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Research Report 1884

Exploring the Potential Value of OneSAF at the Small-Unit Level

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OneSAF (one semi-automated force) provides intelligent, doctrinally-correct behaviors representing the modular force in the contemporary operating environment. The research determined the extent to which OneSAF (v1.0) could assist company and platoon leaders with tactical planning and assessed the potential value of using OneSAF in institutional training to train course of action (COA) development, analysis, and comparison. U. S. Army officers with combat experience participated. A Quick Start Guide was developed to assist with hands-on training during the experimental sessions. Results indicated that OneSAF could be a useful tool in training mission planning to company-level officers during institutional courses. OneSAF features were perceived to assist with learning COA development, analysis, and comparison, and to support the major factors viewed as valuable in operational planning. The major challenge to future versions of OneSAF is to make it easier to use and quicker to develop scenarios, while simultaneously maintaining the in-depth simulation features.

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EXPLORING THE POTENTIAL VALUE OF OneSAF AT THE SMALL-UNIT LEVEL

EXECUTIVE SUMMARY

Research Requirement:

The U.S. Army has developed a new simulation, called OneSAF for One Semi-Automated Force, that supports training, analyses, research, experimentation, mission planning, and rehearsal activities. OneSAF uses semi-automated forces that provide intelligent, doctrinally-correct behaviors representing the modular force in the contemporary operating environment. Given the capabilities offered by OneSAF, the objectives of this research were to determine the extent to which OneSAF could assist leaders at the company and platoon level with tactical planning and rehearsal, and to assess the potential value of using OneSAF in institutional training to train small-unit leaders on course of action (COA) development, analysis, and comparison.

Procedure:

Using OneSAF version 1.0, experimental sessions were conducted with a total of 15 Army officers having combat and instructional experience. Each session consisted of an introductory briefing, a demonstration of OneSAF capabilities, and hands-on training building and modifying scenarios. A Quick Start Guide, reproduced in an Appendix to this report, was developed to assist with the hands-on training. A survey was administered to document the officers' previous planning experience at the platoon and company levels, and to obtain their reactions to the potential of OneSAF.

Findings:

Results indicated that OneSAF could be a useful tool in training mission planning to company-level officers during institutional courses. OneSAF features were perceived as assisting with learning COA development, analysis, and comparison. These features also supported the defensive and offensive mission planning factors the officers identified as valuable. The officers identified OneSAF tools and capabilities that were particularly beneficial. These included the area-of-sight tool, line-of-sight tool, distance tool, ultra high resolution buildings, go to coordinates tool, and the layer control tool. However, the officers believed that the detailed, time-consuming requirements to develop, execute, and compare COAs in OneSAF v1.0 rendered it not usable for Infantry company and platoon leaders in a time-constrained, often austere, tactical field environment. The major finding emerging from the research was how to design the future versions of OneSAF so they are more user-friendly and scenarios can be developed more quickly, while maintaining the simulation's depth, complexity, and flexibility.

Utilization and Dissemination of Findings:

The findings from this initial research can help guide follow-on training and mission planning research with later versions of OneSAF. The Quick Start Guide is a model for helping

new users acquire skill in using OneSAF. Finally the research provides insights into what officers find most useful in such simulations and how OneSAF could be made more user-friendly for training and operational applications at the small-unit level.

EXPLORING THE POTENTIAL VALUE OF OneSAF AT THE SMALL-UNIT LEVEL

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EXPLORING THE POTENTIAL VALUE OF OneSAF AT THE SMALL-UNIT LEVEL

Introduction

In September 2006, the U.S. Army Program Executive Office for Simulations, Training and Instrumentation (PEO STRI) released version 1.0 of the new Army simulation software called One Semi-Automated Force (OneSAF)[1]. Designed for brigade and below combat and non-combat operations, OneSAF is a composable, next-generation, entity-level computer generated forces (CGF) simulation (PEO STRI, 2007).

The OneSAF software is a cross-domain simulation suitable for supporting training, analyses, research, experimentation, mission planning, and rehearsal activities. It is designed for use by three distinct Army Modeling and Simulation domains. Specifically, the Advanced Concepts and Requirements (ACR) domain uses OneSAF for experimentation and analyses on Army doctrine and force-related concepts. The Research, Development, and Acquisition (RDA) domain uses OneSAF for acquisition analyses focused on equipping and supporting currently fielded and future forces. The Training, Exercises, and Military Operations (TEMO) domain employs simulations to train the force using live simulation (actual equipment on training ranges), virtual simulation (immersing Soldiers into a synthetic environment), and constructive simulation (war games using computer generated forces) (Surdu & Parsons, 2006).

OneSAF is targeted to replace several existing simulations and/or the CGF in simulations: Brigade/Battalion Battle Simulation (BBS), Janus, Close Combat Tactical Trainer (CCTT), Aviation Combined Arms Tactical Trainer (AVCATT), and the urban operations capabilities of the Joint Conflict and Tactical Simulation (JCATS). In addition, OneSAF will be part of the embedded training common components for the Future Combat Systems (PEO STRI, 2007).

Integral to the OneSAF simulation is the CGF model that provides intelligent, doctrinally-correct behaviors representing the modular force at the entity and unit level. The latest version of the simulation provides a unique ability to model unit behaviors from fire team to Brigade level for all units across the spectrum of military operations in the contemporary operating environment. The simulation has the capability to model more than 25 different opposing, friendly, unknown, and neutral sides and forces, with asymmetric side relationships, in order to more accurately reflect the contemporary operating environment. As an example, in OneSAF it is possible to model two tribes that are both friendly to a side or force, but are enemies toward each other. In addition, OneSAF can model a side that the friendly force sees as unknown on the battlefield, but that force behaves as though it is an enemy (PEO STRI, 2007). These relationships are defined by the scenario developer.

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[1] Version 1.0 was called the OneSAF Objective System and abbreviated as OOS. However, later versions of the software are called "OneSAF." The phrase "OneSAF" is used throughout this report to be consistent with future software releases. However, since all the training materials were generated using the "OOS" label (the name of the version of the software used in the research), the phrase "OOS" is retained when referring to the training support materials and the surveys used in the research.

