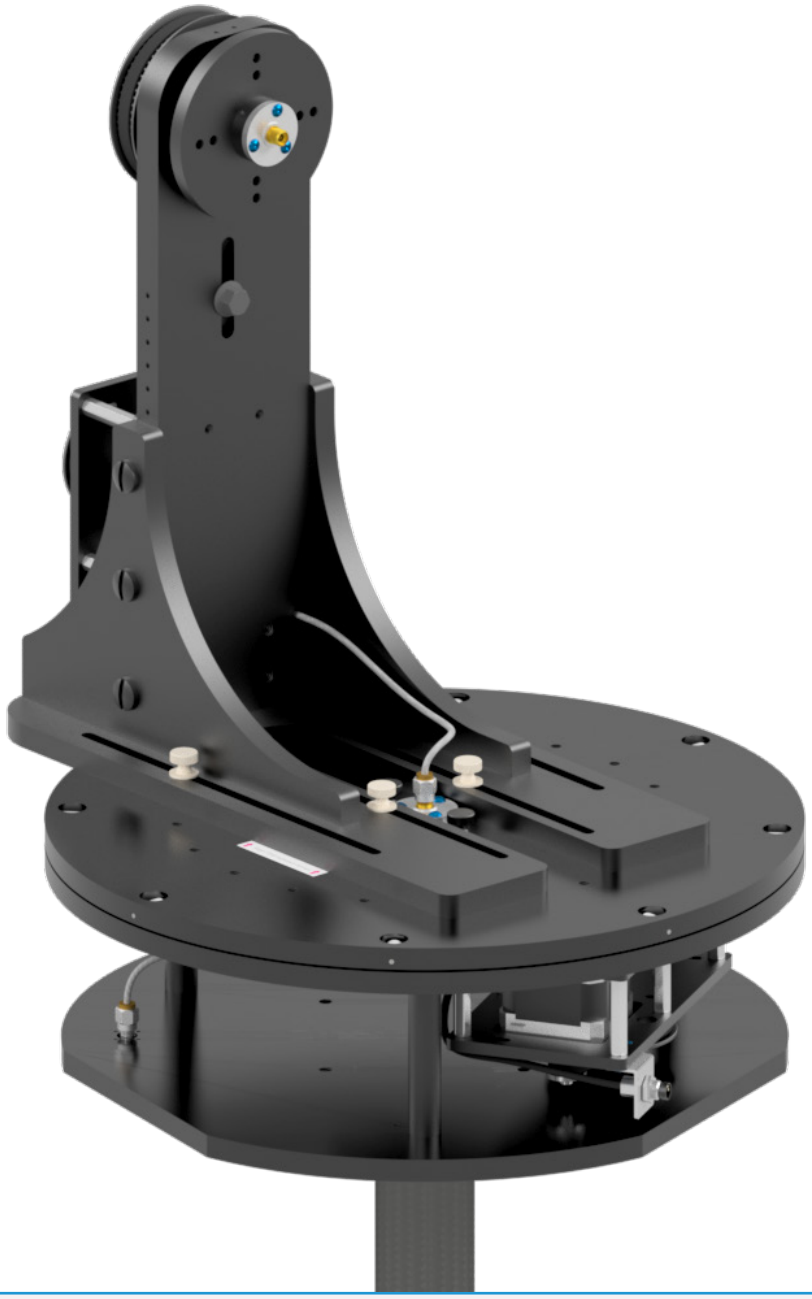
Diamond Engineering

Automated Measurement Systems

DAMS Economy Series (E-Series)



