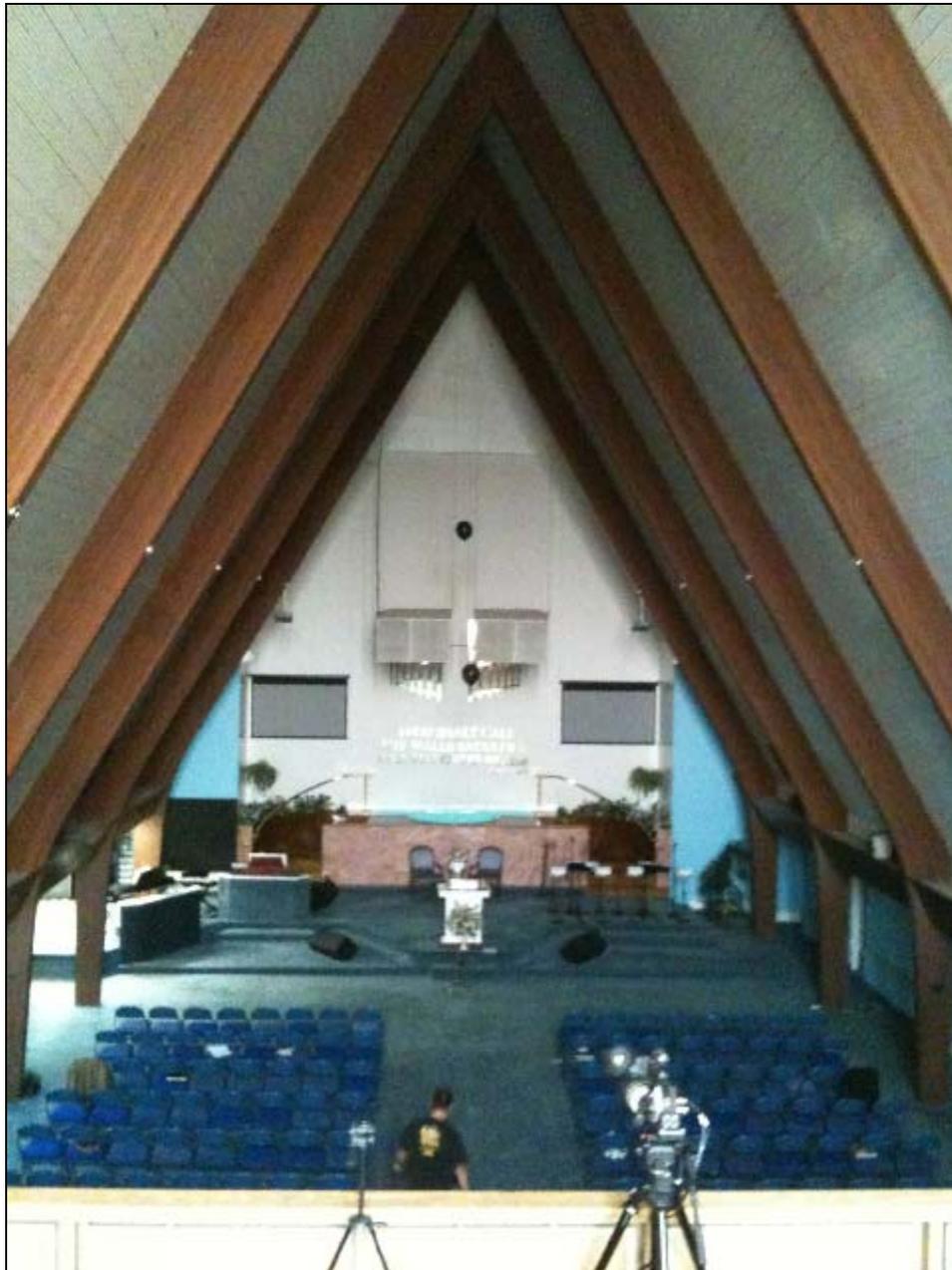


Three Balloon Tricks by Mike Akrep

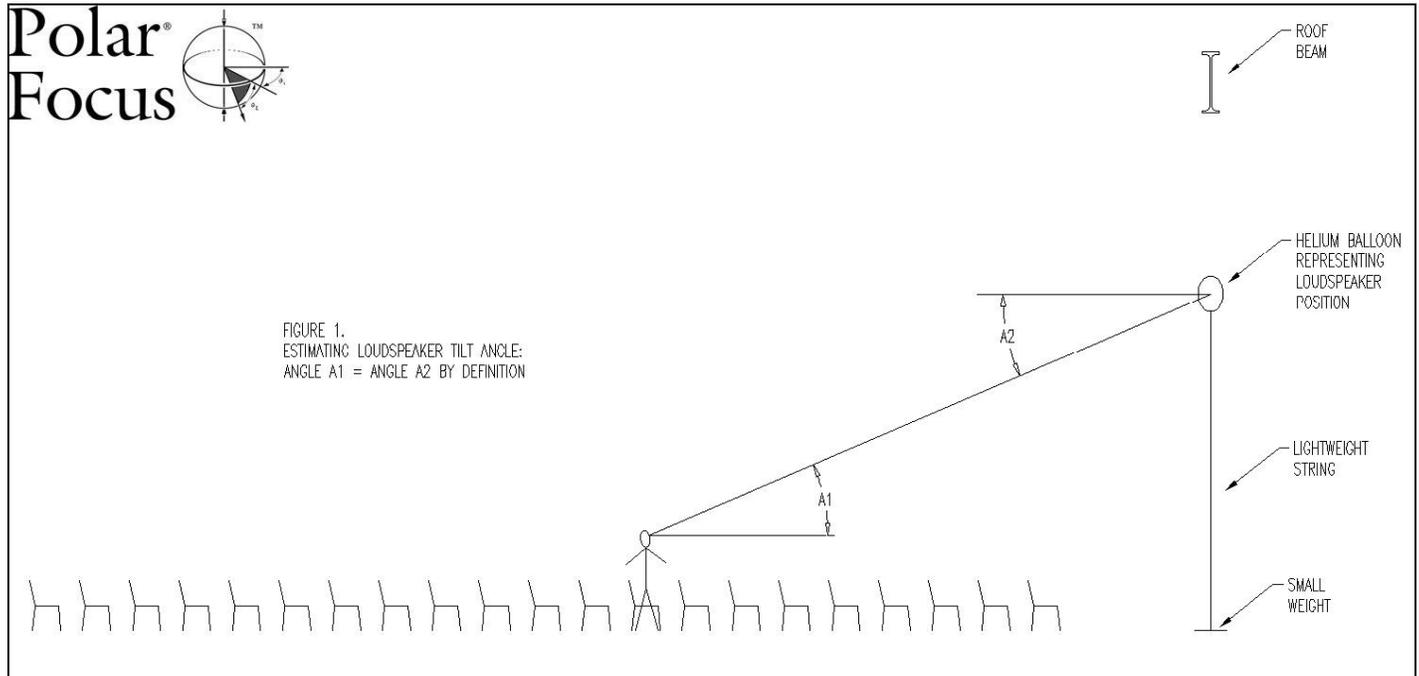
How do you check a sight line issue without building a large scaffolding? How do you calm a Minister of Music that the speaker you plan to install will not block the view of important stained glass? How do you measure the estimated vertical coverage angle diagonally through a building, when the architect doesn't supply a diagonal section? Use inexpensive helium balloons, lightweight string, and careful technique.



