# RT Logic Achieves Hardware-In-the-loop Generation of Precision RF/IF Signals Using STK Engine from AGI

Component Supplier Advances Testing, Lowers Costs

THE SCENARIO: RT Logic provides ground system components and test instruments for satellite and range operations. Testing for UAV, missile, and target applications can be dangerous and expensive. If the system experiences telemetry loss, the mission may fail due to indecipherable data. Worse, the platform may need to be destroyed to ensure safety. Additional challenges include testing systems or assets not yet deployed. These require in-depth understanding of algorithms, modeling trajectories, propagation effects, and astrodynamics. The need to validate a system with simulated equipment can further complicate testing.

THE APPLICATION: Through their experience with RF/IF testing and measurements, RT Logic identified a need for low-cost, stationary evaluations. They selected AGI'S STK Engine to complement their Telemetrix product. Incorporating accurate 3D visualization within a customizable GUI, the software leverages a high-fidelity geometry engine for modeling platforms to let RT Logic conduct flight testing without leaving the ground.

The combination of RT Logic's true channel simulator with AGI software has resulted in a product that creates a true-to-life test environment. Operating these products in tandem allows users to conduct significantly more extensive tests and experience dramatic decreases in the cost of both testing and total system design.
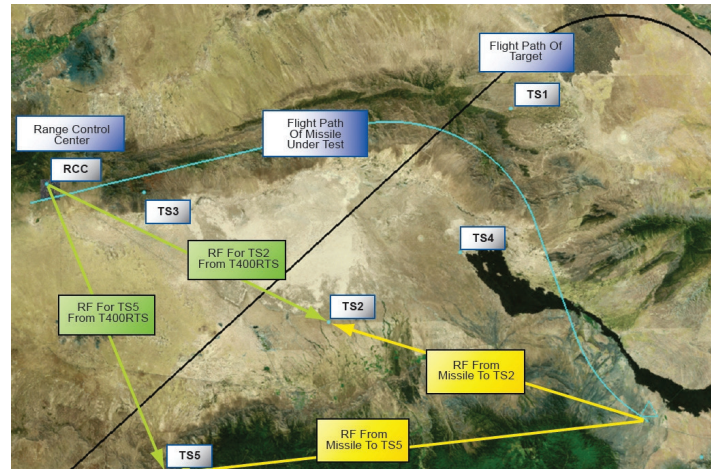
High-fidelity communications testing can be expensive, with scenarios that may involve hypothetical conditions not easily replicated. At the same time, users may not possess the knowledge to model these tests. RT Logic used the STK Engine to reduce time-to-market—eliminating required expertise in channel models, propagation effects, or astrodynamics. As a result, they deployed a communications system verification product generating RF/IF signals indistinguishable from actual missions.

THE RESULTS: AGI software allowed RT Logic to reduce time-to-market with a precision channel simulator that generates RF/IF signals indistinguishable from an actual mission. The resulting tests incorporate Doppler shift, range attenuation, interference, obscura, and range delay. Controlling the Telemetrix channel simulator through AGI's time-dynamic geometry engine, RT Logic eliminated the need for user expertise in channel models, propagation effects, or astrodynamics. This has ultimately reduced development time, cost, and risk—providing RT Logic the flexibility required to further enhance their product line in the future.

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