This initial research with OneSAF had two purposes. One purpose was to determine how OneSAF could be used in an institutional training environment and at what echelon it would be most valuable for use in training. We thought that OneSAF would be useful to small-unit leaders in visualizing or developing course of actions (COAs), as well as assisting in analyzing and comparing COAs. The second purpose was to determine the potential value for small-unit leaders at company and platoon levels to use OneSAF for mission planning and rehearsal in an operational setting. Based on the possible uses of OneSAF by small-unit leaders, we wanted to determine which features within the simulation are perceived as most valuable. Additionally, it was of interest to know the types of capabilities users might desire in such a simulation.

It is important to note that the research focused on a different application than that which is envisioned in the TEMO domain. The TEMO applications typically are large-scale simulation exercises (battalion and brigade) that may be conducted in conjunction with virtual simulations and live exercises. With large scale simulations, the overall scenario planning is often conducted by battalion-level leaders, and typically individuals under their command manipulate the software in order to develop and execute the actual simulation scenario. There is no intent to train leaders on their planning skills per se or to have them make the detailed decisions necessary to execute a scenario. In contrast, our research focused on the potential of OneSAF to increase the planning skills of small-unit leaders (company and platoon) and to determine the advantages of using OneSAF in operational environments at the small-unit level. As such the small-unit leaders participating in the research were required to not only plan the overall scenario, but to be the scenario-developer as well. They had to develop and refine the plan with the scenario tools in the OneSAF software, and finally "run" the scenario to see the results of their plan. OneSAF's tools require very detailed and precise decisions on part of the scenario-developer. In that process, the small-unit leaders had to consider many factors. If a critical factor was not considered or addressed appropriately, the scenario would not run.

The research approach was to quickly train-up officers with command experience on OneSAF (OOS version 1.0), have them develop their own scenario, followed by an assessment and opportunity to comment on the potential of OneSAF for institutional and small-unit operational applications. In addition, information on the officers' background in military planning and use of other military simulations was obtained.

A cautionary explanation is necessary to ensure the results of this early examination are presented in the proper context. This research used OOS software version 1.0; version 1.5 of OneSAF was released in August 2007 after the current research was completed. Our project only examined a limited set of the features and capabilities available in this version of OneSAF. The areas examined were deemed most likely to be employed at the company level and below. In addition, time constraints limited the scope and depth of the features that could be examined.

Method

Participants

The initial target audience for the research was small group instructors (SGIs) from the Maneuver Captains Career Course (MCCC). These individuals, typically at the rank of major

and captain with prior company command experience, were considered to have the necessary operational and institutional experience to provide feedback on OneSAF functions and capabilities for operational mission planning and for use in institutional training. However, due to competing requirements, only a limited number of SGIs was available to participate. Consequently, it was necessary to obtain other officers with the appropriate operational and training experience. The final sample was small and represented diverse military backgrounds.

A total of 15 Army officers (5 Captains and 10 Majors) participated. All were assigned at Fort Benning; 11 as staff and faculty for the Infantry School and Center and four were Captains who had just completed the MCCC. One officer was a retiree with over 20 years of active military service as an Infantryman. All others were still active duty. The Captains had been in the Army a mean of 8.5 years, and had served in their current grade for a mean of 2.2 years. The Majors had been in the Army a mean of 17.9 years and had served in their present grade for a mean of 3.0 years.

The majority of the officers (67%) served in combat in Operation Iraqi Freedom (OIF) or Operation Enduring Freedom (OEF) between 2001 and 2007. One officer served twice in OIF, while another served two tours during OIF in addition to Operation Desert Shield/Storm and Operation Just Cause in Panama. The mean time spent in these combat zones was 11.7 months, with a range of 1 to 25 months. The officers held a variety of positions while in the combat zones, with eight serving as a platoon leader, company executive officer, or company commander.

Twelve officers had prior Infantry experience at the platoon and company levels in a combination of units including light, mechanized (M113 Armored Personnel Carrier and Bradley Fighting Vehicle [BFV]), and Stryker units. The other three officers, two Captains and one Major, had Ordnance, Engineer, and Quartermaster experience at the platoon and company levels.

All officers had been platoon leaders with a mean time of 16.6 months. The type of platoon ranged from an Infantry platoon (4 Light, 6 BFV, 2 M113, and 1 Air Assault), to a maintenance platoon and a water purification platoon. Twelve had been company commanders, with a mean of 27 months in command. Nine commanded an Infantry company (4 light, 1 BFV, 1 M113, and 3 Stryker), two commanded Initial Entry Training companies, and one commanded a Quartermaster company.

Survey

Knowing the officers' experience with mission planning at the company level and below and prior experience with simulations was necessary to assist in analyzing feedback provided on OneSAF. To capture this background information, officers completed the initial two sections of a survey instrument (see Appendix B) before being exposed to OneSAF.

Section I of the survey captured the basic biographical information presented above as well as level of experience with training and exercise simulation systems. Section II captured information on the officers' planning experience. Questions addressed both platoon and

company levels and used the eight-step Troop Leading Procedure (TLP) that is the foundation for planning at the company level and below (Headquarters, Department of the Army [HQDA], 2005). A group of questions focused on Step 3 of the TLP (Make a tentative plan) and required the officers to identify the value of various defensive and offensive planning factors.

Following the OneSAF demonstration and training session, the officers completed the remaining two sections of the survey which focused on OneSAF. Section III concentrated on how OneSAF functions could enhance or assist in the planning steps contained in Step 3 of the TLP, as well as the ease, usefulness, and complexity of the OneSAF software. Section IV, the final section of the survey, asked for comments on the potential value of using OneSAF in institutional training.

Procedure

Seven data sessions were conducted in order to accommodate the officers' schedules. Six sessions were conducted in the Army Research Institute's (ARI) Warfighter Experimentation Laboratory (WEL), and one session was conducted in an MCCC classroom. A "Quick Start Guide" was developed and used to assist with the hands-on training segments. Each session consisted of:

- Introductory briefing to address purpose and events for session
- Sections I and II of the survey
- Demonstration of OneSAF (OOS v1.0) capabilities
- Hands-on training building a scenario
- Hands-on training modifying a scenario
- Sections III and IV of the survey

The seven separate sessions were conducted over a span of 76 days. The number of officers in each session varied based on availability. One session had four officers; one session had three officers, three sessions had two officers, and two sessions had only one individual. Except for one session, the Captains and Majors attended different sessions.

