JCATS LOW OVERHEAD DRIVER

(JLOD)

CAPABILITIES BRIEF

DISCLAIMER

JCATS Low Overhead Driver (JLOD)

Capabilities Brief

The purpose of this document is to provide a brief description of the JCATS Low Overhead Driver (JLOD) model including background, usage, and major capabilities.

Overview

The Department of Defense (DoD) continues to demand a consistent and immersive training environment that reflects the growing complexity of the military operations. To be effective, the training environment must adapt to the changing threat, tactics, and equipment for all levels, all services, coalition partners, and non-governmental agencies. No one system today satisfies all these needs. However, networking a collection of simulations (i.e., a federation) is a logical and cost-effective training environment that leverages the strengths of a wide variety of models to provide high-value training for the DoD.

JLOD is sponsored by the DoD Joint Staff, J7, and Suffolk, Virginia and is currently used by JS J7, USMC, MSTP Quantico, VA, JMSC/EUCOM, NATO, and Australia. JLOD has become JS J7's primary model to visualize federation play in the JLVC federation.

 JLOD is a joint multi-sided, real-time, high resolution, interactive simulation that models force interactions on a global level down to the individual soldier. The current released and supported version of JLOD is V5.0.0.   JLOD is designed as a White Cell tool to visualize federation play and to provide both wrap around and automated signatures for JCATS and the Joint Live Virtual Constructive (JLVC) federation. JLOD provides worldwide representation of on-going operations in support of distributed events using HLA as its backbone and generates position and other tactical message information for stimulation of C4I systems. Currently, JLOD is JLVC-focused and is designed to portray large entity counts and entity movement for military and civilian operations. JLOD also has a stand-alone Planner tool that enables operators to plan orders in parallel to an ongoing exercise, ensuring order correctness and proper signature generation before they are injected into the exercise.

JLOD is a constructive, agent-based simulation that provides Joint multi-service interoperability and is capable of conducting activities from tactical to multi-regional conflicts at the operational level. The JLOD play box is the entire world (planet Earth). Its entity count is limited only by the hardware and network employed and as such; JLOD can essentially play an unlimited number of entities. JLOD entities are defined as follows:

- **Physical entity**: An individual system

- **Roster entity**: A Unit with a list of subordinates

- **Population entity**: A group that has a list of implicit entities that includes both personnel and equipment.

- **Agents**: An entity or Unit that controls its own movement. For example, a Brigade defined in the OBS XML file that has all of its subordinates merged into the Brigade will

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show the Brigade as an Entity Roster and itself as the Agent. The Brigade subordinates will show that their Agent is the Brigade. However, if a subordinate is split from the Brigade, it will show itself as its own Agent because it is now capable of receiving independent orders and executing movement on its own.

These agents and rosters can be played exclusively in JLOD only, or may be activated /deactivated in the HLA environment and published as observable entities in the HLA federation.

- **Examples of JLOD Simulation Uses**Combatant Command (COCOM) Joint Training
- Coalition Training
- Peacekeeping
- Counterterrorism
- Counterdrug
- Civil Support
- Crowd Control
- Logistics
- Area Security
- Intel driver & Stimulator
- Anti-Access & Area-Denial
- Exercise Planning

 JLOD is a low cost, low maintenance simulation that has a small foot print (PC laptop at a minimum) and self-contained editors that make it ideal for many uses. As such, JLOD provides an effective tool for supporting training, experimentation, mission planning, rehearsal activities, school house/academic use, exercises, Course of Action analysis, synchronizations, evaluations, and as a supporting system driver. The simulation can be run in real-time or faster, and started and paused on demand.

JLOD is also able to link with other simulations and simulators by using standard High Language Architecture (HLA) standard and bridges. The current released version of JLOD uses JLVC V1.0 FOM or IEEE RP2 Modules Base, Physical, Aggregate, and Warfare. It supports multiple RTIs with 1516E API for NG-Pro V8.0, Pitch, RTI-S, and MAK. This allows JLOD to be federated with large numbers of other simulations for specific purposes, for example, linking with an Air Force high resolution air-to-air combat simulator and first person 3D models. It can link to real players in a training area and show their locations and actions as a part of the game play on the JCATS/JLOD screens. As a result of JLOD capabilities, it has operated in a combined live/virtual/constructive environment for large military exercises that include all branches of military services for JS J7 since 2007. JLOD is routinely used by JS J7 for federated

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exercises running the simulation on a single computer and launching several workstations locally or to multiple locations around the world.

JLOD is a client-server system which runs on networked PCs using the Linux operating system. JLOD V5.0.0 currently runs on Red Hat Linux Enterprise 6.8 as its supported operating system. JLOD does not support any other versions of Linux. JLOD is most commonly configured to run on a single network.   However, the model does have the capability to run a simulation on multiple LANs. These LANs can be separated geographically or within the same location. Again, this makes JLOD an excellent tool for conducting business by enabling users to reduce cost and save resources for training, exercises, etc.

Terrain Capabilities

JLOD plays the entire Earth. JLOD loads and uses the elevation data from the JCATS terrain for a given exercise to display and use the JCATS roads and the DTEDs elevation data for ground clamping purposes in federation play.

JLOD supports the importing of Compressed Arc Digitized Raster Graphics (CADRG), Geo-referencing Tagged Image File Format (GeoTIFF), and Controlled Image Base (CIB) data to produce raster maps used to wrap around a smooth JLOD earth.

Examples of Some Major Simulation Capabilities with JLOD

- Generates position & other message information for Stimulation of C4I systems & Virtual models

- Use of JCATS data files & Joint Training Data Services (JTDS) for scenario builds

- Inclusion of entire Earth in model

- Ability to read JCATS elevation data & roads

- Unlimited entity count (hardware & network restricted)

- Dynamically activate & deactivate forces

- Detailed emitter & communication signatures

- TBM & Cruise Missile support

- Convoy operations

- Air, Sea, Rail, Ground movement modeling beeline movement

- Navigation (pathing)

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- Damage from direct & indirect fires

- Logistics operation support & consumption

- Ability to display JCATS CAC graphics & Checkpoints

- Ability to transfer systems and units between JCATS & JLOD

- Ability to display and publish into the federation DMPIs & Facilities

- Population modeling (Virtual Patterns of Life)

- Population modeling that can be acquired and affects movement in the JLVC.

- Dynamic unit creation

- Enhanced Integrated Air Defense networks to acquire using active/passive radars and transferring C2 responsibilities to alternate C2 Nodes

- Low network bandwidth required for JLOD Simulation and Workstation communication

- Engineering obstacles play (wire, land mines, sea mines, ditches, etc.)

Summary

This document highlights some of the major capabilities of JLOD. There are many more features and applications of this model. Questions regarding the details and acquisition of JLOD should be directed to the Conflict Simulations Laboratory at Lawrence Livermore National Laboratory at phone number (925) 424-5654 or (925) 422-2052.