Features and Specifications

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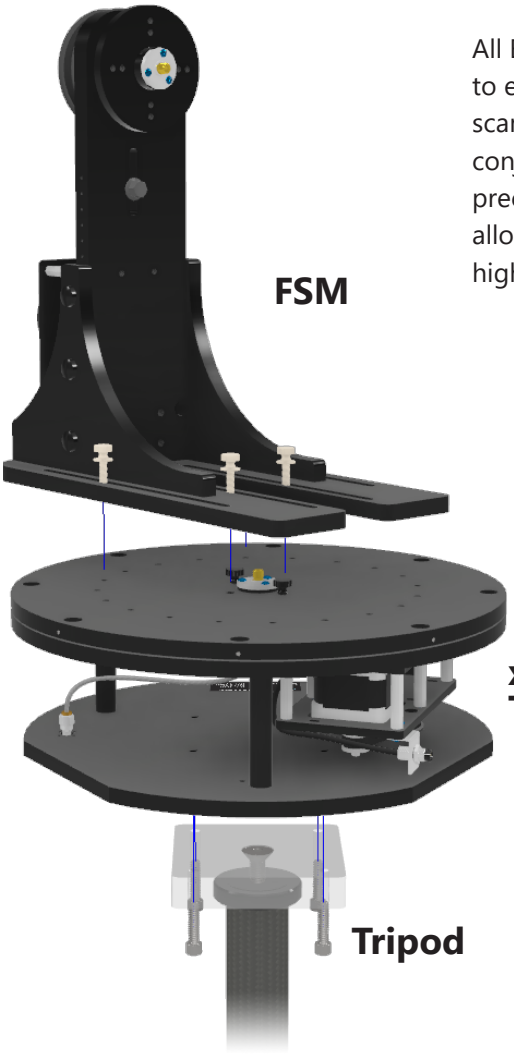
Introduction

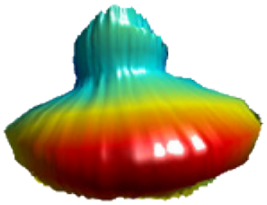
The Diamond Engineering DAMS Economy Series (E-Series) is our most economical full-spherical and fully automated antenna measurement system. It's designed for devices weighing up to 5- or 10-pounds (model dependent). This series unites the simplicity and ease of our x000 series systems with our FSM add-on in a single package.



All E-Series systems feature a non-metallic, belt-driven turntable to ensure a low-reflection environment, ideal for 360° azimuth scans of electrically small or omnidirectional antennas. In conjunction with the FSM attachment, the E-Series enables precise 360° elevation measurements. These combined motions allow for rapid, fully-automated spherical testing with extremely high precision and minimal effort.

Patch antenna measured *without* FSM

Freq = 5 GHz Az = -10 EL = 25



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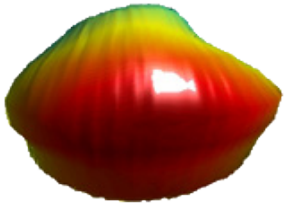
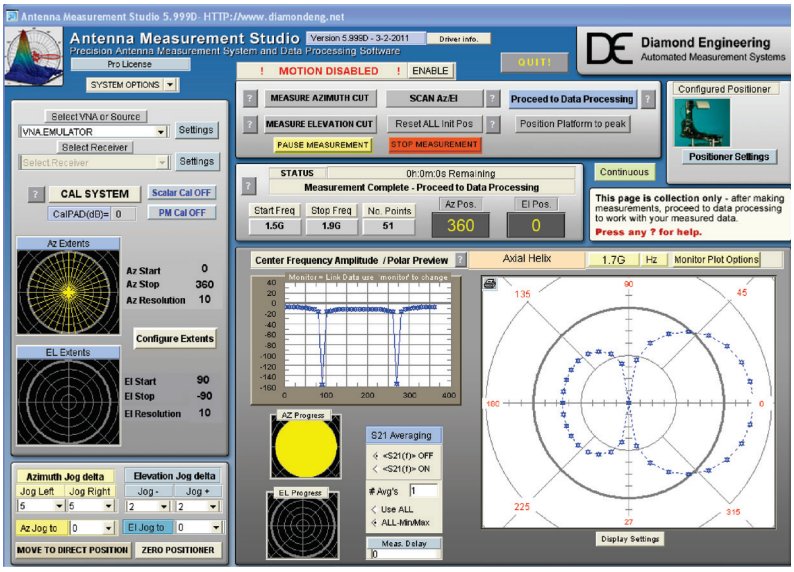


After all data has been collected, it is then processed through the included DAMS Antenna Measurement Studio, which provides comprehensive analysis tools and a variety of two and three dimensional visualization options.



System Features

Wide Frequency Ranges

Capable of measuring from DC to 6 GHz, DC to 18 GHz or DC to 40 GHz depending on your chosen model.