Session Segments and Sequence of Events

Session time. Each session varied in length. Variations in time were attributed to the number of officers participating in the session, the level of familiarity they had with computers and simulations, and the amount of interest they expressed about OneSAF (e.g., quantity and complexity of questions asked). Table 1 depicts the breakout of time for each of the major portions of the data sessions. Mean time across sessions was 5 hours.

Introductory briefing. The introductory briefing was a PowerPoint presentation designed to provide a general overview of OneSAF and its capabilities, the purpose of the research project, the plan of events for the session, and an opportunity to ask general questions.[2] Following the briefing, officers completed the first two sections of the survey.

[2] The briefing initially consisted of 12 slides that was later shortened to a 4-slide version merely stating the purpose and planned events for the data gathering session.

Table 1
Amount of Time (minutes) by Session Segment

Session Segment	Session #							
	1	2	3	4	5	6	7	**Mean Time**
Introduction and Demonstration [a]	68	39	91	55	50	89	35	61
Scenario Building	109	111	88	126	127	105	78	106
Scenario Modification [a]	114	165	150	74	153	117	119	127
Total Time	291	315	329	255	330	311	232	294

[a] Includes approximately 10-15 minutes to complete portions of the survey.

Demonstration. The OneSAF demonstration segment provided an initial overview of the OneSAF processes and established a framework for building a scenario. The demonstration directed the officers to the overall concept of what OneSAF could do; no details of how to create a scenario were covered at this time. The demonstration also oriented the officers to the user interface, explained the functions of the various display windows, and gave an example of how a completed scenario would run.

The scenario used for the demonstration was an urban environment raid on a suspected terrorist bomb-making facility, which was representative of a mission in the contemporary operating environment of OIF/OEF. The terrain database for the mission was the Shuggart-Gordon urban site in the Joint Readiness Training Center (JRTC) database. The friendly forces consisted of a Stryker Infantry Company and an OH-58D Kiowa Warrior Company. The opposing forces consisted of a group of eight terrorist bomb makers located in a two-building objective in Shuggart–Gordon. The scenario demonstrated the movement of the friendly forces from designated assembly areas to positions surrounding the objective site and then one platoon assaulting the objective to subdue all targets. During the demonstration the instructor showed various tools and capabilities within OneSAF that the officers would use during hands-on training and practice sessions.[3]

Hands-on training building a scenario. This hands-on training focused on the steps required to create, save and run a scenario. Each session followed the same general sequence of scenario-building steps as outlined in the Quick Start Guide (explained below). The amount of time for each step varied based upon the number of officers present, their abilities to manipulate and understand the OneSAF interface, and the amount of questions from the officers. Two instructors assisted the officers. One instructor explained how to use the simulation and assisted the officers when the steps became unclear. The other instructor assisted when necessary and recorded notes of comments as they pertained to the simulation.

This training segment was modified based on the feedback from the initial session. The intent was to allow officers to learn all of the required steps to create a scenario, and to reduce the overall time spent presenting this hands-on training. Modifications included eliminating the placement of the OH-58D Kiowa Warrior Company, limiting the placement of movement routes

[3] The demonstration was modified slightly after the first session from focusing on the micro level of OneSAF capabilities to focusing on the macro level, deferring a more detailed explanation of capabilities to the hands-on training segments.

from the entire Stryker Company to one platoon of Strykers, and reducing the opposing force from an eight-man element in a two-building objective to a two-man element in a one-building objective. These modifications still allowed the officers to experience each step of building a scenario and provided sufficient time to modify their scenario before ending the data session.

The scenario building training included the following functions: start-up procedures (open a scenario), selecting/loading the terrain database, selecting and placing forces on the map, configuring forces to match a desired task organization, using scenario development tools, placing control measures on a map, assigning missions to entities and units, and lastly running a scenario. These functions were taught using a simultaneous demonstration and practical application method of instruction. The instructor demonstrated and talked through the steps related to these functions using the Quick Start Guide and a visual projection of the software. The officers followed along, executing the steps using the Quick Start Guide as a reference.

Most of the training time focused on the major functions and associated steps in creating a scenario: selecting the forces and plotting them on the map, configuring the force, refining the plan using scenario development tools such as line-of-sight, applying control measures, and lastly, developing the execution or synchronization matrix for the scenario. Mean time to train each functional area was 20 minutes.

Hands-on training modifying a scenario. The focus for this segment was to determine the ease of use and value of OneSAF by allowing the officers to modify the scenario based on their military experience. Each individual, with the assistance of the instructors, was encouraged to modify the scenario to represent an actual situation that the officer was involved in either during the execution or planning phases of a mission. The officers were told to work with OneSAF until they reached a point of saturation and were able to offer appropriate feedback about the systems' capabilities. Over all sessions, the time to modify a scenario was two hours (see Table 1). Following scenario modification, the officers completed the final two sections of the survey.

Locations and Equipment

All computers used in the research conformed to the minimum hardware requirements for OOS v 1.0. These requirements were 120 GB hard drive, 2 GB of RAM, and a 2.4 GHz processor.

Six data sessions occurred in the ARI WEL. It is a flexible simulation environment in which researchers can examine proposed and evolving tactical technologies and innovations (Livingston, Root, Mast, & Gilbert, 2005). Each participant used a Dell desktop computer with 2GB of RAM and a CPU processing speed of 3.2 GHz. The instructor used a Dell Latitude D410 laptop with 2 GB of RAM and a CPU processing speed of 2.1 GHz, which was connected to an InFocus projector. The WEL was laid out in a horseshoe configuration with the officers facing outward; their computer monitors were visible to the instructor. With this arrangement, the instructor could monitor progress and intervene as needed.

