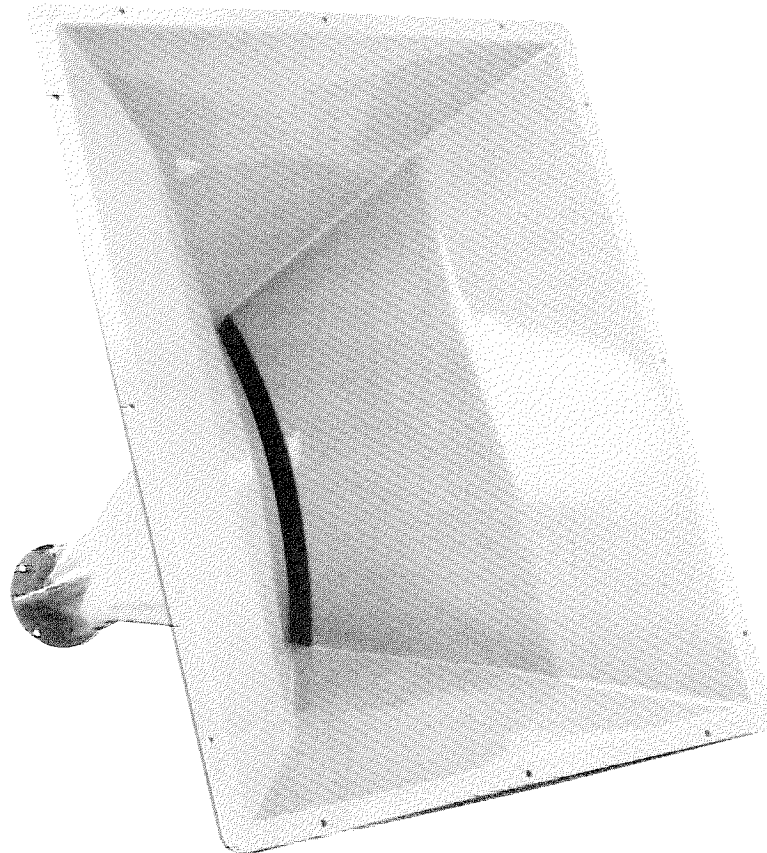




# MR945A CONSTANT DIRECTIVITY HORN



## DESCRIPTION

The ALTEC LANSING **MR945A** is a mid/high frequency horn with excellent directivity control over the full frequency range from 500 Hz to 16 kHz.

The **MR945A** is a member of a family of constant directivity horns using the latest design concepts. The geometry of the **MR945A** minimizes the problem of high frequency beaming and maintains uniform dispersion at all frequencies within the rated bandwidth of the horn. The large height dimension of the horn mouth guarantees good vertical directivity control and proper acoustic loading to a low frequency of 500 Hz.

The total directivity performance of the **MR945A** can be seen in its polar patterns which exhibit a uniform dispersion angle and directivity index at all frequencies from 500 Hz to 16 kHz. The hor-

izontal and vertical off axis frequency response curves also demonstrate smooth response characteristics everywhere within the rated coverage pattern of the horn.

The horn is constructed of polyester resin and fiberglass with a die cast zinc throat and mounting flange molded in to form a single unit. Dampeners are laminated into the throat and mouth sections to reduce panel resonances in the operating range of the horn. This type of construction results in a horn that is lightweight, strong, and nonresonant. The 1.4 inch throat and mounting bolt pattern accept Altec Lansing large format compression drivers. Holes for mounting or hanging the horn are provided in the front flange and in the throat section near the driver attachment flange.

**SPECIFICATIONS**

**Horizontal Dispersion Angle:** 90° (+12°, -21°) 500 Hz to 16 kHz (See Figure 6)

**Vertical Dispersion Angle:** 40° (+14°, -1°) 500 Hz to 16 kHz (See Figure 6)

**Mean Directivity (Q):** 15.0 (+5.7, -4.7) 500 Hz to 16 kHz (See Figure 7)

**Mean Directivity Index (DI):** 11.0 dB (+1.1 dB, -0.9 dB) 500 Hz to 16 kHz (See Figure 7)

**Useable Low Frequency Limit:** 500 Hz (See Figures 1, 2)

**Frequency Response:** 500 Hz - 16 kHz (See Figures 1, 2)

**Pressure Sensitivity:** dB SPL, 500 Hz - 3.15 kHz (See Note 1)

Driver	Input Power	1 Meter	4 Feet
288-L	1 watt	112	110
	20 watts	125	123
290-L	1 watt	110	108
	120 watts	130	128
291-L	1 watt	111	109
	50 watts	127	125
299-A	1 watt	112	110
	50 watts	128	126
906-A	1 watt	112	110
	40 watts	127	125