Dual-Axis Movement

All systems in the E-Series are capable of 360º continuous or sweeping azimuth and elevation.

High Resolution

Capable of as small as 0.0625º steps for azimuth and 0.10º steps for elevation.

Weight Capacity

Able to carry payloads of up to 10 lbs.

Precision Rotary Joints

We only install the finest quality precision rotary joints specified for extremely low insertion loss (<0.1 dB), premium phase and amplitude stability and more.

Deluxe Measurement Software

All systems come complete with DAMS Measurement Studio which features a vast array of plots and functions.

Spherical Plot Module

Map measured antenna data over a sphere or an ideal isotropic sphere.

Complete Warranty

Our 1-year warranty covers all parts, labor and technical support for the 6 GHz models while our 3-year warranty covers the same on 18 GHz and 40 GHz models.

Included RF Cables

All standard systems include two 10-foot calibrated measurement cables. Precision low-loss SMA cables *(6 GHz models)*, precision ultra-low-loss SMA cables certified to 18 GHz or precision low-loss cables with 2.92mm "K" connectors certified to 40 GHz.

Includes All Accessories

This is the complete measurement solution and includes everything besides the VNA, GPIB card and/or a computer *(for 18 GHz or 40 GHz models)*. Note: Turnkey options exist to include everything you'd need.

Precision Drive Train

Equipped with a precision stepper motor, and Kevlar® belt transmission.

Advanced Measurement Calculator

This module within DAMS Antenna Measurement Studio can perform detailed and complex computations, enable the user to create theoretical scenarios and more.

Positioner Specifications

Platform Operating Specifications

Frequency Ranges:
DC to 6 GHz *(ES5-6, ES10-6, ET-6)*
DC to 18 GHz *(ES5-18, ES10-18, ET-18)*
DC to 40 GHz *(ES5-40, ES10-40, ET-40)*

Platform Movement:
Azimuth 1.8 degree precision stepper motor with low-noise belts
Azimuth: Up to 0.0625º step resolution
Elevation: Up to 0.10º step resolution
360º continuous azimuth and elevation range

Platform Max Speed:
30 R.P.M. azimuth
120º per minute elevation

Platform Mounting:
Velbon tripod with fluid pan head
Standard 1/4-20 tripod threads (horizontal or vertical)

Weight Capacity:
5, 10 or 20 lbs. maximum *(model dependent)*

Drivetrain:
Azimuth: stepper motor with belt transmission
Elevation: stepper hybrid non-captive lead screw

Cable Interface:
Ultra-high quality cable with SMA connectors (all "K" connectors on model 7000)
Ultra-precision, ultra-low noise rotary joint with SMA (female)

Included Accessories:
Acrylic thrust plate *(aluminum available for additional cost)*
Digital level for precise setup*
Ultra-high resolution option*
Positioning laser for long range alignment*
Vertical alignment tool*
DAMS Software Studio Pro
Advanced processing module
Technical support

Warranty:
1-year on parts and labor *(6 GHz models)*
3-year on parts and labor *(18 or 40 GHz models)*

** Not included with standard 6 GHz models*

Controller Operating Specifications

Control Methods:	DAMS Antenna Measurement Software Customer written software with serial communication (requires Platform Development Kit)
Interface:	Hybrid USB/serial
Input Power:	24V 1.6A switched power supply
Analyzer Interface:	GPIB controller card ***(not included)***

Physical Properties

Width:	12″ (30.5 cm) without tripod
Height:	17″ (12.5 cm) without tripod Min: 47″ (88.9 cm) with tripod Max: 84″ (182.88 cm) with tripod
Weight:	5 lbs. (2.2 kg) without tripod 9 lbs. (4.1 kg) with tripod
Turntable Composition:	Acrylic 87% Stainless steel 5% Aluminum 5% Misc. plastics/metals 3%
FSM Composition:	Delrin 90% Plastics 8% Stainless steel 2%
Tripod Composition:	Aluminum and plastic

