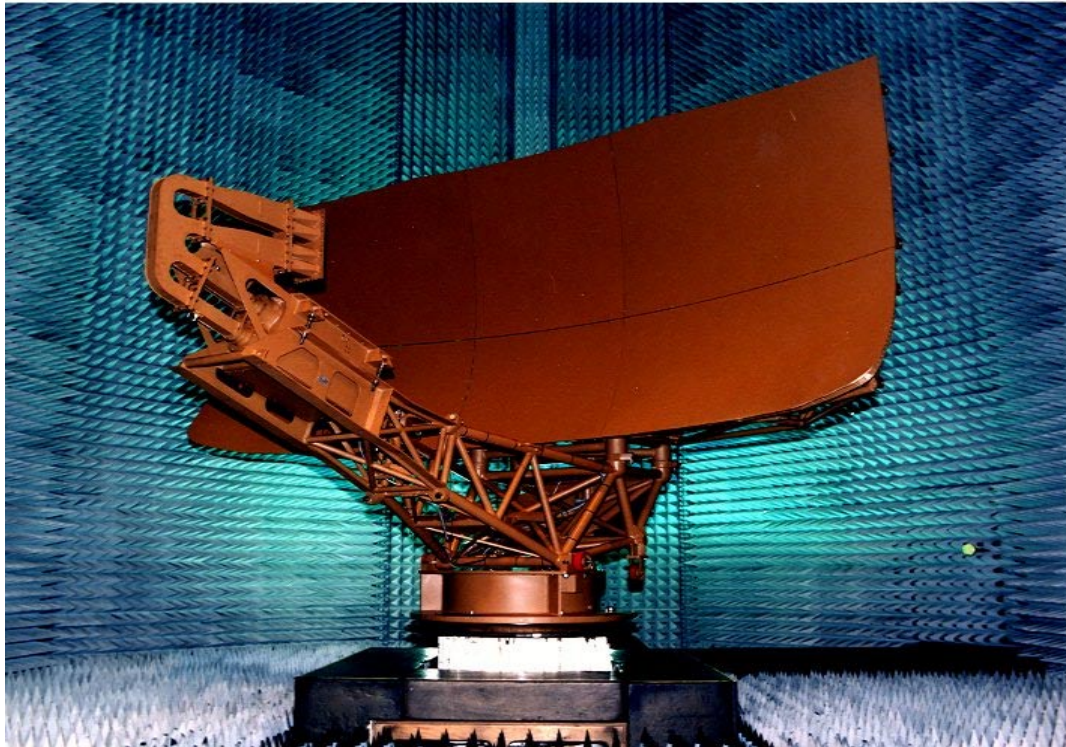


## NEAR FIELD TESTING



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## **NEAR-FIELD TESTING**

The radiation pattern of an antenna is usually measured on a far-field range. For anything more than a principal plane cuts this can be time consuming. It is also extremely difficult to measure very large antennas in this way. An alternative is to measure in the near-field region of the antenna and transform the results to the far-field. However, it requires that the electromagnetic field be accurately measured as a function of position. This can be achieved by measuring the phase and amplitude on the surface of an imaginary surface formed by the rotation of the antenna and the movement of a probe. These results are then numerically processed to produce the required radiation patterns. To undertake the processing accurately requires precise knowledge of the probe antenna characteristics and measurement in calibrated controlled environment. Near field testing has the following advantages:

- More accurate than a far-field range;
- Antenna pattern obtained in full three dimensions;
- Reduced measurement time for three dimensional patterns;
- Ability to measure large antennas;
- Gravity loading on the antenna is constant;
- Numerical model available for further pattern analysis;

### **Antenna Diagnostics**

- Uses near-field measured data;
- Rapidly identifies defective components;
- Proper implementation requires a thorough understanding of antennas.

### **Basic Method**

- Collect near-field data on a known (e.g., cylinder, plane or sphere) surface;
- Transform to far-field-sphere of infinite radius;
- Transform to the aperture plane if diagnostic information required (Fast Fourier Transform – FFT);
- Correlate the aperture field distribution with the antenna physical structure as appropriate.

## References

A good selection of technical papers on near-field antenna testing can be found on [www.nearfield.com/amta](http://www.nearfield.com/amta).

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## Disclaimer

*This is a general document giving an overview of antenna microwave testing capabilities. For details of the antenna testing program for a particular application, please, contact **Easat**.*