**UNITED STATES ARMY
SPACE AND MISSILE
DEFENSE COMMAND**

Future Warfare Center

Space One Semi Automated Forces (OneSAF) Co-development Lab

Relevant Orbit Segments

Summary

- SMDC leads Space Modeling and Simulation Focus Area Collaborative Team to determine space improvements to Army M&S

- SMDC stands up OneSAF Co-development Lab to make space improvements

- Development efforts under way: Space Communication; Space Based Intelligence, Surveillance and Reconnaissance (ISR); and Joint Blue Force Situational Awareness

Improving space representation in One Semi Automated Forces

The Space Modeling and Simulation (M&S) Focus Area Collaborative Team (FACT) addresses space representations deficiencies within Army M&S. The FACT determined the space voids in simulation and identified relevant Space M&S activities requiring modification. Many of these activities focused on One Semi Automated Forces (OneSAF) Objective System (OOS), the Army's next generation Computer Generated Forces simulation, so the U.S. Army Space and Missile Defense Command (SMDC) stood up a OneSAF Co-development Lab in August 2005 to aid in the development of these improvements. Improvements are currently under way for Space Communication; Space Based Intelligence, Surveillance and Reconnaissance (ISR); and Joint Blue Force Situational Awareness.

Space One Semi Automated Forces (OneSAF) Co-development Lab

The Space Modeling and Simulation (M&S) Focus Area Collaborative Team determines Space M&S modifications. Many of these modifications are needed in One Semi Automated Forces (OneSAF) Objective System (OOS), the Army's next generation Computer Generated Forces simulation being developed by the Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI). OOS can represent a full range of operations, systems, and control processes from the individual combatant and platform level to fully automated Blue Force (BLUFOR) battalion level and fully automated Opposing Force (OPFOR) brigade level. To aid in the space developments in OOS, in August 2005, the U.S. Army Space and Missile Defense Command (SMDC) stood up a OneSAF Co-development Lab.

The Space OOS Co-development lab consists of Integrated Development Environment servers, development stations, DOORS for Configuration Management and support simulations to include Space Server, Advanced Warfighting Simulation (AWARS), and Composer. Both Linux and Windows versions of OOS are available. Space-developed OOS components are submitted into the OOS baseline in coordination with PEO STRI. The lab also provides access to OOS for demonstrations, training activities, etc.

Current Activities:

The Space Communication activity is a joint effort with SMDC and the Communications Electronics Research Development and Engineering Center (CERDEC). To address space effects on communication, the Space Communications Effects Federation (SCEF) was developed. It integrates space communications effects into simulations, creating a more realistic Battle Command simulation environment. The SCEF consists of SMDC's Space Server to represent the satellite constellation, CERDEC's Communications Effects Simulator (CES) Suite to provide the communications network and effects, and OOS serves as the scenario driver. The initial capability of the SCEF focuses on connectivity and bandwidth of space based communications systems.

Space-based Intelligence, Surveillance and Reconnaissance (ISR) Systems are also being incorporated into OOS by implementing a space mobility behavior for ISR satellite entities in OOS. Including space-based ISR representations in OneSAF allows the intelligence cycle to create an updated Common Operating Picture (COP) that includes data from "outside" the OneSAF unit-of-interest play box. This enables OOS to support the intelligence battlefield operating system tasks, conduct ISR, support to situational understanding, support to effects, and support to strategic responsiveness. This effort models satellite access and sensors with implicit modeling of the intelligence request for information process to respond to the commander's Priority Intelligence Requirements. The space mobility behavior is a non-propagation prediction of satellite over-flight "events," representing a high density of satellites without the computational overhead. A database of sensors for the ISR satellites is also in development. The initial satellites are commercial and include the U.S. systems: Landsat, Quickbird, and Ikonos; the French Satellite Pro-batoire d'Observation de la Terre (SPOT); and Indian Remote Sensing (IRS) satellites.

The Joint Blue Force Situational Awareness (JBFSA) OOS effort models the transmission, reception and behavioral effects of deployed Blue Force Tracking (BFT) devices and each domain required to fuse the devices' information. This will be done by determining which BFT devices can transmit and fuse their location and information into the combatant command COP. Then, the capable satellite segments of the JBFSA's system will be determined to establish an accuracy rate and data transmission refresh rate. This will also replicate the capabilities of the Space-Based BFT Mission Management Center and simulate operating capability of the Special Operations Forces community's Miniature Transmitter, Grenadier Beyond Line of Sight Reporting and Targeting (BRAT), and other Collection of Broadcasts from Remote Assets (COBRA) devices whose signals are collected by National Technical Means and Line of Sight receivers. This will result in simulating the generic capability of currently deployed BFT devices.

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