Environmental Specifications

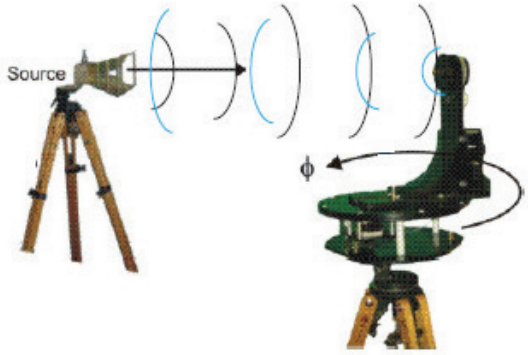
Operating Temp:	0º C to 45º C (32º F to 104º F) (with no condensation)
Transport Temp:	-40º C to 60º C (-40º F to 140º F) (no condensation within 72 hours)

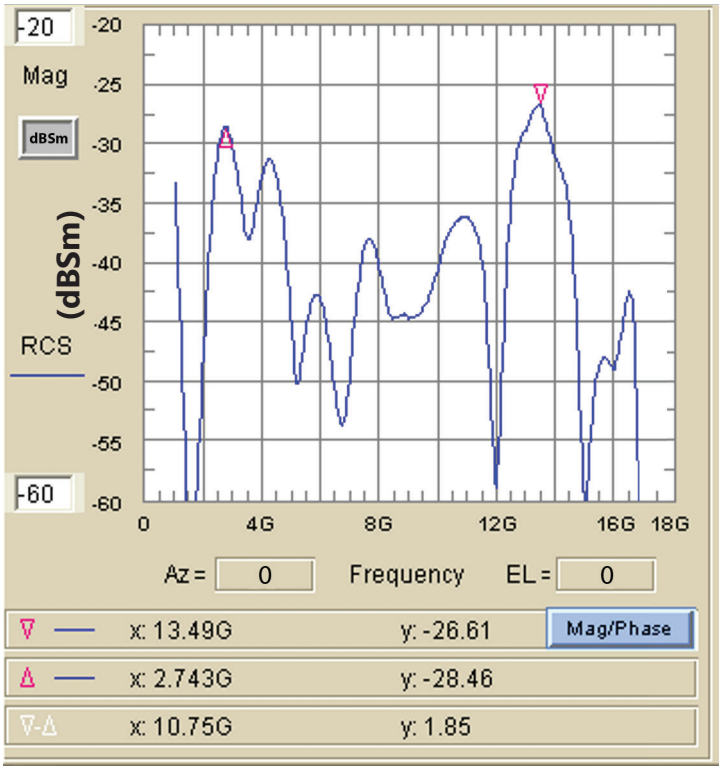
Low Radar Cross Section Profile

Overview

An object's RCS profile is a principal concern when designing for low-reflection and/or stealth applications. Naturally, you'll want an accurate way to measure this without concerns of the measurement device itself adding artifacts or noise. The Full Spherical Mount option enables quick and efficient Radar Cross Section (RCS) profile measurements of your AUT/DUT with minimal positioner reflectivity. The extremely low-reflection design - combined with wide frequency range capabilities of DC to 40 GHZ - makes the FSM ideal for obtaining accurate RCS measurements.

