

## Technology: COMPOSER: Mission Driven Operational Realistic Communications Effects Simulator

### “The Best Laid Plans...”

#### Introduction

John Steinbeck observed in *Of Mice and Men* that “The best-laid plans of mice and men often go awry.” Consider the rapid pace of modern Net Centric Warfare and the dynamic behavior and hostile environments of on-the-move (OTM) networks and any planning is almost certain to “go awry.”

That is why Lockheed Martin Advanced Technology Laboratories (ATL) developed the Communications Planner for Operational and Simulation Effects with Realism (COMPOSER) under a U.S. Army Communications-Electronics Research, Development, and Engineering Center contract. COMPOSER not only helps plan communications connectivity for OTM forces, but can also monitor, update, and identify fixes if the original communication plan begins to break down.

As military units move, their network infrastructure changes in response to battle-field dynamics, terrain, and logistics. COMPOSER gives warfighters the ability to better predict network performance, and once on a mission, allows the warfighter to check plans against actual conditions and replan as necessary. The ability to quickly simulate, test, and

operationally configure the network is essential for reliable connectivity and continued communications for highly mobile, large-scale, OTM networks.

And, COMPOSER is fast. In recent tests, COMPOSER simulated a network of more than 2000 radios more than 600 times faster than real-time. This means that communications managers can anticipate breaks in a network and plan fixes before the projected communications failure becomes critical.

#### Innovative Approach

Future Force networks will be multi-tiered (space, air, and terrestrial) with nodes operating within and across these tiers. Current network simulation tools cannot efficiently model or visualize large-scale networks for real-time OTM planning purposes.

ATL is using its widely accepted, faster-than-real-time simulator—CSIM—to produce a Communications Effects Simulator (CES) and Network Visualizer (NV) for COMPOSER.

The CES and NV architecture provides rapid planning and intuitive visualization capabilities to perform “what if” analyses, sensitivity studies, fault-tolerance analyses,

simulation, elements of the detailed mission plan, including equipment, terrain, routes, etc., are input into the CES using the intuitive Scenario Entry Tool. The CES quantifies and refines



The Scenario Entry view is the basic tool to load the detailed mission plan, including terrain and mission equipment into COMPOSER.

and other important functions that increase the robustness of the network plan.

The CES provides pre-deployment planning and deployment re-planning capabilities needed for predicting and adapting the network configuration during the course of a mission. For pre-deployment

expected network operations, identifying hotspots and broken links in tentative plans.

Associated planning tools can generate alternative plans for configuration settings for relevant network resources, detailing the deployment of communicating nodes and the placement of network service points. During deployment COMPOSER receives input from real-time network monitors, proactively displaying alerts when a problem is detected.

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