The last session was conducted in a classroom where the MCCC course is taught. Three Dell Latitude D410 laptops were used. One computer was connected to an overhead projector for the demonstration portion of the session; each of the other two computers was used by an officer. The layout for this session differed significantly from the ARI WEL. The officers were located in a position that impeded the instructor's ability to monitor their progress. The instructor was not able to observe their actions, which contributed to the building of incomplete scenarios and limited modifications to the existing scenario.

Quick Start Guide

The Quick Start Guide (see Appendix C) was developed as a tool to assist in teaching the officers how to build the demonstration scenario and as a reference during the hands-on phases, when they created scenarios and had to apply OneSAF functions and capabilities. The Guide included the basic OOS v1.0 steps needed to develop, run, and determine the outcome of a scenario (Figure 1). Screen shots in the guide captured the key processes for each function.

Table of Contents

1.....Start-Up

3.....Open a New Scenario

5.....Saving a Scenario

7.....Locate, Select, and Load the Terrain Database

10.....Select and Place Forces on a Map

14.....Configure the Force to Match a Desired Task Organization

18.....Scenario Development Tools

22.....Place Control Measures on a Map

26.....Assign Missions to Entities and Units

32.....Run a Scenario

34.....Determine Outcome of Scenario

36.....Stop and Reload a Scenario

38.....Shut Down Procedures

Figure 1. Table of contents for the OOS Quick Start Guide.

Screen shots in the Guide came from various sections of the software display windows (e.g., the Plan View Display, Mission Editor, Status, and Task Organization). Some images were simple and direct, such as showing the user the appropriate icons to select to start the OneSAF program (see pages C-6 and C-8). The complex functionality of the OneSAF software is apparent in its multi-screen programming environment and highlights the need for streamlined

training protocols. Appendix C (page C-9) provides an example of the first window displayed when building a new scenario, a procedure that could be confusing to a new user. Other screen images illustrate the linkage between selected menus and tables that are displayed in multiple windows. This layout requires the use of various toolbars with numerous icons in order to complete a single function. Pages C-31 through C-36 show the numerous steps involved in assigning missions (also referred to as tasks and behaviors in OneSAF) to entities and units.

In some cases, the graphic images from the screen shots were tailored to highlight the key interface buttons or icons that the user would need to execute a particular function. Text, highlighting, and arrows were used to describe and prompt the user on what steps should be taken (see an example in Figure 2).

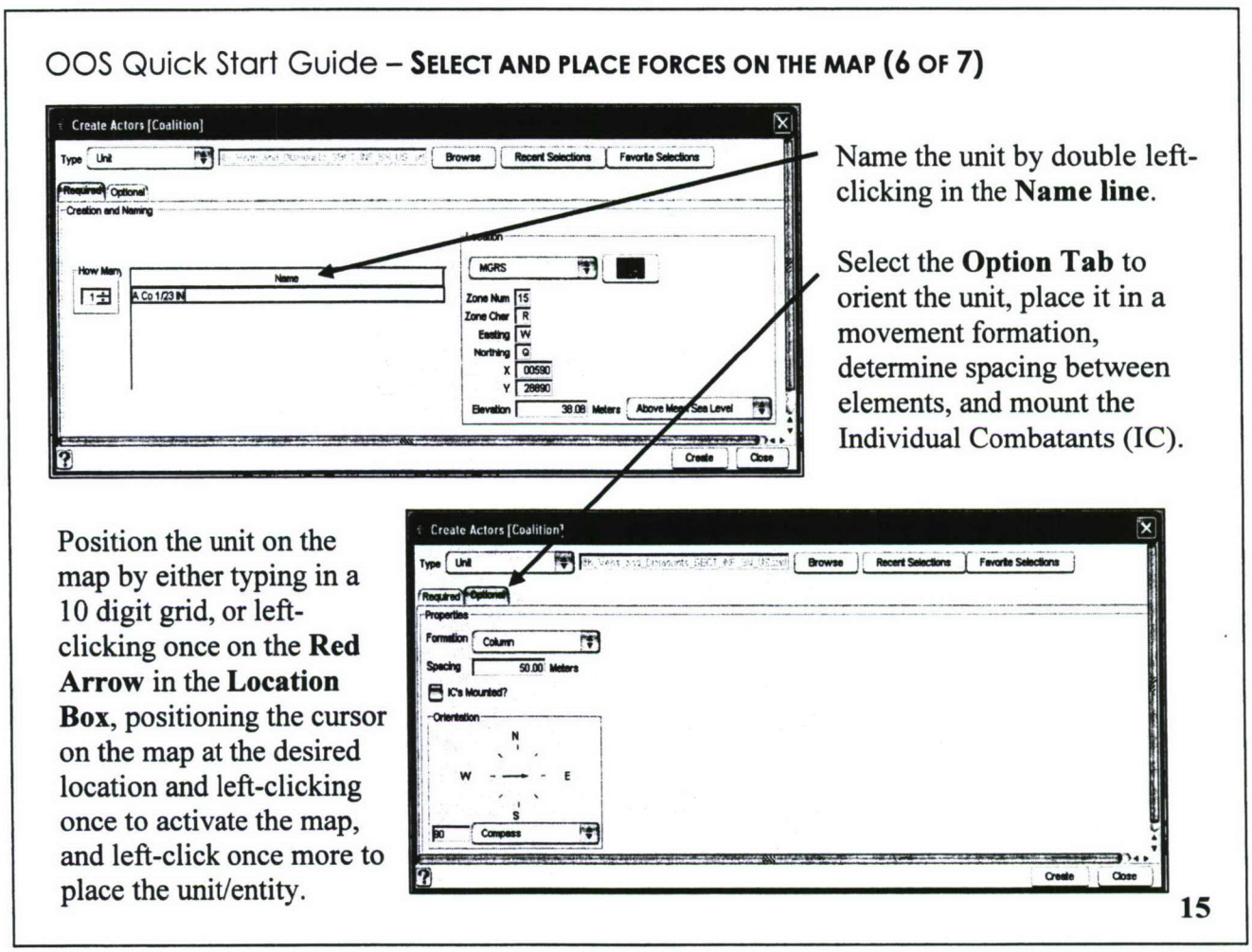

Figure 2. Example page from OOS Quick Start Guide.

