winding taps. Do not use the tap marked 4 W.

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All wattages marked for the various taps refer to the load on the amplifier, with the insertion loss of the transformer being less than 1.5 dB.

## Recommended Enclosures and Baffles

CS810 and CS810T are designed to fit on standard 8-inch ceiling speaker baffles. Additionally, the CS810, CS810T and CS80TWB loudspeakers will accommodate the use of any standard back enclosure with a diameter of 8.6 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 CS810 in a typical 0.25-cubic-foot and 1.8-cubic-foot back enclosure are shown in Figure 1.

## Mounting

The CS810 may be front- or rear-mounted against either surface of its mounting flange and requires a 184 mm (7.25 in.) diameter

cutout and a 195 mm (7.68 in.) bolt circle. Normal fasteners up to 5 mm (0.20 in.) will fit through the eight holes in the frame. The CS810 is designed for mounting on standard ceiling speaker baffles.

## Architects' and Engineers Specifications

The loudspeaker shall be a dual-cone loudspeaker with a nominal diameter of 206 mm (8.1 in.), an overall depth of 70 mm (2.75 in.), and shall weigh no more than 1.0 kg (2.2 lb). The voice coil shall have a nominal diameter of 25.4 mm (1.0 in.) and depth of 7.6 mm (0.3 in.) and shall operate in a gap of not less than 1.0 T (10,000 Gauss). High frequencies shall be reproduced by 57 mm (2.2 in.) free-edge cone attached to the apex of the low-frequency device and protected from dust by a dust dome fastened to the low-frequency cone.

The loudspeaker shall exhibit a sensitivity (SPL, 1 W at 1 m (3.28 ft) averaged 200-4,000 Hz) of no less than 94 dB on axis maintaining an essentially flat frequency response with 3-dB-down points at 115 Hz and 12,000 Hz in a 12-cubic-foot sealed box in a free field. The half-space reference efficiency shall be 1.9%. The nominal impedance shall be 8 ohms and the dc resistance shall be 6.5 ohms. The loudspeaker shall be capable of handling a continuous 10-watt (8.6 volts true RMS) shaped white-noise signal (as per EIA RS-426A 1980) with a 6-dB crest factor for eight hours.

The loudspeaker shall be the University Sound model CS810. When fitted with a

transformer that allows connection to 70.7-volt systems of 0.25 to 4 watts, the loudspeaker shall be referred to as the University Sound model CS810T and the CS810TWB with transformer and baffle.

## Warranty (limited)—

University Sound Loudspeakers and Loudspeaker Systems (excluding active electronics) are guaranteed for five years from date of original purchase against malfunction due to defects in workmanship and materials. If such malfunction occurs, unit will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to University Sound. Unit will be returned prepaid. Warranty does not extend to finish, appearance items, burned coils, or malfunction due to abuse or operation under other than specified conditions, including cone and/or coil damage resulting from improperly designed enclosures, no does it extend to incidental or consequential damages, so the above exclusion may not apply to you. Repair by other than University Sound will void this guarantee. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

For warranty repair, device information or a listing of the repair facilities nearest you contact the service repair department at: 800/845-8727, FAX: 405/577-3274.

For technical assistance, call: 800/234-6831. Specifications subject to change without notice.

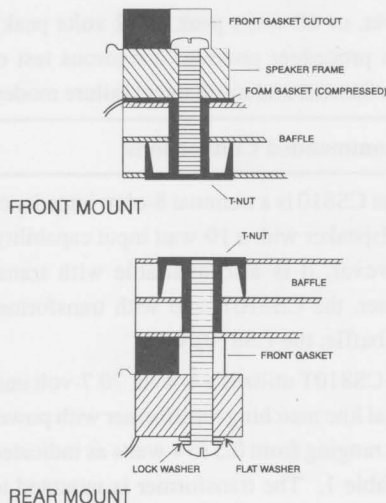
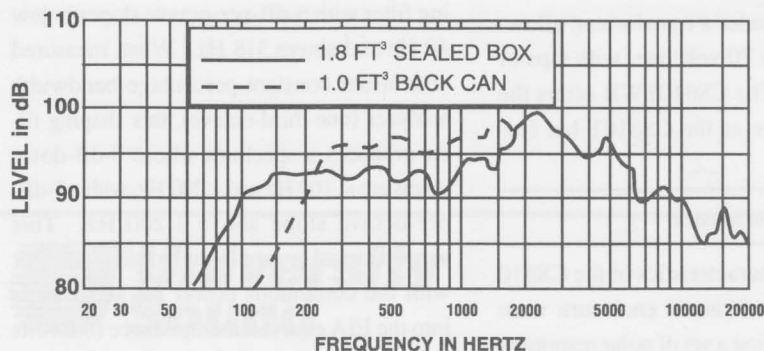


Figure 1—Axial Frequency Response, 1 Watt/ 1 Meter



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Figure 2—Input Impedance vs. Frequency

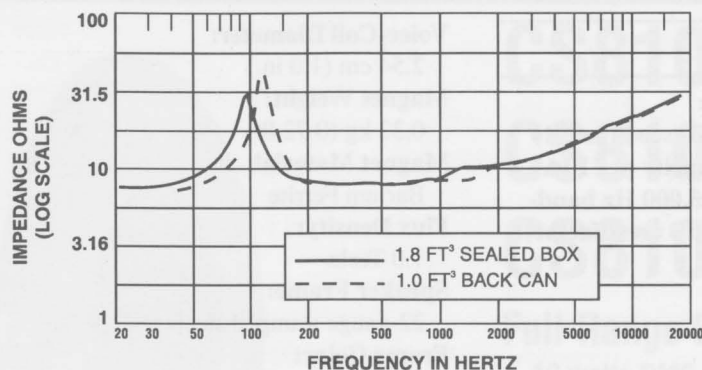


Figure 3—CS810 Polar Response in 1.8 ft<sup>3</sup> Sealed Box 4-Volt RMS of 1/3-octave-Band Limited Noise in Anechoic Environment, 20 Feet on Axis (5 dB per Division)

