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## Why it pays to test before you fly

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### An exclusive interview with a technical leader.

By Larry Maloney, Contributing Editor -- Test & Measurement World, April 1, 2011

#### Q: What do you see as key requirements for test equipment in demanding aerospace applications?

A: Performance is essential. You must be able to absolutely trust that a piece of test equipment will give you accurate stimulus and measurement for the unit under test. Flexibility is also a key attribute. Test equipment can be expensive, and engineers want to use it from project to project, which is why RT Logic creates modular instruments that engineers can reconfigure easily. Modularity allows you to reduce costs at the outset and add to the system over time.

Our instruments also are software-defined, which is another asset in expanding test systems. Finally, test equipment must be easy to use, with a good graphical interface and clear documentation. You shouldn't need a PhD to operate it.

#### Q: How do these qualities come into play in rigorous applications?

A: When I was working with the intelligence community, we had very complex signal-intelligence ground-processing systems that had to quickly and accurately detect, identify, and geolocate signals. That environment was constantly changing, so you had to constantly tune your signal-processing system. Reliable test equipment was essential. If it failed you, lives could be lost. Another example is a test bed, featuring an RT Logic channel simulator and signal generator, which we developed for a government customer. It had to have near perfect representation of the signal environment, as well as geolocation capability to identify interference sources. The test bed also had to train new operators, verify software releases, validate procedures, and optimize tactics for detecting jammers.

#### Q: What is RT Logic's special niche in the test-and-measurement field?

A: Our niche is best defined by our flagship product, the Telemetrix 400 Channel Simulator. It generates precise signals for applications ranging from R&D to the testing of communications equipment on satellites, ground stations, UAVs (unmanned aerial vehicles), aircraft, missiles, and more. We put either an RF or IF signal into the instrument, and after sophisticated digital signal processing, the real-time output is indiscernible from real-world signals. The simulator creates test signals and waveforms with absolute attention to the physics of Doppler shift, delay, attenuation, noise, interference, and other perturbations.

#### Q: What are some growing applications for the channel simulator?

A: R&D and test for satellites and UAVs continue to be important, but we also see growth in operations. At many ground stations, before an actual pass with a satellite, the simulator exercises the ground station receiver to verify its operation. Or before a live fire activity on a missile range, the simulator can exercise down-range communications assets that will support the live fire event. Another growth area is training, where simulators can familiarize military personnel with the electronic warfare environment and tactics. And with all the interest in Ka band from a frequency standpoint, you can use the channel simulator to model weather impacts on Ka band signals.



**JOHN MONAHAN**  
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In 2008, John Monahan was named president of RT Logic, a wholly owned subsidiary of Integral Systems, Columbia, MD. Before joining RT Logic in 2006, he spent 20 years in the US Air Force. He also has served as a NASA Space Shuttle flight controller. Since coming to RT Logic, Monahan has served as VP of signals, navigation, and satellite test and as program manager of RT Logic signal monitoring and navigation efforts. He holds a BSEE from Villanova University and an MBA from the University of Houston.

Contributing editor Larry Maloney conducted a phone interview with John Monahan about RT Logic's communications-test and signal-monitoring technologies.

John Monahan answers more questions on communications test and