Following Session #1, the Quick Start Guide was modified. The major changes included adding an overview of the screens the user would encounter at the beginning of the Guide and including three new sections: scenario development tools (line-of-sight and area line-of-sight)

stop and reload a scenario, and saving a scenario. Minor changes included clarifying steps in some sections and adding more detailed steps for some tools.

Limitations of the Research

As mentioned above, the research effort only included selected capabilities within OneSAF; the instruction focused on the capabilities that would allow the user to build a simple scenario using Infantry Company level and below units and entities. The capabilities selected and the subsequent amount of instruction impacted the feedback from the officers. In addition, the demonstrator for this project was a self-trained individual with no previous OneSAF experience and did not have the in-depth software programming background to explain all aspects of the simulation.

Of particular note is that OneSAF offers a capability to develop some inputs using the Military Scenario Development Environment (MSDE). The MSDE is a PC-based PowerPoint application that allows a more user-friendly selection of forces and development of selected simulation exercises in an effective, efficient manner. However, we chose not to use the MSDE capability because it was not fully developed in OOS v1. Therefore, our research used the Management and Control Tool (MCT) environment in the simulation to create the scenario and to make modifications. Even with OneSAF v1.5 (a later version), the MCT must be used to complete a scenario as not all scenario development tools and behaviors are in the MSDE.

Lastly, a specific OneSAF function not addressed in this research was the after action review (AAR) capability. It was not included because of time constraints for the training session, and the AAR capability was not a key factor in assessing the use of the simulation for course of action analysis and mission planning.

Results

The results were derived from the surveys, observations of the training sessions, and comments made by the officers during the sessions. Results are presented in four sections: background information including the officers' simulation and planning experience; the potential use of OneSAF to assist with tactical planning; factors impacting OneSAF training, and the use of OneSAF as a means of enhancing mission planning periods of instruction in institutional courses.

Simulation and Planning Experience

The officers' prior simulation and planning experience was determined as we thought these factors could affect reactions to OneSAF. For example, individuals with limited planning experience might find it difficult to judge the value of OneSAF. Individuals with limited simulation experience would find comparisons on other simulations hard to make. This section presents description information on the officers' background in these areas.

Simulation Experience

Officers were queried about their prior simulation experience as this might influence their perceptions of OneSAF's difficulty and/or value. The officers characterized their experience with eleven training and exercise simulation systems using a five-point scale ranging from "used extensively" to "no experience" (see explanation of scale ratings in the survey at Appendix B, Part I, question #4). Table 2 shows the responses to each simulation.

Considering all simulations, the majority of the officers (73%) indicated they had no experience with the simulations. In addition, three officers stated they had no experience with any of the simulations. More officers had experience with Janus and JCATS than the other simulations. One officer, with an additional specialty of Operations Research and System Analysis, had used both BBS and Janus extensively

Table 2
Officers' Prior Simulation Experience

Simulation	**# of Officers**			
	Used Extensively or Routinely	Used on Limited Basis	Exposed to Simulation	No Experience
Janus	1	5	4	5
JCATS	1	5	3	6
BBS	1	3	2	9
CBS	0	1	3	11
SVS	1	1	2	11
DARWARS	0	0	4	11
OOS (prior exposure)	0	0	3	12
OneSAF OTB	0	0	2	13
TACSIM	0	1	1	13
Language and Cultural Training	0	0	1	14
TacOps	0	0	0	15
Mean # Officers	0.36	1.45	2.27	10.91

BBS – Brigade/Battalion Battle Simulation
CBS – Corps Battle Simulation
Janus – noncommercial battle simulation
JCATS – Joint Conflict & Tactical Simulation
OneSAF OTB – OneSAF Testbed Baseline
SVS – Soldier Visualization Station
TACSIM – Tactical Simulation
TacOps – commercial wargame simulation; multiplayer
DARWARS – various simulation components from the Defense Advanced Research Projects Agency
Language and Cultural Training – simulation to assist in learning Iraqi or Pashto

Planning Experience

Platoon planning experience. When planning for a mission, time often becomes a critical factor. Leaders attempt to allot at least two-thirds of the available time to subordinate units for their planning, but circumstances frequently have a way of reducing the planning time provided to subordinates. Being at one of the lowest echelons in the unit structure, platoon leaders usually

receive the least amount of time to conduct their planning. They usually rely on platoon and company standing operating procedures (SOPs) and battle drills to execute the mission. The survey responses confirmed this situation. No officer indicated that their company commander provided more than two-thirds of the time for planning when they were platoon leaders. Six stated their company commanders attempted to provide two-thirds of the time, while seven stated that the time available was usually one-half or less. The other two officers noted that their company commanders planned for them.

Platoon leaders must prioritize their effort when given limited time to plan. One concept used most often is the visualization of the plan. All but one of the 15 officers (93%) agreed that visualization of a COA (on a map, in a digital system, using a terrain model, a sketch on a note pad or in the dirt) assists in the development, analysis, and understanding of a mission. Visualization of a COA, coupled with the TLP steps, allows the unit to execute operations when placed in a time-constrained environment. OneSAF could be useful to small-unit leaders in developing COAs, and in analyzing and comparing options. Table 3 shows the ratings officers assigned to TLP steps, based on their experience as a platoon leader.

Table 3
Importance and Helpfulness of Troop Leading Procedure Steps/SubSteps as a Platoon Leader

TLP Steps/SubSteps	**Rating: # Officers**			
	Critical/ Essential	Needed	Helpful	Not helpful or not used
1. Received the mission.				
a. Began an analysis of the mission using the factors of METT-TC [a].	8	6	1	0
b. Scheduled your work in the time available.	7	5	3	0
2. Issued a warning order.	9	5	1	0
3. Made a tentative plan.				
a. Conducted a detailed mission analysis.	4	5	6	0
b. Conducted situation analysis & developed COAs.	4	5	6	0
c. Analyzed each COA.	0	3	9	3
d. Compared the COAs.	0	1	9	5
e. Made a decision on the best COA based on your current estimate.	5	2	4	4
4. Started necessary movement.				
5. Conducted a reconnaissance.	6	3	6	0
6. Completed the plan.	6	8	1	0
7. Issued the order to your subordinates.	12	3	0	0
8. Supervised preparations for the mission.				
a. Conducted rehearsals.	7	6	2	0
b. Conducted inspections/re-inspections	11	2	2	0

[a] METT-TC: Mission, enemy situation, terrain, troops available, time available, and civilian considerations.

