

Field Probe Measurements and Stray Signal Evaluation of a
Spherical Near-Field Range

Doren W. Hess
Scientific-Atlanta, Inc.

Just as with far-field or compact ranges, it is important to evaluate spherical near-field ranges with electromagnetic field-probe measurements. Recall that the fundamental motion for utilizing the spherical near-field measurement technique is to permit antenna measurements to be made at short range lengths, relieved from the constraint of the far-field criterion. Just as the illumination function in the test zone of an ideal far-field range is a uniform planar wavefront, the ideal illumination function for a near-field range is a spherical wavefront from an elemental dipole. The field probe measurements provide a quantitative and qualitative assessment of the deviation of either a near-field or far-field range from ideal conditions.

In this presentation the results from a program of field probe measurements for an experimental spherical near-field range are reported. A comparison is made between stray signal effects assessed by field probing the near-field range and by repeating pattern measurements at different range lengths. The two methods show consistent conclusions on the extraneous signal level. Differences and similarities between a spherical near-field range and a compact range are illustrated with field probe measurement data that strikingly reveal the basic difference between the two techniques.