# RCS Measurement

Radar Cross Section (RCS) measurements have become increasingly important to military customers worldwide. RCS, measured in dBsm, represents the projected area of a sphere that has the same radar return as the target. The power received by a radar for a target indicates how well the radar can detect or track that target. For this reason, there is an ongoing effort to reduce the RCS of such objects as missiles, ships, tanks and aircraft.

MI Technologies has designed, constructed and fielded RCS systems for its U.S. and International military customers for many years. The MI's measurement systems, together with the MI-3000 data acquisition and analysis software, can be configured to take RCS measurements using the optional MI-3048 RCS Analysis Software. MI's RCS products and engineered solutions may be subject to US export restrictions.

RCS measurements fall into two categories, evaluation and diagnosis. Evaluation consists of measuring the "whole body" RCS of a target at a particular frequency from various angles to determine how well a particular radar will see the target. This measurement normally is used to transmit a single frequency toward the target in order to sample the return. The target is rotated by one or more axes to determine which observation angle presents the highest return.

The goal of diagnosis is to obtain the returns caused by the targets' components (wings, fuselage, engines etc). With this information, an object's design can be changed to reduce its RCS signature. High-resolution images of the down range and cross range response of an object are required in order to perform diagnostic measurements. Here, the target is rotated as in evaluation measurement with the addition of being illuminated with a wideband signal at each aspect angle.
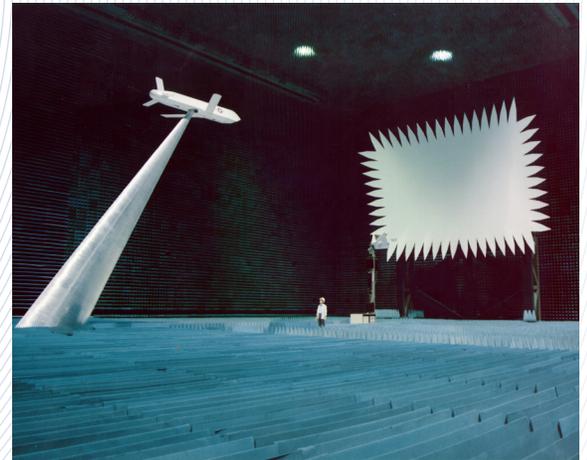
The MI-3048 RCS Analysis Software Option quickly processes data acquired in an RCS acquisition. Functions are provided to compensate for background subtraction and target calibration. The corrected data can be processed to generate various outputs such as:

- RCS versus frequency
- RCS versus aspect
- RCS versus down range
- Aspect
- Cross range
- Focused/unfocused ISAR imaging
- Range strobe

In addition, modules are provided to statistically analyze RCS versus aspect. Modules include:

- Sliding Window Geometric Mean
- Arithmetic Mean
- Media
- Minimum Value
- Percentiles and Probabilities

RCS measurements can be obtained in a variety of test configurations such as: very large outdoor far-field test ranges; dynamic ranges where the target 'flies by' the test radar, mobile radar systems placed in many environments, indoor anechoic chambers supplied with compact range equipment and aircraft hangers. While the type of facility used impacts the types of measurements that can be performed, MI Technologies has the experience and the technical know-how to design, install and operate the most efficient RCS facility to meet your needs.