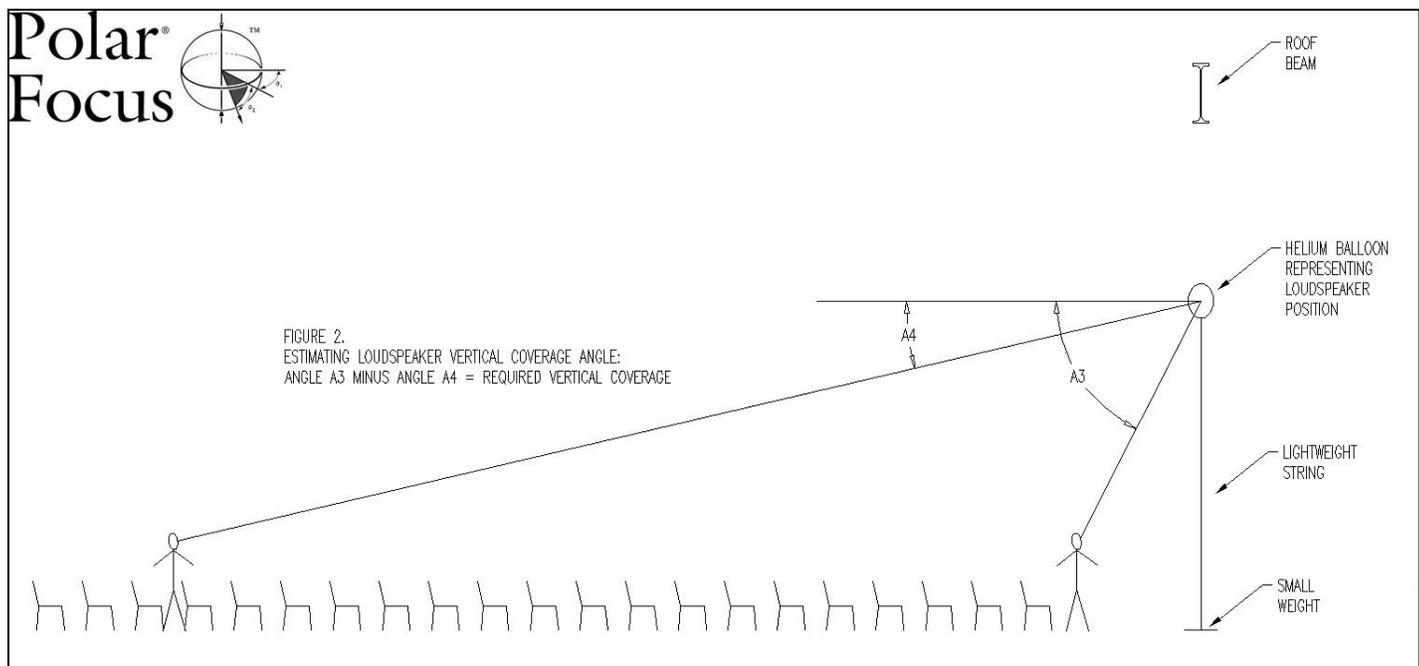
The first part of these techniques is to place a helium balloon in the room to define a proposed location for a loudspeaker. Helium balloons are available at floral shops, and in the floral section of most

supermarkets. You can use a single balloon each for the top and bottom of a line array as shown in the photograph above. In that image, you can see two black balloons defining a proposed line array position.

Figure 1 below shows how to measure the estimated tilt angle of a loudspeaker. While sitting in a seat where you would like the speaker to be focused, use an inclinometer and a straight edge to measure the vertical angle while aiming your straight edge at the balloon. The angle that you measure aiming up at the loudspeaker is the same as the angle of the loudspeaker focusing down at you.