**Construction:** Polyester resin and fiberglass with integral die cast zinc throat and dampening panels

**Finish:** Polyester gelcoat in four available colors

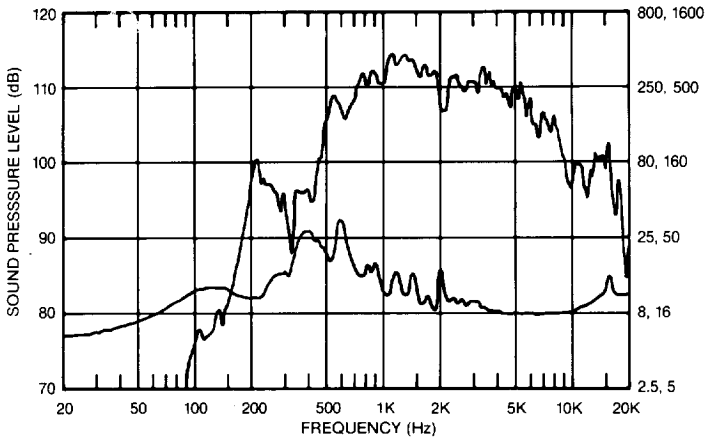
**Dimensions:** 26.8 in (67.9 cm) wide  
32.0 in (81.3 cm) high  
32.7 in (83.0 cm) deep

**Net Weight:** 26 lb (11.8 kg)

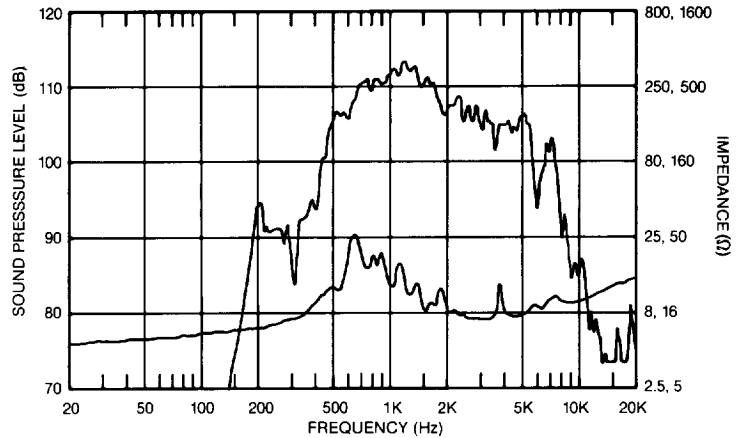
**Shipping Weight:** 37 lb (16.8 kg)

**Driver Mounting Data:** Four .406 in (1.03 cm) holes on a 4.75 in (12.07 cm) diameter bolt circle

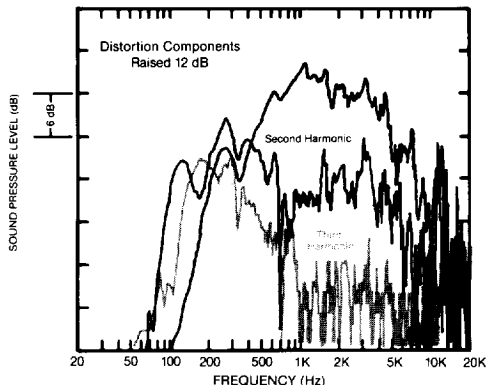
**Recommended Drivers:** Altec Lansing 288-L types  
290-L types  
291-L types  
299-A types  
906-A types



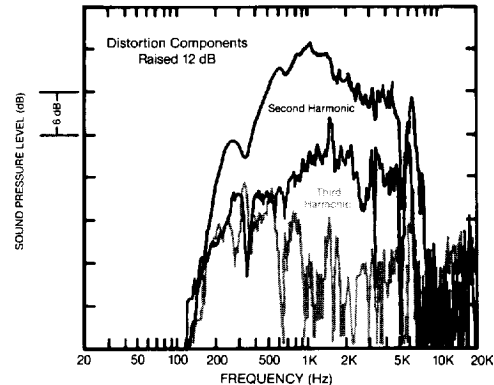
**Figure 1. Frequency Response and Magnitude of Impedance with 299-A Driver (See Note 2)**



