There are other shapes[5] besides the cylinder, cube, and sphere that are used for microphone and loudspeaker enclosures. In order to provide additional information, the diffraction of sound by the shapes shown in Fig. 1.9 were obtained experimentally. The dimensions of the ten different
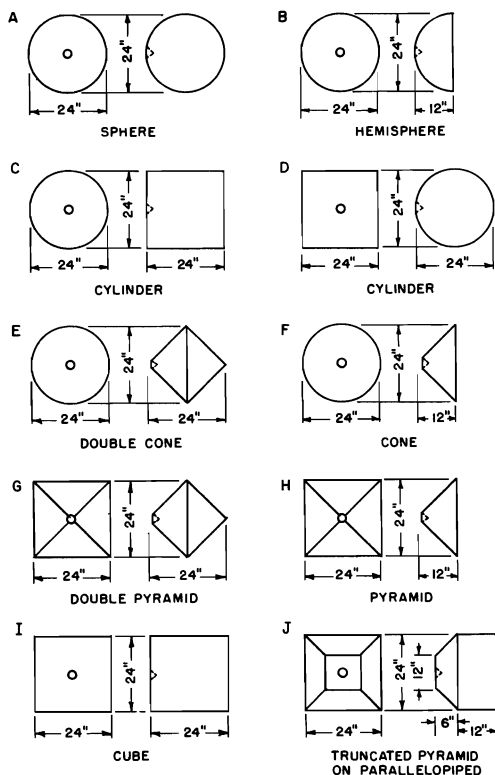

FIG. 1.9. Structures used in sound diffraction studies.

enclosures are shown in Fig. 1.9. The experimentally-determined diffraction of a sound wave by these different enclosures was obtained by comparing the response of a small loudspeaker in free space with the response of the loudspeaker mounted in the enclosures in the position shown in Fig. 1.9. The diameter of the diaphragm of the cone used in the loudspeaker was $\frac{7}{8}$ inch. Since the upper frequency limit of the response was made 4000 cycles, the diameter of the cone is less than one-quarter wavelength. In other words the source is for all practical purposes nondirectional. The diffraction characteristics for the ten shapes are shown in Fig. 1.10. The response frequency characteristics shown in Fig. 1.10 are for the dimensions shown in Fig. 1.9. The response frequency characteristics

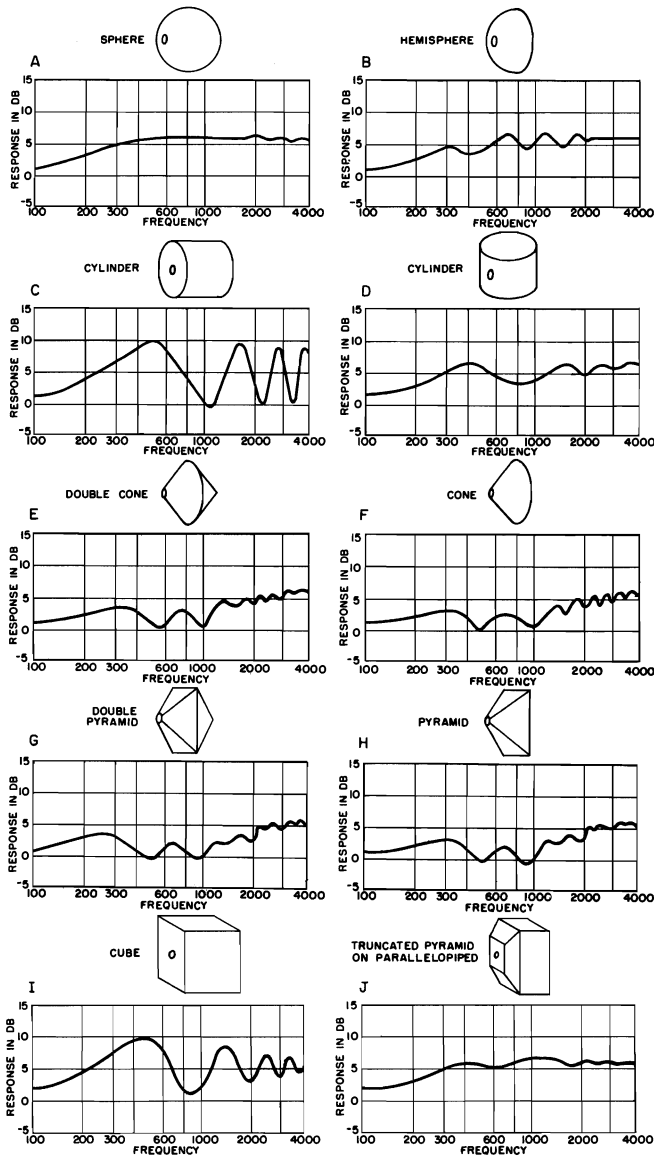[5] Olson, H. F., *Audio Eng.*, Vol. 35, No. 11, p. 34, 1951.

FIG. 1.10. Response frequency characteristics depicting the diffraction of sound by ten objects of different shapes. The dimensions of the objects are given in Fig. 1.9.

for enclosures of other dimensions can be obtained by multiplying the ratio of the linear dimensions of the enclosure of Fig. 1.9 to the linear dimension of the enclosure under consideration by the frequency of Fig. 1.10.