DATASHEET

Radar Environment Simulator (RES)

Generic Design Supports Multiple Radar Applications

- **Cost-effective, flexible solution**
- **Up to 500 targets per scenario**
- **Up to 16 simultaneous channels**
- **Each channel can be a target, ECM, clutter or chaff simulation**
- **Wide variety of ECM techniques and target modulation**

Mercury Systems is the world's largest supplier of DRFM-based and DSP/Synthesizer-based RES systems. These RF Direct Inject simulators have been developed to be generic to support multiple types of radar systems. The Radar Environment Simulator (RES) systems are used for applications ranging from anechoic chamber and open air range (OAR) to laboratory-based radar production testing and comprehensive radar performance evaluation.

To date, Mercury Systems has produced RES systems to test over 40 different radars and seekers. The RES designs utilize advanced ASIC, FPGA, DSP and DDS technologies for high fidelity signal capture, modulation and regeneration. Coupled with PowerPC® processors on an open VMEbus standard architecture, the RES systems are very cost-effective and flexible solutions for most radar testing applications.

Mercury Systems manufacturers many varieties of RES products based on several different signal processing technologies. This allows Mercury Systems to tailor the best available technology to each customer's requirement.

Applications

Radar performance evaluation

ECM vulnerability assessment

Radar production testing

ECCM training/tactics development

Advanced missile seeker/fuse testing

Air defense personnel training

Receiver/processor development

Features

Up to 500 targets per scenario

Up to 16 simultaneous channels

Each channel can be a target, ECM, clutter or chaff simulation

Wide variety of ECM techniques and target modulation

Wide instantaneous dynamic range

Outputs: Digital, IF and RF – baseband to 100GHz

Closed loop operations with radar

Real-time external or local host control

Modular/configurable design

Standard VMEbus architecture

Windows-based graphical user interface (GUI)

Features *(Continued)*

Real-time, runtime displays of SUT, targets, ECM, etc.

Plan, range/bearing and HUD displays available

High-speed scenario update rate

High reliability

Comprehensive BIT and calibration software

Optional free space interfaces for range and anechoic chamber support

Optional data link, IFF and video support

Supports monopulse, multi-channel, multi-beam radars

Supports mechanical and electronically steered antennas

Data logging for post-test correlation

Specifications

Scenario

Targets in scenario	Up to 500
Targets in beam	Up to 16
Jammers in scenario	Up to 12
Jammers in beam	Up to 4
Chaff in scenario	Up to 12
Chaff in beam	Up to 4
Weather in scenario	Up to 4 cells
Weather in beam	Up to 2
Ground/ship clutter	Downloadable 360° clutter definition
Airborne clutter	Dynamic MLC, SLC and ALR

Signal Fidelity

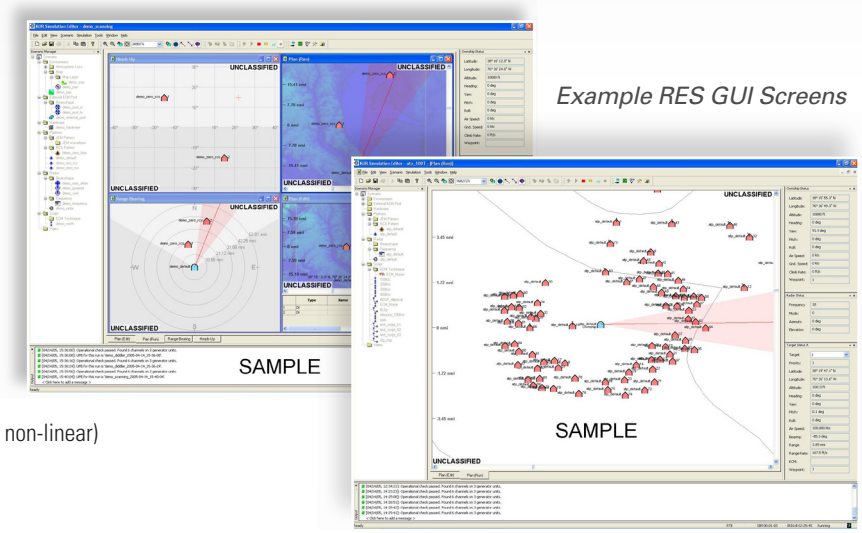
Frequency range	SUT dependent-VHF to W-Band
Antenna types	Mechanical, electronic, combination
Waveform types	OW, pulse, phase-coded, FM (linear and non-linear)
Pulse width	50 ns to CW
PRI	<10 Hz to > 5 MHz
Spurious	<65 dBc typical
	Up to <-60 dBc worst case
Dynamic range	>120 db
Amplitude resolution	0.25 dB
RF ON/OFF isolation	100 dB
Doppler range	>+5 MHz
Doppler resolution	<0.1 Hz
Range	50 m to 1500 km
Range resolution	<0.3 m

Target Fidelity

Mean RCS value	0.001 to 1,000 0o0 m2
3-D RCS patterns	±180° EL, ±90° AZ
	±30 dB at 0.25 dB resolution
Scintillation	Swerling cases 0-4 + user-defined
Geometry modeling	6 (DOF)
Jamming assets	Combination coherent and non-coherent and chaff
Target modulations	User-definable modulations for JEM, Blade, etc.; Aspect Angle Dependent

Interface Options

External computer control
Interfaces to additional radars
Jammer in the loop interfaces
IFF simulation (Mark XII, all modes)
IRIG A/B/G for synchronization
Free space transmission
Man/pilot in the loop
Video PPI and data link support
Data logging of SUT/target data



Example RES GUI Screens

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