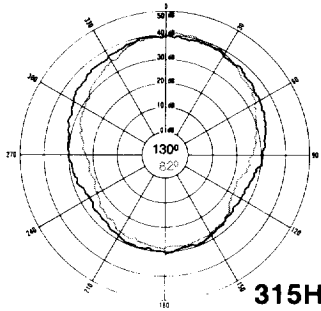
**Figure 2. Frequency Response and Magnitude of Impedance with 290-L Driver (See Note 2)**



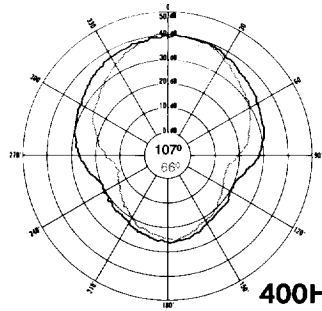
**Figure 3. Harmonic Distortion at 0.1 Rated Power (299-A Driver, 5 watts, See Note 3)**



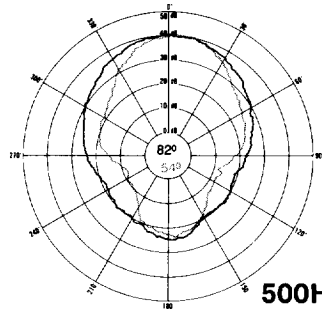
**Figure 4. Harmonic Distortion at 0.1 Rated Power (290-L Driver, 12 watts, See Note 3)**