Of interest is that TLP steps related to COA analysis and comparison (substeps 3c, 3d and 3e in Table 3) were rated as being the least essential/helpful or not used, based on the officers' personal experience as a platoon leader. The limited planning time for platoon leaders may have contributed to the limited use of COA at this echelon. An alternative to a "formal" COA analysis was cited by one officer, who indicated it was critical to incorporate flexibility into the single COA developed in the unit.

Company planning experience. The officers responded to some of the same questions on planning from their experience and perspective as a company commander. As previously stated, 12 (80%) had been a company commander. A difference noted between their platoon and company experience is that, as a company commander, their higher level (battalion) commander attempted to allot them more time to plan. Of the 12 officers, the major difference at the company level was that five indicated they received more than two-thirds of the time to plan. An additional two stated they had two-thirds of the time to plan. Three noted that the time available was one-half or less. As with the platoon responses, two noted that the higher-level command planned for them.

Their company planning experience was similar to platoon planning in that sketching or drawing COAs helped to assist with visualization of the mission. All but one (92%) of the 12 officers indicated that visualizing the COA increased their ability to analyze a COA and communicate the plan to subordinates.

Platoon and company planning comparisons on making a tentative plan. Two questions were asked regarding the substeps in TLP Step 3 - Make a tentative plan. They addressed platoon and company experiences separately. The first question examined the frequency with which each substep was considered in operational planning. Background information provided for this question recognized that time constraints often prohibited addressing each step.

The second question addressed some of the specific factors leaders use to determine how they would accomplish a tactical mission. These factors were identified because they are major areas that would differ between various COAs. For example, the amount of combat power available and how that combat power is brought to bear on the battlefield will directly impact the mission outcome. Unit leaders and commanders typically consider different options for positioning maneuver forces and allocating indirect fire support, and how they might organize their force to provide the optimum command and control during the anticipated battle. Answers to both questions are in Table 4.

Responses did not differ substantially at the platoon and company levels regarding the extent to which the substeps to making a tentative plan were considered. Consistent with the data in Table 3, the two TLP substeps executed with the least frequency were analyzing and comparing COAs (see substeps highlighted in Table 4). This was particularly the case with platoon planning, as 73% of the officers indicated that alternative COAs were seldom or never not analyzed nor compared. This compares to fewer officers (50%) stating this was the case with company planning.

As shown in the bottom half of Table 4, factors essential to a plan were typically considered during both platoon and company planning. As expected, determining a task organization and assigning missions to subordinate elements was accomplished most frequently, since this action is required in order for subordinate units to know their role in the tactical mission. It is noted that each of these factors is either supported by OneSAF or must be considered when developing a OneSAF scenario. The impact of changing these factors (e.g., varying the initial array of forces, scheme of maneuver, etc.) can be determined by developing different OneSAF scenarios. Consequently, in this regard OneSAF reflects central and common operational requirements.

Table 4
Substeps Used and Factors Emphasized in Making a Tentative Plan During Platoon and Company Planning

Making a Tentative Plan	**# of Officers Platoon (n = 15) / Company (n = 12)**		
Substeps Addressed	Always	Usually	Seldom or Never[b]
Detailed mission analysis was conducted using the factors of METT-TC	3 / 3	8 / 8	4 / 1
Enemy situation and terrain were analyzed and COAs were developed.	5 / 4	7 / 6	3 / 2
Each feasible COA was analyzed.	0 / 1	4 / 5	11 / 6
COAs were compared.	1 / 1	3 / 5	11 / 6
Tentative COA was selected.	4 / 6	8 / 3	3 / 3
Factors Considered in Planning			
Analyzed relative combat power based on known / possible enemy/ terrain / forces & fires available.	4 / 3	6 / 7	5 / 2
Generated options for fires, positioning, & maneuver.	8 / 6	3 / 3	4 / 3
Determined initial array of forces for each option.	5 / 4	6 / 5	4 / 3
Developed scheme of maneuver for each option.	4 / 3	6 / 4	5 / 5
Determined task organization & assigned missions &/or tasks to subordinate elements[a]	10 / 5	3 / 3	2 / 3

[a] Missing data from one of the 12 officers who had been company commanders.
[b] Results for the two categories of "seldom" and "never used" were combined.

All planning experience. The majority of the officers (73%, 11 of 15) indicated they "wargamed"[4] or "thought through" how the battle would unfold during mission planning (page B-8, Question 10, Appendix B). In this process, the majority (at least 50%) "always" considered the critical tasks and the desired end state (Table 5). The impact of the terrain, flow of the battle,

[4] "Wargaming is a step-by-step process of action, reaction, and counteraction for visualizing the execution of each friendly course of action (COA) in relation to enemy COAs and reactions. It explores the possible branches and sequels to the primary plan resulting in a final plan and decision points for critical actions." (HQDA, 2004, p.1-197)

relative position of units during phases of the mission were "always considered by 40% to 47%. Only 28% of the officers "always" considered the two factors that directly addressed the enemy (items "c" and "e" in Table 5). It is noted that OneSAF requires leaders to formally consider the enemy or adversary during mission planning. To develop a OneSAF scenario, enemy actions, equipment, strength, and organization must be specified.

Table 5
Factors Considered During Wargaming

Course of Action Factors	**# of Officers**		
	Always	Usually	Seldom
Critical tasks to accomplish.	9	2	0
Desired end state.	8	3	0
Characteristics of the terrain in area of interest and effects of the terrain on my maneuver and fires.	7	3	1
The flow of the battle &/or execution of the mission.	6	5	0
The relative position, composition, &/or disposition of subordinate elements at phases of the battle.	6	3	1
Enemy dispositions; probable courses of action or reactions.	4	6	1
Possible actions or reactions to counter enemy actions.	4	5	2

Note. The frequency scale had a "never" option, but this was never checked.

