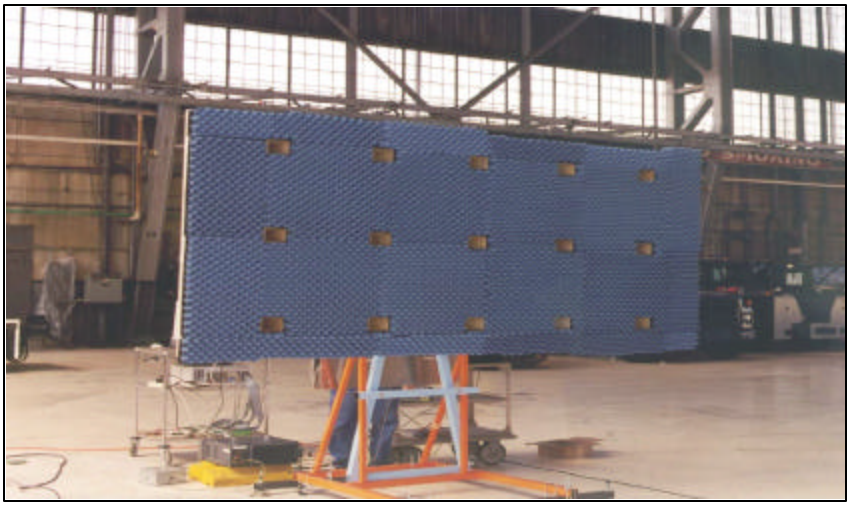
Radiated Direction of Arrival Simulator (RDAS)



Maintenance of US superiority requires that current and future combat resources be equipped to counter an increasing diversity of aircraft and missiles. One cost-effective response to this requirement is the use of both computer and hardware simulations to dynamically test US electronic warfare (EW) systems against different threats under various engagement scenarios. Historically, most laboratory tests of EW systems have used direct insertion of the simulated threat signals into the receivers of the system under test (SUT). Advanced radars currently under development use electronically steered arrays to passively locate and track targets by their electromagnetic emissions. The need exists for a dynamic target simulator that accurately simulates the signals/emissions from distant moving targets within the constraints of an RF anechoic chamber. Other applications such as maintenance and flight line check-out have similar requirements.

S*R has developed a Radiated Direction of Arrival Simulator (RDAS) utilizing an array of 15 antennas to simulate one or more moving emitters within the field of view of passive radars. RDAS also measures the pointing direction of arrival of the radar beam.

RDAS FEATURES

- X-Band Operation
- Horizontal or Vertical Polarization
- Computer Control
- Mobile Test Panel
- Adjustable Antennas
- Adaptable to Various Radar Bands

MODES OF OPERATION

• RDA Mode

Detects the center of impinging X-Band radiated transmissions to within ±0.2º and it transmits a simulated target return signal from the detected location to within ±0.2º.

• Target Simulation Mode

Simulates smooth target movement in steps of 0.1º.

RDAS SIMULATOR DESCRIPTION

• Antenna Panel

The Antenna Panel is a mobile, absorber lined, 5 foot x 10 foot honeycomb structure with fifteen horn antennas mounted at 2.38 ft spacing (1º at 105 ft.) in a 3 Vertical x 5 Horizontal array. In the Target Simulation mode, the panel serves as the RF return source for precise target movement simulation as seen by passive tracking radar. In the RDA mode, the panel antennas route the received signals to the Processor which samples beam pulses, computes the beam centroid location on the panel, and transmits a simulated target return from the computed location on the panel.

WARNING: *Export Control Act (Title 22, USC Sec 2751 et seq) or Export Administration Act of 1979, as amended, Title 50, USC App 2401, et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate IAW the provisions of DoD Directive 5230.25.*