Typical Radar Cross Section Data at 1-Meter



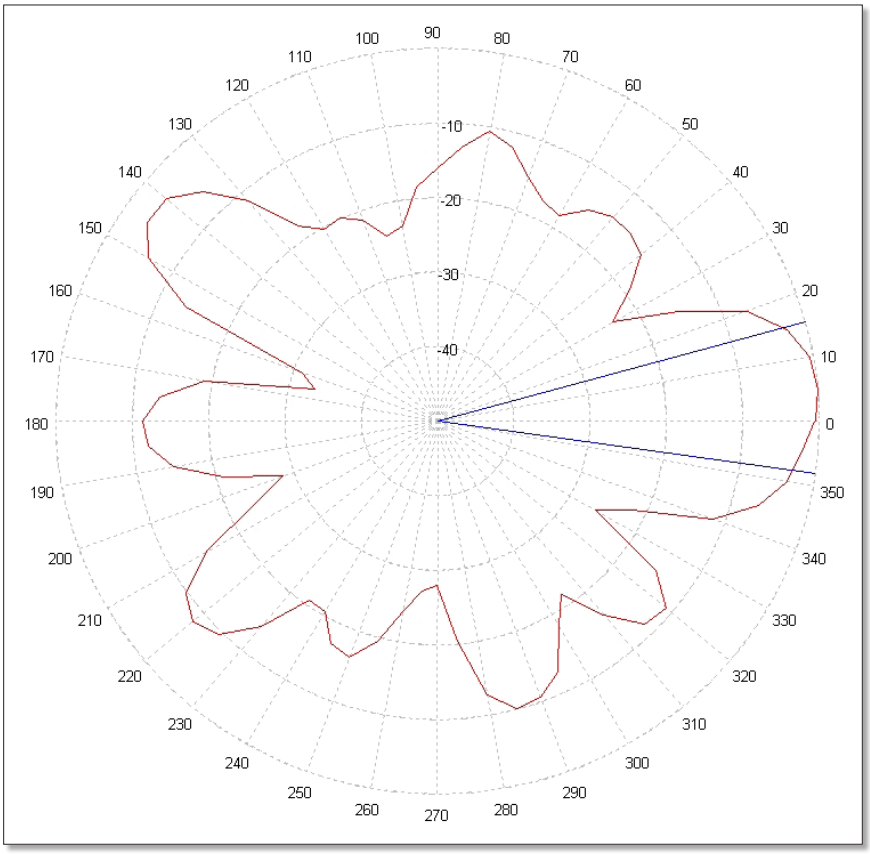


Our amplitude frequency feature illustrates which frequencies the amplitude of your RCS profile are highest and lowest at as gathered from the measurement data.

