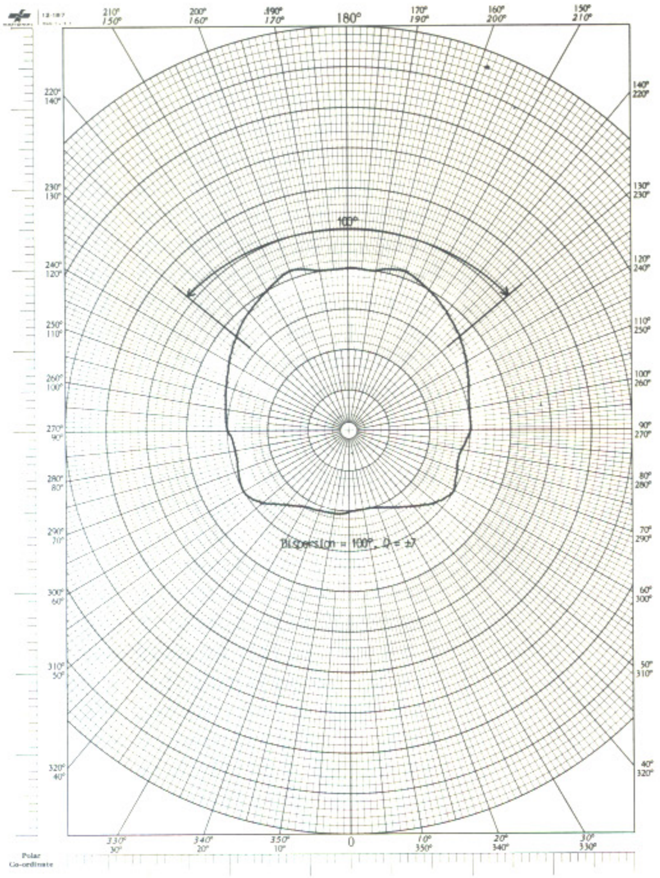

Figure 3A.

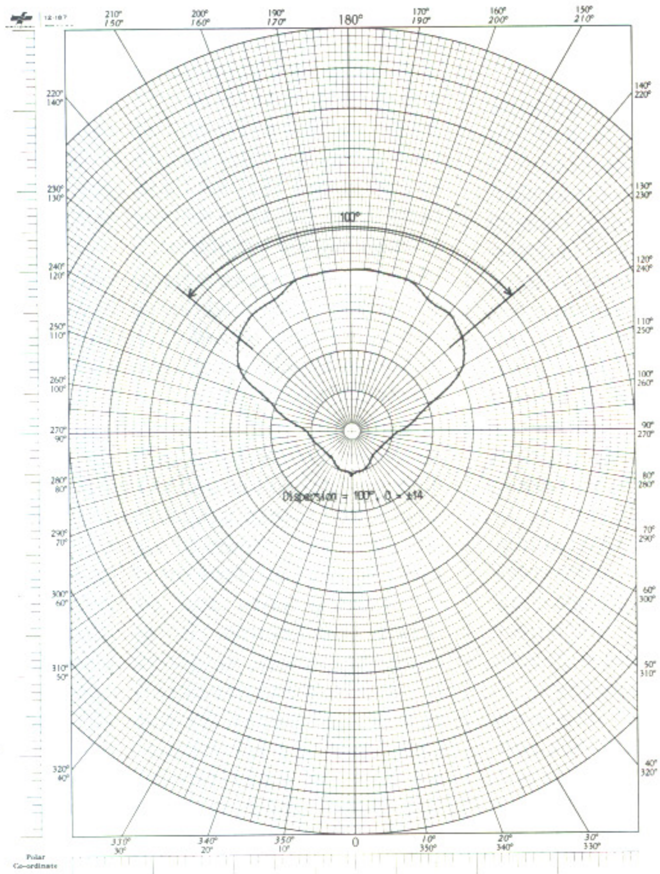

Figure 3B.

Secondly, the floor seating section would require only one of the existing 90 degree by 60 degree, Q = 6, horn and compression driver combinations. This would reduce the unwanted room reflections tremendously while maintaining adequate sound pressure level in the room. Again, the center axis of the horn should be aimed toward the center-rear section of the audience, once more taking advantage of the inverse square law.

Lastly, the two 15-inch woofers should be aimed in the direction of the floor seating horn. It is not necessary to aim additional woofers at the balcony seating section because the dispersion of lower frequency devices is inherently very wide and will sufficiently cover both the balcony and floor seating sections; see appendix 1-1.

After reviewing the effects of sound source dispersion and directivity factor it is obvious that they are an imperative part of sound reinforcement system design. When these two concepts are applied correctly by the sound system designer the benefits are immense. For the sound contractor the cost of the sound reinforcement system will be reduced thereby giving the contractor a larger profit margin and a lower bid. For the client, an installation that meets or exceeds all performance specifications is achieved at a reduced cost which will result in satisfaction and future referrals to the contractor. Sound source dispersion and directivity factor are not to be taken lightly.

APPENDIX 1-0

Inverse square law rate of level change.

This law describes the geometric expansion of sound from a sound source. The change in level for a spherical expansion from a point sound source is approximately 6 dB for each doubling of the distance. However, the reverberant field indoors is relatively constant, and therefore must be taken into consideration.

loss in dB-SPL at the measurement point,

where: $$r = 10 \log \left[\frac{Q}{4\pi r^2} + \frac{4}{R} \right]$$

r is the distance to the measurement point