

Range Probe Services



You rely heavily on your test range for accurate measurements on critical programs. When anything compromises the integrity of these measurements, it can jeopardize the quality of your products and services.

Accurate range evaluation solutions

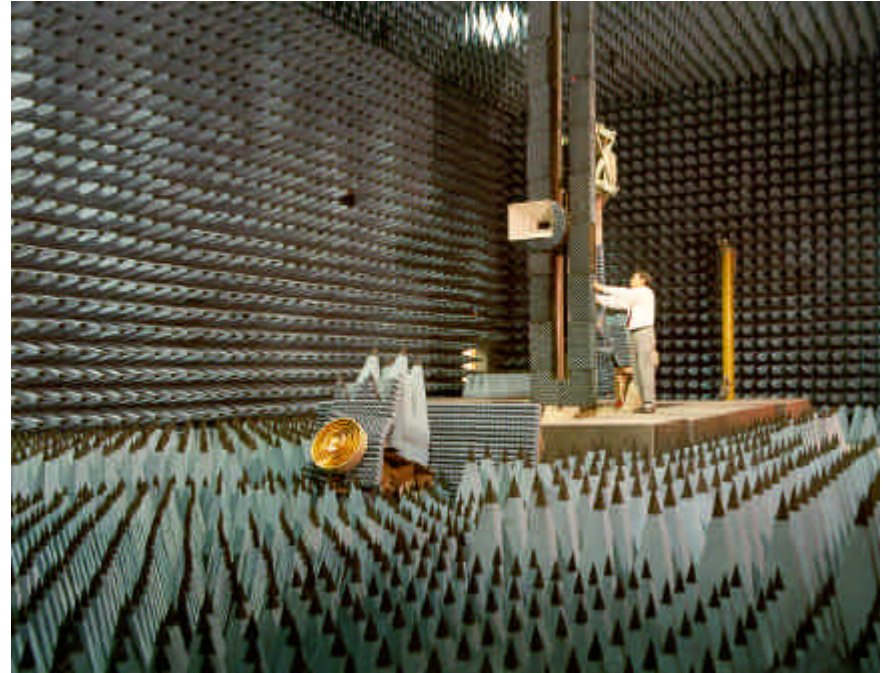
MI Technologies offers precision field probe measurements, probe data analysis and longitudinal pattern comparison testing designed for any type of range.

Our service uncovers and identifies the “unknowns” in the collimated electromagnetic field developed by a compact range reflector.

A range probe is also effective in the analysis of both indoor and outdoor free space ranges and outdoor ground reflection ranges. Our range probe analysis identifies anomalies that can cause asymmetry in measured patterns that can lead to loss of measurement accuracy or repeatability.

Range Anomalies

Extraneous electromagnetic signals are the most common cause of suboptimal range performance. These signals can result from reflection, diffraction or



signal leakage and can be generated from various sources within or around your facility. They can even be unwanted manifestations of your intended signal source that originate from reflector surface defects or that reflect or diffract from metallic, dielectric or absorber structures within or around your facility. Leaking cables or system interfaces of the device-under-test can also affect range performance, along with stray

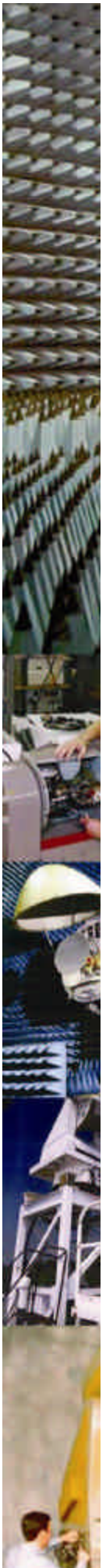
signals that may radiate into your range area from third party high-power sources such as broadcast stations, cellular towers or other radiating devices.

Your Professional Services Solution

Our Customer Support engineers and technicians will detect and help you correct these anomalies. We perform electromagnetic analysis using an MI Technologies' Phase and Amplitude probe apparatus, a complex system consisting of a versatile, precision single-axis linear positioner and a series of high quality probe antennas. The probe system includes a measurement and control workstation with an acquisition and analysis software package. Probe positioning requires a mast tower, polarization positioner, probe positioner, and floor slide positioner. MI Technologies can provide necessary instrumentation and cabling, or we can perform the probe with your equipment if you prefer.

Our Range Probe Service can help if you:

- Change your range configuration often
- Recently upgraded the range
- Added new test equipment to the range configuration
- Operate at a new frequency range
- Perform system level tests and suspect leakages
- Suspect outside interference near your unshielded facility
- Have not evaluated range performance in some time
- Plan to relocate your range test facility
- Must comply with government range performance specifications
- Are undergoing full commissioning of your new range installation
- Want to reestablish or confirm your range's performance specifications
- Detect anomalies in measured antenna, radome, or RCS patterns and suspect range performance has degraded



Typical Field Probe Test and Analysis Sequence

- Perform a detailed needs analysis, statement of work, and quotation at customer's request
- Under contract, our personnel arrive on schedule with all necessary probe system hardware and software
- Establish a range baseline by performing "golden-unit" antenna pattern measurements
- Set up and examine the probe equipment in the range
- Take a data set of amplitude and phase measurements of the electromagnetic field for all required polarizations, frequencies and each position within the quiet zone
- Collect the planar data set at a number of longitudinal positions throughout the quiet zone
- Perform the test for any number of a customer's alternate range configurations
- Tabulate, plot, and analyze the data for phase and amplitude ripple, identifying the magnitude and direction of an interference source
- Repeat the probe after making range configuration changes
- Ensure current performance meets or exceeds baseline performance by repeating golden-unit measurements



Optional Longitudinal Pattern Tests and Analysis

- Characterize stray anomalous range performance over a wider angle relative to a field probe
- Measure azimuth patterns at multiple longitudinal positions along the range source axis
- Use partial wavelength pattern test position to couple and decouple the extraneous signals
- Numerically tabulate and plot variation data to provide overall stray signal levels
- Identify and correct electromagnetic interference sources through data analysis



General Probe Specifications

Planar Positions: typically planar within +/- .005" to ensure accuracy; number based on test frequency wavelength

Longitudinal Positions: any requested number, with minimum based on test frequency wavelength

Polarizations: vertical, horizontal and any polarization between

Quiet Zone Size: standard probes available to 18 ft. diameter and larger with custom fixtures

Frequency Range: 1 to 140 GHz

Test Report: amplitude taper magnitude, amplitude and phase ripple and variation, phase variations, and cross polarization levels (some parameters are frequency-limited)

Our Expertise

Our Phase/Amplitude probe system provides a much higher level of accuracy than less sophisticated equipment. Our probing system correlates amplitude and phase variation with position in the quiet zone of your range and determines the nature of electromagnetic field error sources.

But our people are the biggest benefit of our range probe service. Our professionals are trained and experienced in performing probe measurements and in identifying and resolving your range problems. They are committed to helping you make the adjustments necessary to establish accurate, reliable performance from your range. Our professionals can help you schedule periodic range probes to verify the consistency of the electromagnetic quality of your range.

For more information, contact MI Technologies' Customer Support Service Center.