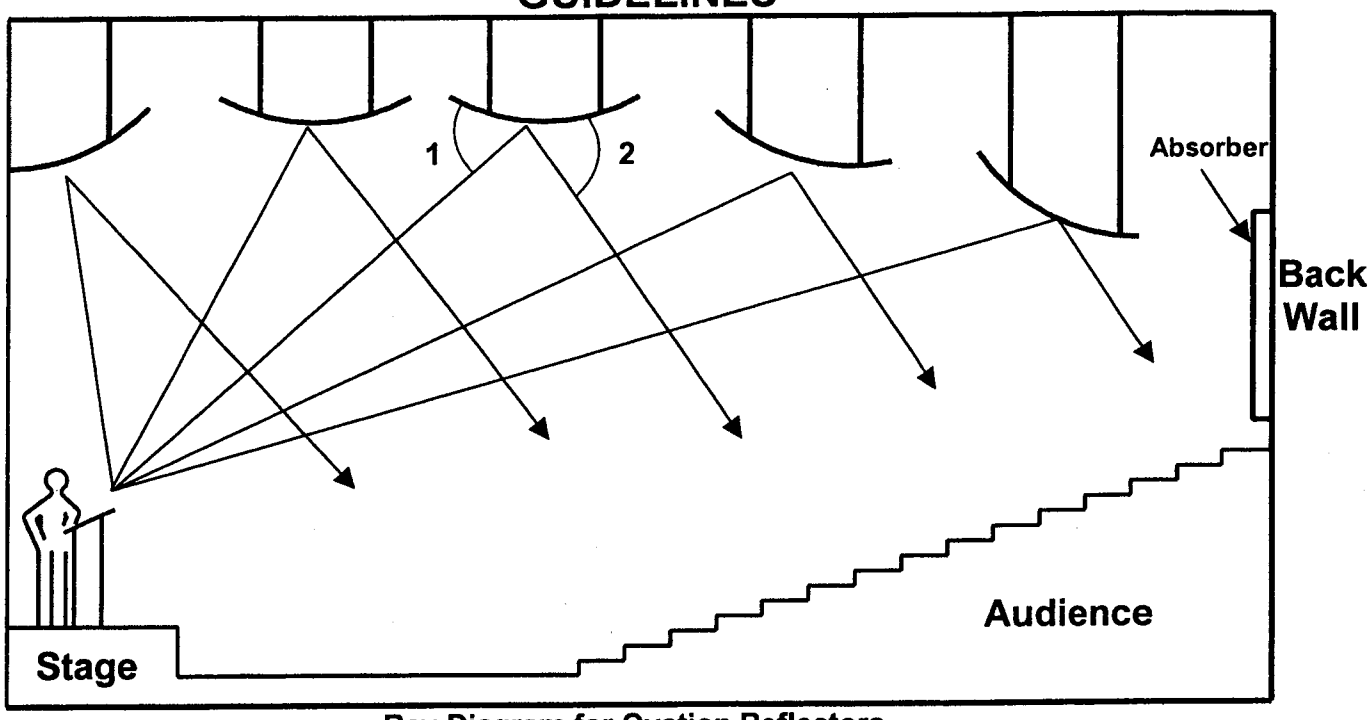
OVATION ACOUSTICAL REFLECTORS DESIGN, LAYOUT GUIDELINES



Ray Diagram for Ovation Reflectors

Coverage

The reflector panel layout, elevation and coverage area is critical to the performance of the space and the effectiveness of the overhead reflectors. A minimum percentage of coverage area would be 50% of the ceiling from the front of the stage to the rear wall of the auditorium. The maximum recommended coverage would be 70%. Open spaces between reflectors allow for coupling of the air volume above and below the reflectors. This maintains the desired effect from the overall room volume of the auditorium. Panel layouts more dense than 70% will not allow for acoustical coupling and desirable room reverberation will suffer.

Panel Position

Design so the entire surface of each reflector is visible from the stage (source) area. Angle reflectors so that sound reflections are projected to the audience, with emphasis on middle and rear seating areas. The angle of incidence (1) equals the angle of reflection (2) for sound reflections (See Ray diagram). Bowed reflectors provide greater sound diffusion and are especially useful for music.

Panel Size

In regards to the size of the reflectors, we recommend the following. For speech programs, the minimum panel size should be 8 ft. x 8 ft., assuming that there are spaces between the panels. For musical performance, the panel size should be larger with minimums in the 10-12 ft. range for width and length. The reason for these size requirements is the nature of the various sound frequencies and the size of the sound waves being reflected. A sound wave of 250 Hz is almost 5 ft. in length and will easily move around smaller panels such as 4' x 6's or 4' x 8's. This is called sound diffraction and is not desirable where the goal is to reflect the sound with minimal energy loss to the audience. As sound waves become larger at low frequencies, particularly in music performance, larger panels are desirable.

Sound Absorption

Acoustical panels like Model Hardside may be recommended to control back wall or side wall reflections. Absorptive fiberglass batt on the backside of the reflectors (optional) also reduces reverberation levels. The services of a qualified acoustical consultant are recommended for overall acoustic and noise control design in music performance spaces.