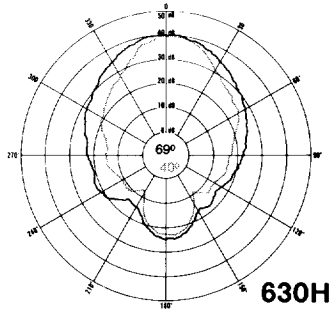
**315Hz**



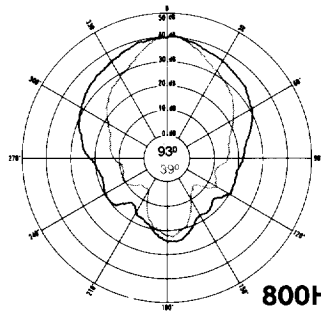
**400Hz**



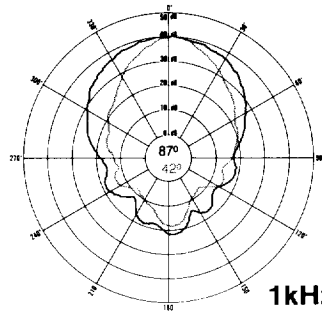
**500Hz**



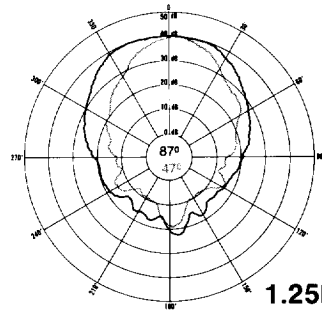
**630Hz**



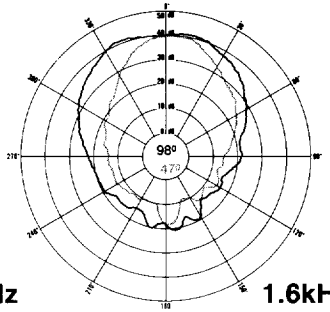
**800Hz**



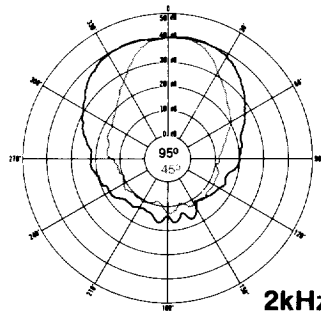
**1kHz**



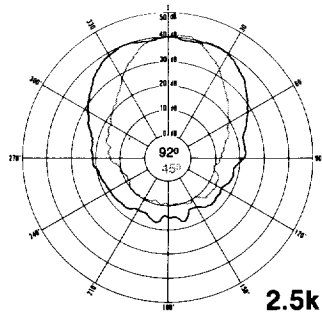
**1.25kHz**



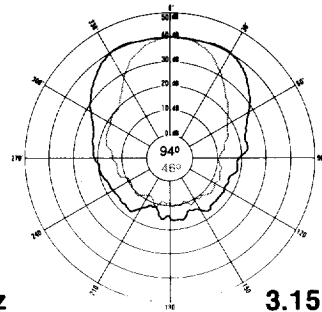
**1.6kHz**



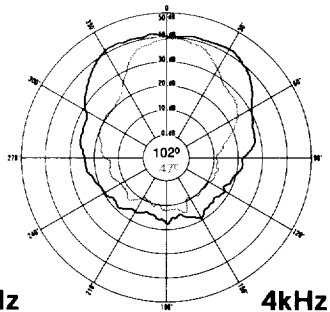
**2kHz**



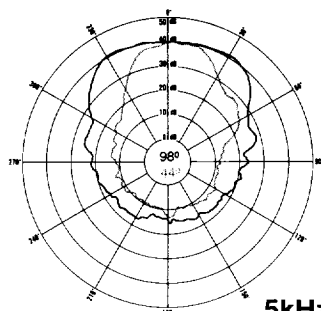
**2.5kHz**



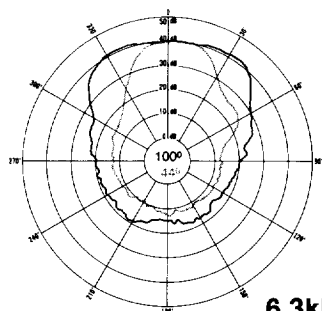
**3.15kHz**



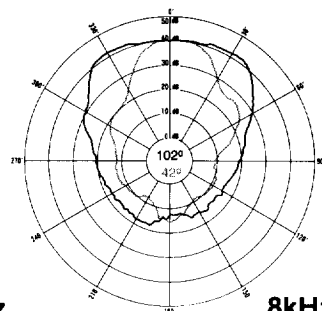
**4kHz**



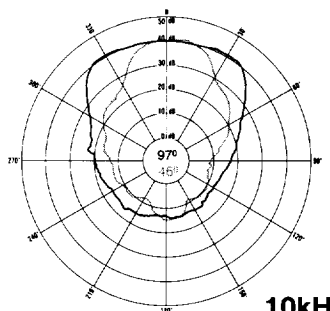
**5kHz**



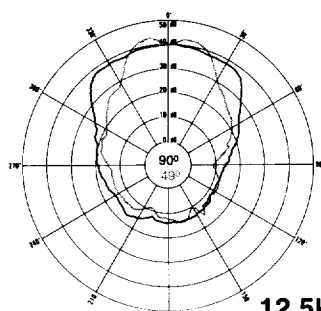
**6.3kHz**



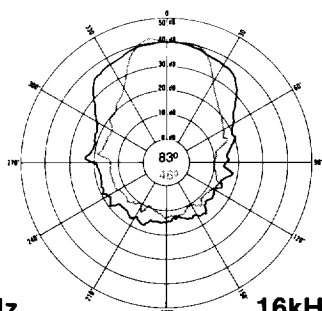
**8kHz**



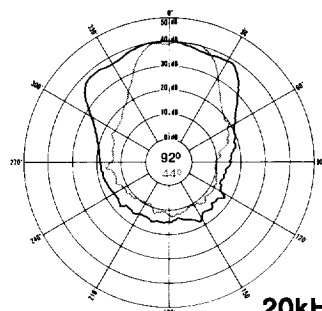
**10kHz**



**12.5kHz**



**16kHz**



**20kHz**

**5. Polar Response Charts  
(using 1/3 octave  