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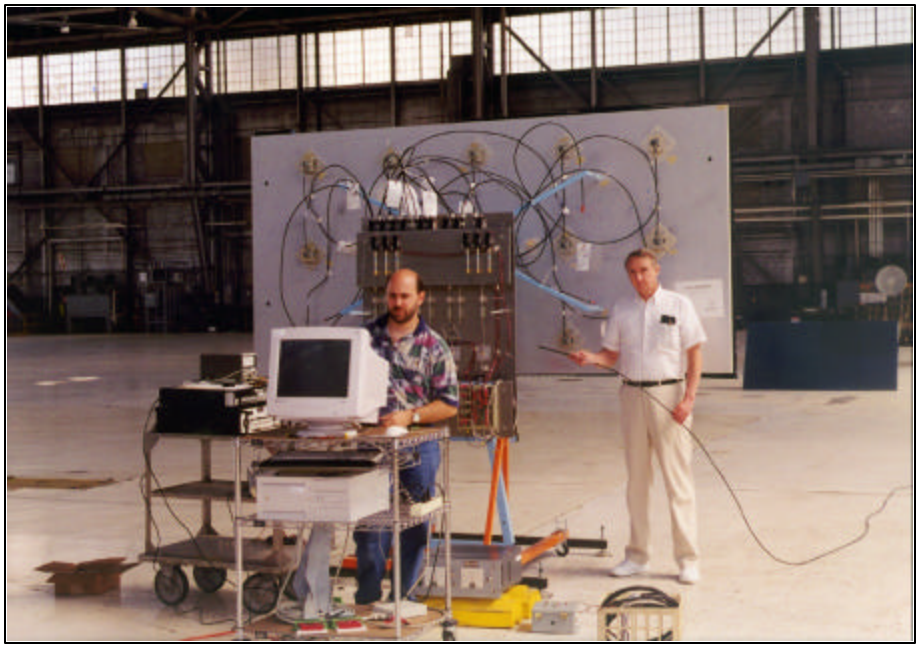
• RF Distribution Network

A Quad RF Distribution Network (discrete amplifiers, isolators, diode switches, and vector modulators) controls RF amplitude and phase to antenna quads to generate smooth target movement.



• Beam Centroid Processor

This electronic assembly samples incoming radiated pulses and computes the location of the beam centroid and passes this information to the PC. The processor is located on the back of the test panel.

• Software/Computer Control

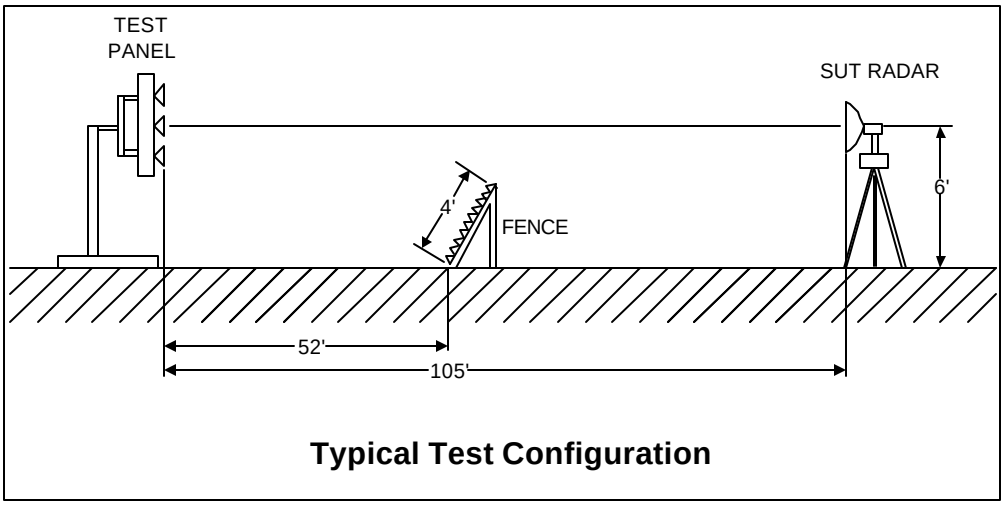
Software is hosted on a Pentium Pro PC Utilizing the Windows NT 4.0 operating system. RFDN control and system calibration programs are written in LabView™.

• Power Requirements

24 VDC @ 2A (panel hardware)
115 VAC for peripherals

• Applications

- Threat Simulation
- Antenna Calibration
- Radar Maintenance
- EW Testing
- Flight Line Check



Typical Test Configuration

RDAS PERFORMANCE

Operating Frequency: X-Band
Maximum radiated power(transmit mode): 8 dBm

Max moving target step (transmit mode): 0.1º
Control of target location: ± 0.2º

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