Plot Examples

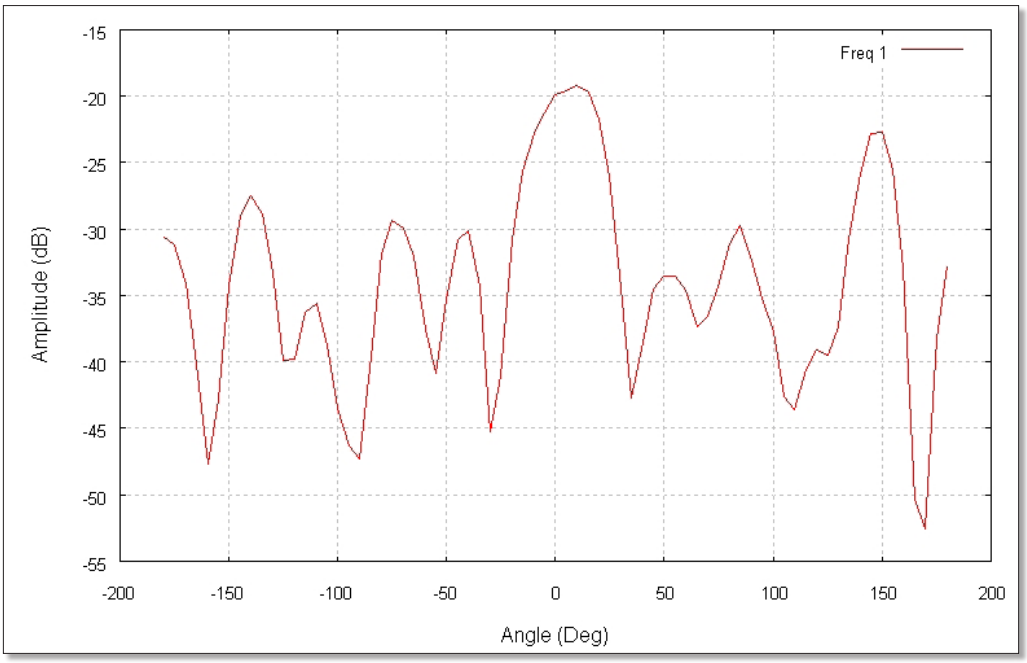
Polar Plot Example

DAMS FSM typical RCS profile measured



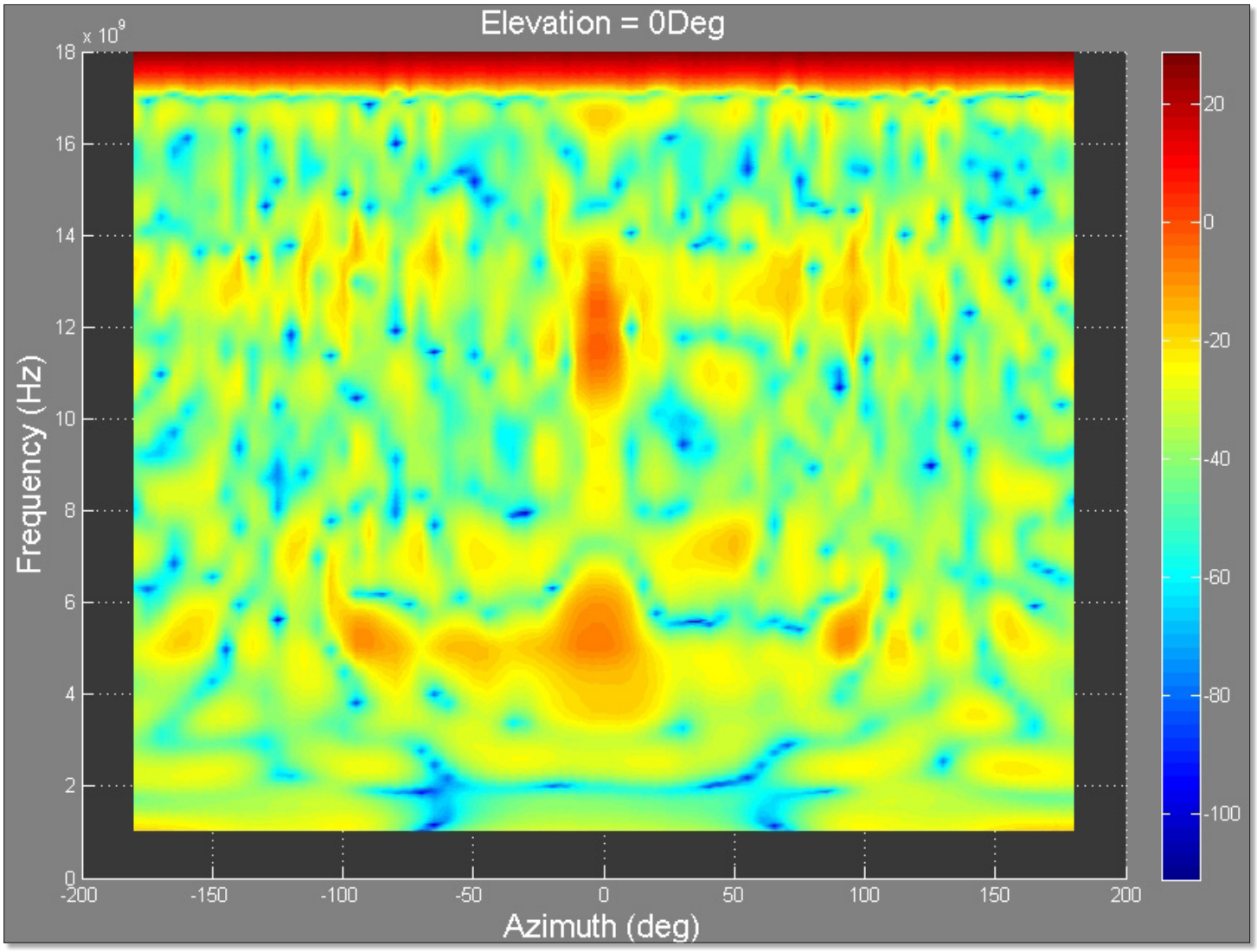
Amplitude vs. Angle

