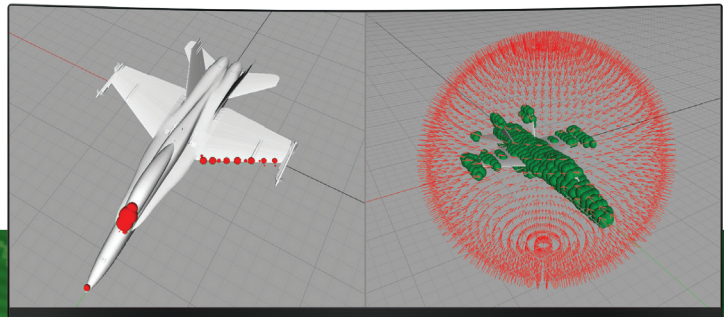


RSGS

RADAR SIGNAL GENERATOR SIMULATOR



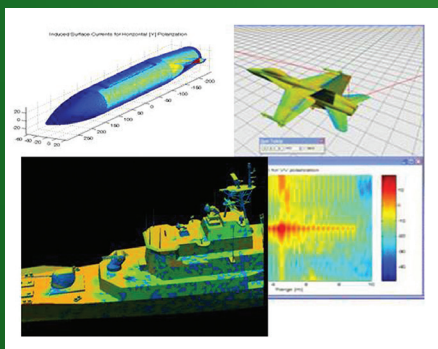
OVERVIEW

The test and verification cycle of radar systems is a real cumbersome. In many cases test scenarios for load and performance tests having complicated features and components is not doable. Normally, that is tackled by simulation scenarios run on the vendor-specific simulation model. In spite of the fact, vendor-specific simulation model is not truly acceptable and reliable model as its complications are not open and changeable by the customer.

Radar customers want to measure the radar performance accurately for different scenarios. When performing characterization of a radar receiver design, a variety of signals are required to recreate the operational environment.

To provide a test tool which is not vendor-specific and is open to customer for many different scenario and parameter combinations, CTEch developed a Radar Signal Generator Simulator system to measure and analyze the radar performance. For generation of synthetic radar data for testing purposes, generic and realistic I/Q signal injector was developed from simulated environment.

RSGS is a realistic radar data generator tool capable of simulating returns from targets, and environmental effects like surface and volume clutters from synthetic scenarios. The data output is time series signal at baseband IQ level. The data generated by RSGS provides test vectors of real radar receiver data to test signal processor design and implementation easily. This real signal can then be transmitted or applied to the system hardware under test.

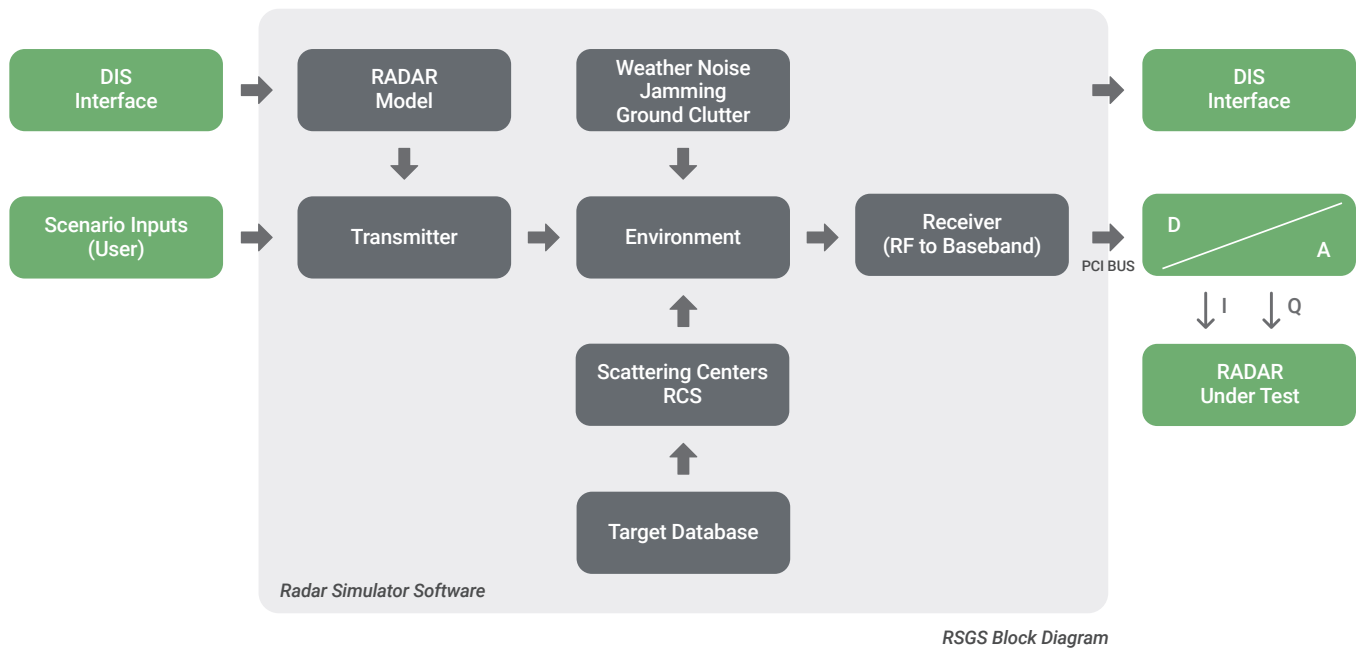


RSGS does not use a single Radar Cross Section (RCS) value for a target; it uses Scattering Centers of Targets to generate more precise radar echo signals. Scattering Centers extracted from the target related to its orientation towards to radar using 3D CAD models of targets. A general block schema of the radar simulator is shown in the following.

SCENARIO DEFINITION

The system has the capability of defining scenarios with different weather as well as operational conditions and generates the realistic I-Q signals coming out of that scenario. The user will be able to fine tune any of virtual radar parameters and will see the signals out of those new conditions. By feeding and comparing the virtual radar I-Q signals into the radar to be tested, a customer is able to see and compare the actual radar systems performance especially under harsh and demanding test scenarios.

Test scenarios are defined by the user using scenario definition interface. The Radar Simulator can take the scenario information from DIS interface as well as user inputs. A digital terrain is loaded (DTED or any type of digital map) and target platforms, natural conditions are defined in this module. RSGS generates the I-Q signal in digital domain and transfers the data to a D/A Converter via PCI Bus to generate analog I-Q signals. Real time process employs the algorithms to construct I-O signals and range-profile for each line of direction.



SYSTEM FEATURES

- Scenarios definition
- Producing I and Q signals from simulated environment
- Range profile extraction
- Doppler processing
- Weather effect producing land and sea clutters
- Producing Scattering Centers and Radar Cross Section
- Fast Sensor Coverage analysis
- Using a type of digital map
- Using a 3D CAD model of target platforms
- 100 targets injections simultaneously
- TCP/IP interface

DEVELOPMENT ENVIRONMENT

- 3U cPCI chassis with 6 PCI slots
- Intel based Single Board Computer
- cPCI Virtex-6