The survey included questions on both defensive and offensive planning. Of the 18 defensive factors offered for consideration when developing or comparing COAs, at least 75% of the officers provided the highest rating of "very valuable" to only two factors (see Table 6). Seven other factors were rated "valuable" or higher by at least 75% of the officers. For these highly rated planning factors, those that are supported by OneSAF have a single asterisk and those required by OneSAF are marked with double asterisks in Table 6.

At least 33% of the officers rated nine factors as being of "limited" or "no value" or "usually not considered." Three defensive factors (related to the placement or employment of unattended ground sensors [UGSs], unmanned aerial vehicles [UAVs], special sensors/optic) received low ratings. Upon further investigation it was revealed that UGSs and UAVs were not available when the officers conducted unit planning as platoon and company leaders. No elaboration was provided for the low ratings on sensors/optic.

Table 6
Ratings of Defensive Planning Factors

	Ratings		
	"Very Valuable" (by ≥ 75%)	**"Very Valuable" or "Valuable" (by ≥ 75%)**	**"Limited" or "No value" or "Not Usually Considered" (by ≥ 33%)**
Defensive factor	*Placement of organic crew served weapons	*Placement of attached *weapons	Placement of forces for early warning and security
	*Enemy avenues of approach	Time available to prepare defenses and positions	Alternate and supplemental positions
		*Natural obstacles	Routes within the defensive position
		*Placement of engineer obstacles	Experience of subordinate units/leaders
		*Friendly long-range observation/fires	Attachments and/or detachments
		**Assignment of tasks to subordinate elements	Organization of subordinate elements
		**Required control measures	Placement of UGS
			Employment of UAV
			Employment of IR, thermal and image intensification systems

Note. ** indicates required by OneSAF. * indicates supported by OneSAF.

Of the 14 offensive factors offered for consideration when developing or comparing COAs, the highest rating of "very valuable" was provided by only 67% of the officers, and this was applied to only two factors *(*"avenues of approach and routes to the objective" and "required control measures"). Seven other factors were rated "valuable" or higher by at least 75% of the officers. Table 7 shows the sorting for the offensive factors. As with the defensive factors, for these highly rated planning factors, those that are supported by OneSAF have a single asterisk and those required by OneSAF are marked with double asterisks.

Table 7
Ratings of Offensive Planning Factors

	Ratings		
	"Very Valuable" (by ≥ 67%)	**"Very Valuable" or "Valuable" (by ≥ 75%)**	**"Limited" or "No value" or "Not Usually Considered" (by ≥ 33%)**
Offensive factor	**Avenues of approach & routes to the objective	*Known/probable enemy positions	Time available to prepare
	**Required control measures	**Your formations	Locations providing long-range fire &/or observations along or near AA & routes
		*Placement/location of attachments and/or supporting elements	Employment of forces for early warning and security
		*Anticipated obstacles (natural and enemy)	Employment of UAV
		**Task organization of your forces	Employment of IR, thermal and I2 systems
		**Tasks and missions to be assigned to your subordinate elements	
		Experience of subordinate units/leaders	

Note. ** indicates required by OneSAF. * indicates supported by OneSAF.

At least 33% of the officers rated five offensive factors as being of "limited" or "no value" or "usually not considered." As with the defensive factors, the "employment of UAVs and special sensors/optics" received low overall ratings.

As indicated by the asterisks in Tables 6 and 7, OneSAF capabilities can assist leaders in applying critical factors during the planning process, and can be used to create COAs and different battlefield conditions against which to evaluate the COAs. For example, the capabilities within OneSAF allow the leader to assign different avenues and routes for movement as well as to employ a variety of control measures. Users can generate enemy forces and obstacles with differing positions and impacts on the friendly force. Even many of the factors that leaders did not always consider such as UAVs are supported by OneSAF.

Profile summary of simulation and planning experience. The officers' experience with simulations was limited. They indicated that in an operational environment they had more planning time as a company commander than as a platoon leader, and this impacted the frequency with which various planning factors were addressed. Officers indicated the specific TLP substeps related to "formal" COA analyses and comparisons were typically not executed or viewed as critical. The authors noted that the factors the officers considered valuable in offensive and defensive planning are either supported or required by OneSAF.

OneSAF Assistance with Tactical Planning and OneSAF Complexity

Following about two hours of hands-on experience with OneSAF, the officers answered questions relating to the overall capabilities of OneSAF to enhance, support, or assist with planning at the company level and below. Specific OneSAF tools and features were rated as well. Officers also assessed whether OneSAF was easy to use and compared OneSAF to other simulations. Results from these questions and the comments on ease of use and OneSAF design are included in this section because they relate to the officers' perceived potential of OneSAF. Given the limited sample size, descriptive statistics are used to present the results.

Helpfulness of OneSAF in Accomplishing TLP

Officers were asked how helpful OneSAF could be if time and the situation permitted them to accomplish the steps in the TLP. Specifically, they rated how much OneSAF could enhance or assist in the planning steps. Table 8 below depicts the responses.

Table 8
OneSAF Relationship to TLP Steps

TLP Steps/Sub-Steps	**Rating: # of Officers** [a]	
	Very Helpful / Helpful	Possibly Helpful / Not Helpful
1. Receive the mission.		
a. Begin mission analysis using METT-TC.	8	7
b. Schedule work in the time available.		
2. Issue a warning order.		
3. Make a tentative plan.		
a. Conduct detailed mission analysis.	9	5
b. Conduct situation analysis & develop COAs.	10	4
c. Analyze each COA.	14	1
d. Compare the COAs.	11	4
e. Make decision on best COA from current estimate.	10	5
4. Start necessary movement.		
5. Conduct a reconnaissance (map only).	9	6
6. Complete the plan.		
7. Issue the order to subordinates.	6	9
8. Supervise preparations for the mission.		
a. Conduct rehearsals.	12	3
b. Conduct inspections/re-inspections		

Note. Steps/sub-steps 1b, 2, 4, 6, and 8b were blacked out as the training received and/or OOS v1 did not/could not address these areas. Not all officers responded to each item.