DAMS FSM typical RCS profile measured

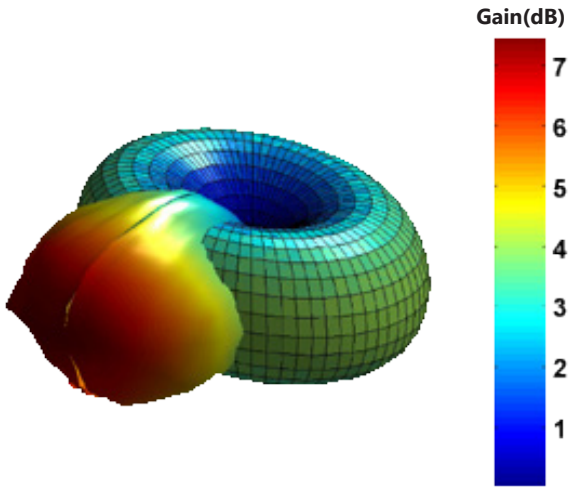


Color Chart

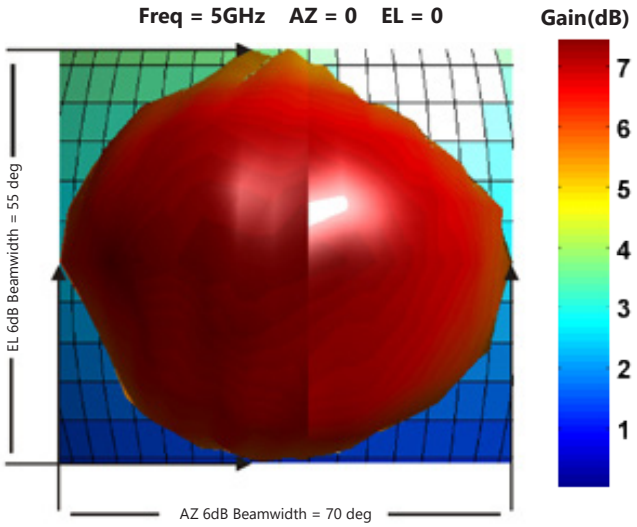
Measured DAMS RCS profile processed with simulator and advance plotting