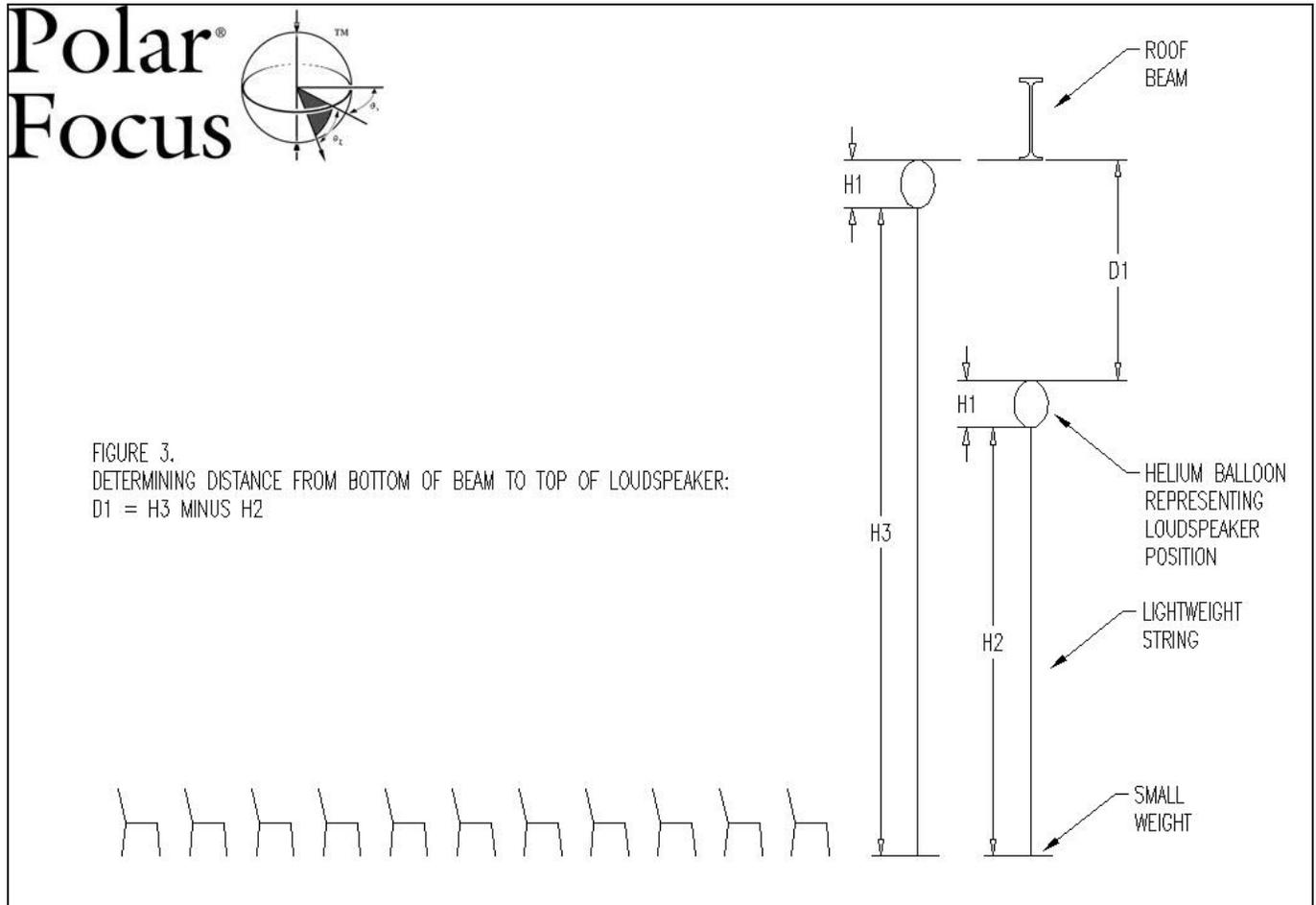


To measure the vertical coverage angle required in an audio installation, you'll need to perform two angular measurements and a subtraction. As shown in Figure 2 below, take an angular measurement



from the front row, another measurement from the back row, and then subtract.

Accurate loudspeaker installations frequently require knowing the distance from the bottom of a beam down to the top of the loudspeaker. However, most audio design consultants will provide drawings that only define the desired position of the loudspeaker above the finished floor. A third balloon trick solves this problem as shown in Figure 3 below.



After the loudspeaker position is defined, measure the length of the string H2. Float the balloon up until it just touches the bottom of the beam, then measure the string length H3. Subtract H2 from H3 to determine the distance from the bottom of the beam to the top of the loudspeaker. Adding dimensions H1 and H3 lets you confirm the height of the bottom of the beam above the finished floor.