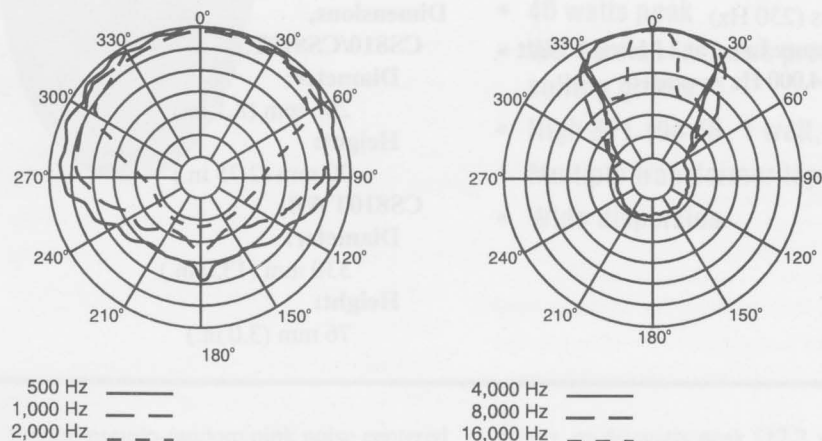


Figure 4—CS810 Beamwidth vs. Frequency in 1.8 ft<sup>3</sup> Sealed Box

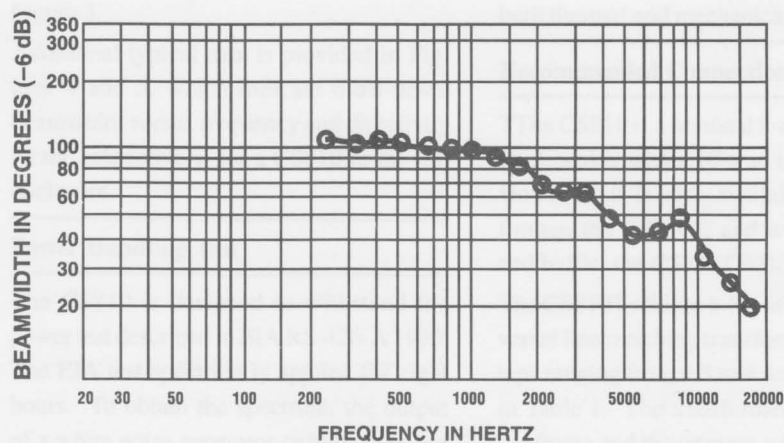
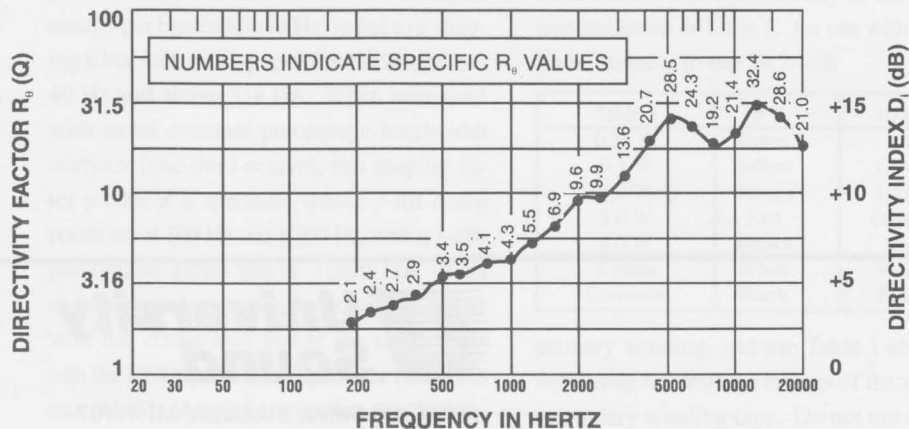


Figure 5—CS810 Directivity Factor and Directivity Index vs. Frequency in a 1.8 ft<sup>3</sup> Sealed Box



## CS810/CS810T/CS810TWB Full-Range Loudspeaker

### Specifications

#### Frequency Response:

80-15,000 Hz,  $\pm 5$  dB (see Figure 1)

#### Power-Handling Capacity per EIA

RS-426-A 1980 (80-15,000 Hz band-limited pink noise, 6-dB crest factor):

10 watts

#### Impedance,

##### Nominal:

8 ohms

##### Minimum:

7 ohms (230 Hz)

#### Sound Pressure Level at 1 Meter, 1 Watt

#### Input, 200-4,000 Hz Average:

94 dB

#### Voice-Coil Diameter:

2.54 cm (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,

##### CS810/CS810T,

##### Diameter:

206 mm (8.1 in.)

##### Height:

70 mm (2.75 in.)

##### CS810TWB,

##### Diameter:

330 mm (13.0 in.)

##### Height:

76 mm (3.0 in.)

#### Net Weight,

CS810: 1.0 kg (2.2 lb)

CS810T: 1.4 kg (3.0 lb)

CS810TWB: 1.6 kg (3.59 lb)

#### Shipping Weight,

CS810: 1.3 kg (2.9 lb)

CS810T: 1.7 kg (3.7 lb)

CS810TWB: 1.9 kg (4.1 lb)

#### Transformer Input ,

##### (CS810T):

70.7 (100-volt option)



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