Spherical plot of AUT (Patch) gain with ideal 3dBd dipole

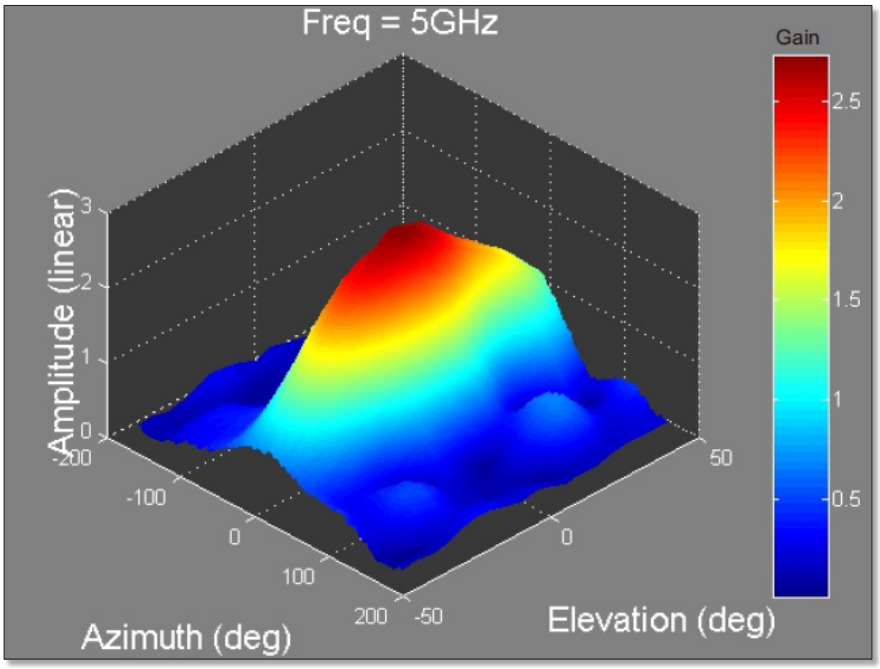


Spherical plot of AUT (Patch)
6dB beamwidth using 6dB gain Iso-sphere



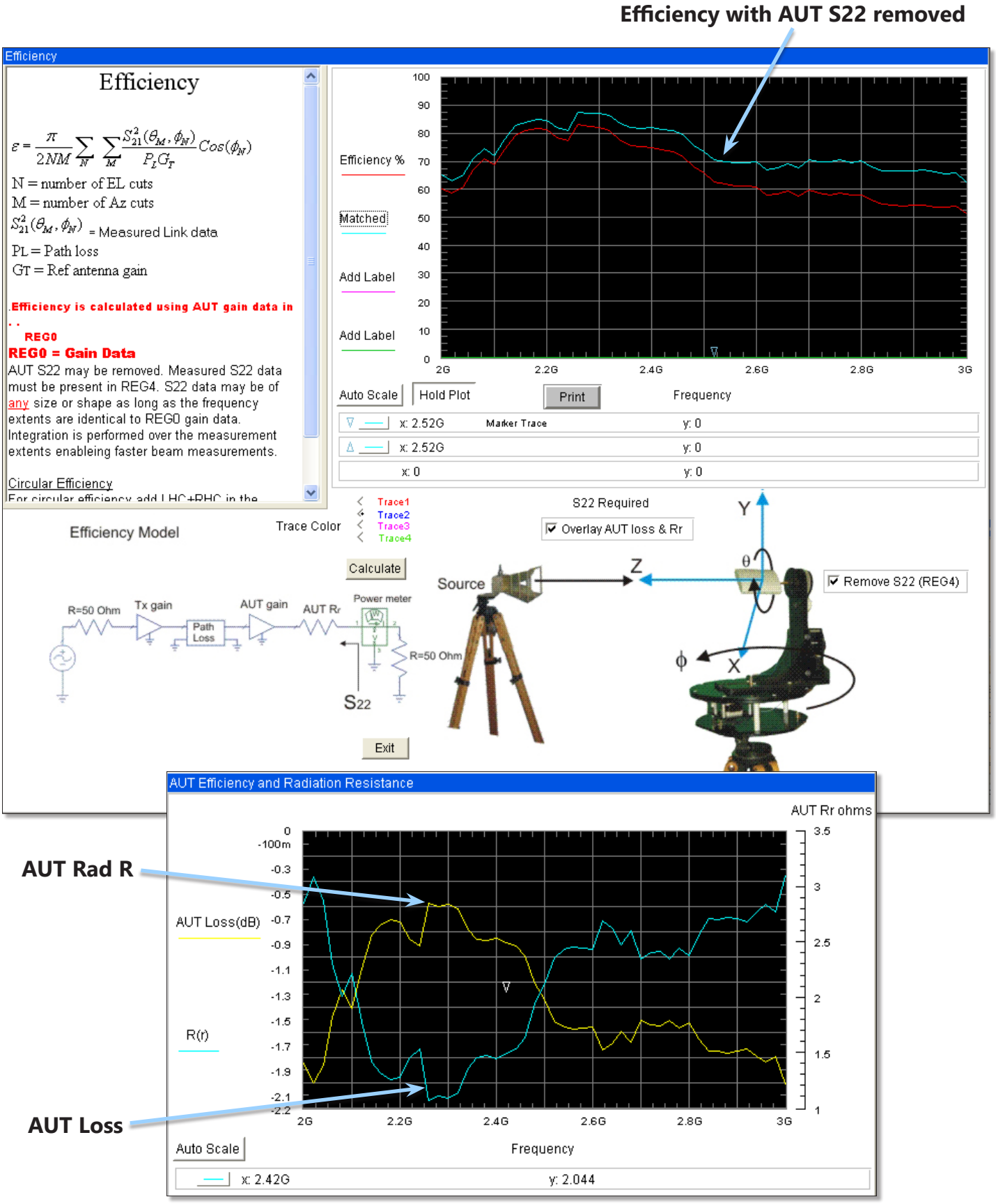
Iso-Sphere grid set to 5 deg/div AZ and EL

Linear AZ-EL Plot of AUT



Polar Plot of Patch AUT showing all AZ EL contours relative to Max Gain

Efficiency Measurement Functions



More Information

Standard Economy Series Models

Model	Frequency Range	Max Payload
ES5-6	DC to 6 GHz	5 pounds
ES5-18	DC to 18 GHz	5 pounds
ES5-40	DC to 40 GHz	5 pounds
ES10-6	DC to 6 GHz	10 pounds
ES10-18	DC to 18 GHz	10 pounds
ES10-40	DC to 40 GHz	10 pounds

DAMS Antenna Measurement Studio

For more information about our software, including screen shots, full specifications of capabilities and the ability to download a demo version, please visit:

http://www.DiamondEng.net/PDF/software_specs.pdf

DE Broadband Reference Horns

For more information about our broadband reference horns, please visit:

http://www.DiamondEng.net/PDF/de0726_datasheet.pdf

DE Power Amplifiers

For more information about our broadband power amplifiers, please visit:

http://www.DiamondEng.net/power-amplifiers

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