bands of pink noise)**

**HORIZONTAL**

**VERTICAL**

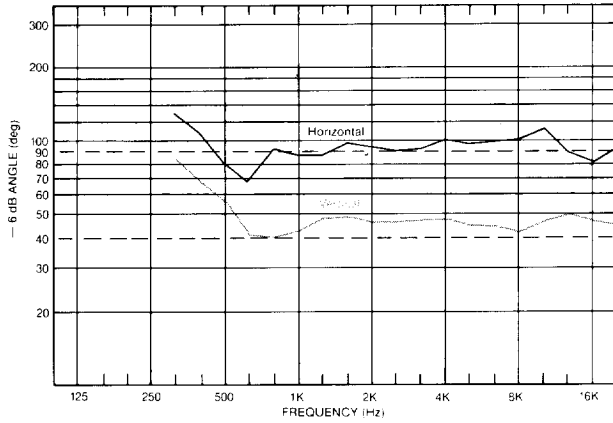


Figure 6. Dispersion Angle

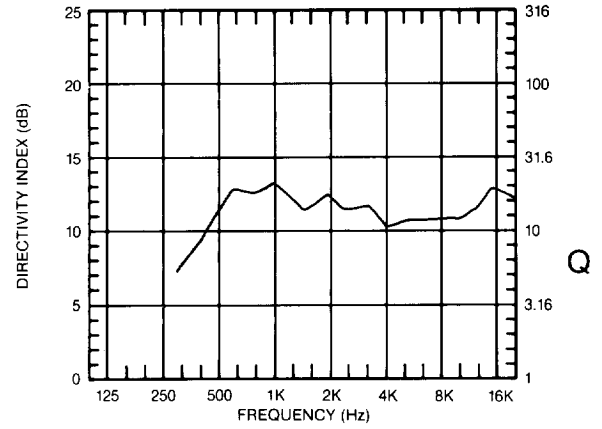


Figure 7. Q and Directivity Index

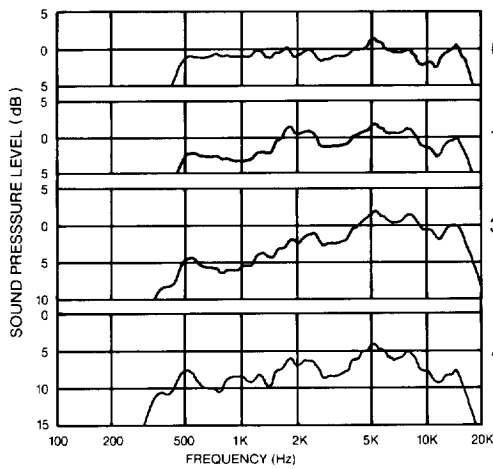


Figure 8. Horizontal Off Axis Frequency Response (See Note 4)

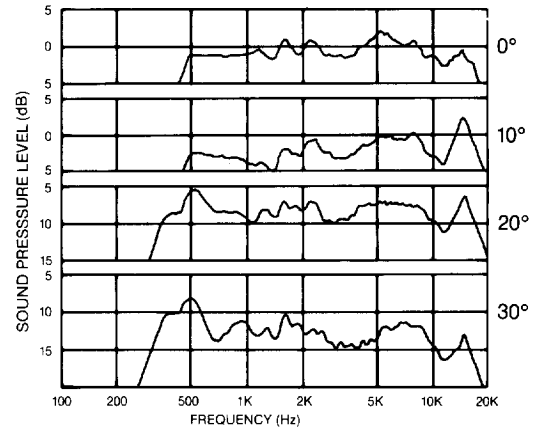


Figure 9. Vertical Off Axis Frequency Response (See Note 4)

#### NOTES ON MEASUREMENT CONDITIONS

1. On axis, pink noise signal, power calculated using  $E^2/Z_{min}$ , 3.16 meter measurement distance from horn mouth referred to one meter.
2. On axis, one watt calculated using  $E^2/Z_{min}$ , 3.16 meter measurement distance from horn mouth referred to one meter.
3. Distortion components invalid above 10 kHz. The

percentage distortion of a harmonic at given frequency may be found by graphically taking the difference between the fundamental and harmonic, adding 12 dB, and applying the formula:

$$\text{percentage distortion} = 100 \times 10^{-\text{dB change}/20}$$

4. On axis frequency response has been equalized. Horn has been rotated around the apparent apex.

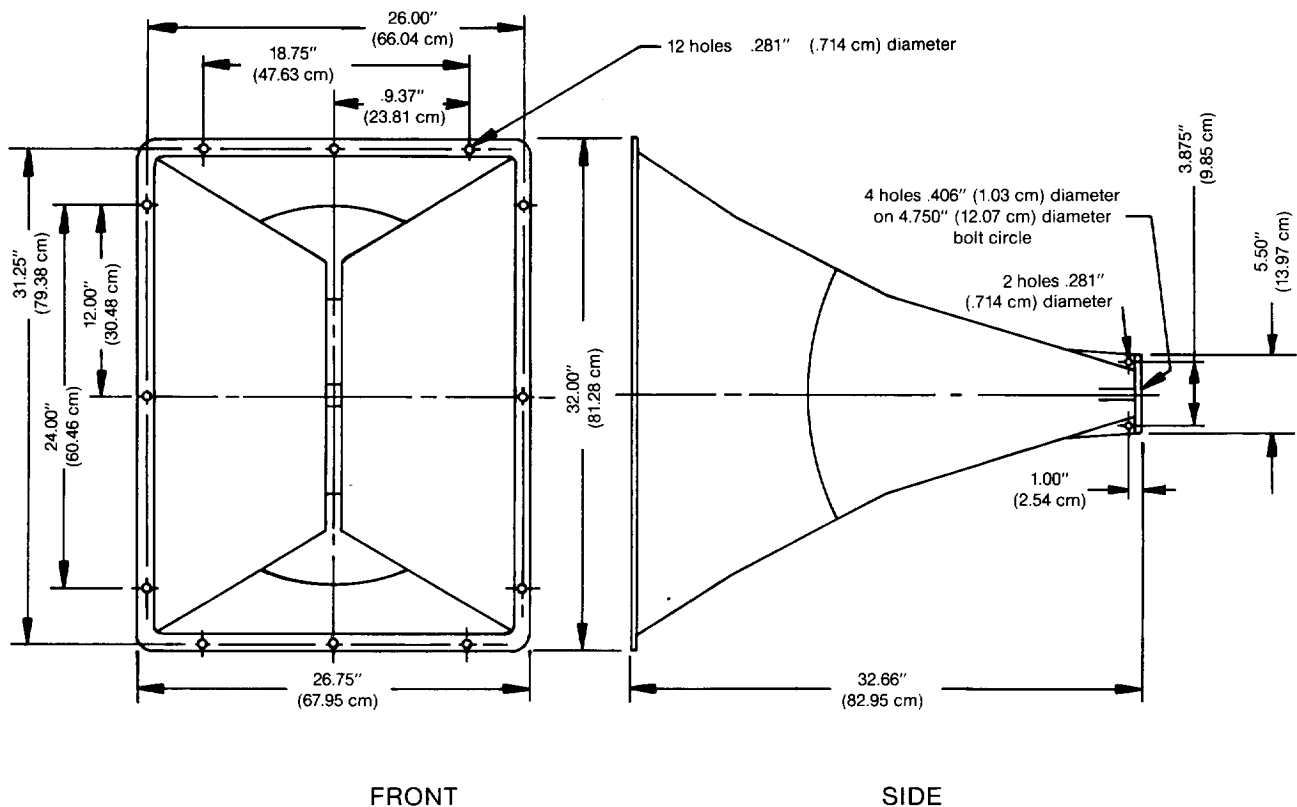


Figure 12. Mounting Information and Dimensions

**REFERENCE LITERATURE**

"The Mantaray Horns," C.A. Henricksen and M. Ureda, *J. Audio Eng. Soc.*, vol. 26, p 629-634 (1978 Sept.)

(Abstracts), vo. 26, p 988 (1978 Dec.)

"Apparent Apex Theory: Far-Field Polar Characteristics at Close Proximity," M. Ureda, *J. Audio Eng. Soc.*

"Coverage of Multiple Mantaray Horns," M. Ureda and T. Uzzle, *Tech Letter #262*, Altec Lansing

**ARCHITECT'S AND ENGINEER'S SPECIFICATIONS**

The loudspeaker shall be a directivity control mid/high frequency horn. It shall be of heavy duty polyester resin and fiberglass molded construction. The horn shall meet the following performance criteria over the bandpass of 500 Hz to 16kHz. Horizontal dispersion angle 90° (+12°, -21°). Vertical dispersion angle 40° (+14°, -1°). The horn shall provide a proper acoustic load to a compression driver down to 500 Hz. Pressure sensitivity shall be 112 dB SPL at one meter on axis with one watt

(E<sup>2</sup>/Z<sub>min</sub>) input of band limited pink noise from 500 FHz to 3.15 kHz applied to an attached Altec Lansing 299-A type compression driver. The horn shall be 26.8 in (67.9 cm) wide by 32.0 in (81.3 cm) high by 32.7 in (83.0 cm) deep and shall weigh 26 lb (11.8 kg).

The loudspeaker shall be the Altec Lansing Model **MR945A**.