[a] Results from the four-point rating scale were collapsed into the two groupings shown.

As indicated in Table 8, at least 70% of the officers responded that OneSAF could be "very helpful" or "helpful" in enhancing COA analysis and comparison, as well as in conducting rehearsals. But they also commented that OneSAF would be more useful if there were

preformatted scenarios built into the system that could be modified quickly. Another recommendation was to have satellite imagery available in order to conduct a more detailed reconnaissance. The step receiving the lowest rating was "Issue the order to your subordinates." The reason for the low rating focused on the issue that there were no "take away" products (e.g., an order, operations overlay) generated via the MCT that could be given to subordinates [5]

OneSAF Support of TLP Steps and Sub-Steps

The officers observed various OneSAF features and tools during the demonstration, and then used them during the hands-on scenario creation and modification. They rated the relative helpfulness of these features and tools in support of both company and platoon TLP and planning. The combined "very helpful" and "helpful" ratings in Table 9 indicate that the OneSAF features were perceived to be more helpful at the company level than the platoon level. For company planning, 10 of the 15 features were perceived to be helpful by 80% or more of the officers, while at the platoon level only 2 features were perceived to be helpful by 80% or more of the officers.

Table 9
OneSAF Features and Tools Perceived to Help Company and Platoon Planning (high ratings of "very helpful" and "helpful")

N (%) Officers with High Ratings	Company Planning	Platoon Planning
14 (93%)	• Line-of-sight tool • *Run simulated mission and/or COA. • *Create the desired task organization.	
13 (87%)	• Compress the run times for missions and COAs. • Execute multiple runs of a mission and/or COA. • *Assign missions to entities/units • Halt runs and/or entities/units at desired locations or times	• Zoom/pan the map
12 (80%)	• Zoom/pan the map • Analyze and/or compare results of multiple COAs. • *Place control measures on map	• Line of sight tool
11 (73%)	• High resolution digital terrain database of the Area of Operations	• Compress the run times for missions and COAs • *Run simulated mission &/or COA • High resolution digital terrain database of the Area of Operations • *Place control measures on map

[5] The MSDE capability does allow the user to save a basic graphic of an operations overlay and a Word version of an order. However, the MSDE capability was not covered in the training.

N (%) Officers with High Ratings	Company Planning	Platoon Planning
10 (67%)	• *Place entities/units in desired formations and locations. • Modify orders for entities/units. • Select entities/units with realistic capabilities.	• *Create the desired task organization. • *Assign missions to entities/units • *Place entities/units in desired formations and locations.
9 (60%)	• Determine status of entities/units.	• Halt runs and/or entities/units at desired locations or times. • Select entities/units with realistic capabilities.
8 (53%)		• Analyze and/or compare results of multiple COAs • Determine status of entities/units.
7 (47%)		• Execute multiple runs of a mission and/or COA. • Modify orders for entities/units.

Note. * Required by OneSAF.

In discussing defensive and operational planning, we mentioned that some planning factors are required in OneSAF and some are not. A similar situation exists with the OneSAF features listed in Table 9. Some of the features in Table 9 are required to be executed in some form when developing a scenario (see features marked with an asterisk), while others are optional. Consider the three features rated as helpful at the company level. First, use of the line-of-sight tool is optional on the part of the user, although the results indicate that the officers thought this was very valuable. Second, the user must also run the scenario at least once. However, multiple runs are optional. Time constraints and reliability problems with the simulation during the research precluded some individuals from running a simulation multiple times. Third, the user must create the desired task organization; this does not occur automatically. However, the extent to which it is tailored (add elements to the maneuver units such as engineers or attack helicopters) can vary with the user's plan. Similar comments apply to the task organization of other forces (insurgents, civilians, etc.) that are employed.

In addition to the survey responses, the officers commented that the area-of-sight tool, distance tool, and the three-dimensional ultra high resolution buildings were extremely useful in depicting an enemy's point of view. They emphasized that for operational planning these tools would only be effective for operational planning if the three-dimensional terrain database in OneSAF was up-to-date and depicted the most current terrain situation (e.g., destroyed buildings, cleared areas).

Two features, "Modify orders for entities/units" and "Determine status of entities/units," were rated low at both company and platoon levels. The "modify orders" item was intended to elicit ratings on the usefulness of modifying the synchronization matrix to accommodate changes in plans vs. a change to a formal operations order. If interpreted in that sense, this coincides with comments by the officers during the sessions to the effect that not all changes to the synchronization matrix were easily executed. With respect to "determining status of

entities/units," there were no products automatically generated by the MCT in OOS v 1.0 that could be provided as a "take-away" roll-up of unit status for subordinate leaders. Feedback on status during the training focused on checking the status of each entity (person or vehicle) which is provided via pop-up displays in OneSAF. As cited previously, although there was an AAR capability through the MSDE, this capability was not demonstrated in the research. The focus instead was on demonstrating how running a scenario in OneSAF could be an effective tool in showing subordinates how a leader anticipates friendly forces being arrayed, the timing for and sequence of events, and the potential contingencies that might be expected.

OneSAF Support of the Company Planning Process

The officers indicated the extent to which the OneSAF capabilities they observed and experienced could assist and support the planning process in a maneuver company or company team. These ratings are in Table 10.

Table 10
OneSAF Relationship to Company Planning Processes

OneSAF Capability	**# Responses for Each Rating**		
	Very Helpful	Helpful	Possibly Helpful / Not Helpful
Most Useful (At least 73% rated as very helpful or helpful)			
Assists with COA development.	5	8	2
Allows runs of multiple COAs for comparisons.	4	10	1
Assists with the analysis of a COA.	3	11	1
Assists with arriving at initial decision/COA selection to focus mission preparation efforts.	3	8	4
Useful (53% to 60% rated as very helpful or helpful)			
Assists with aspects of mission rehearsal.	4	5	6
Assists with the order: provides a visual depiction of anticipated actions during an operation.	4	3	8
Assists with initial mission analysis.	2	7	6
Assists with the review of terrain and/or operational details to complete the plan.	2	5	8
Assists with refining the focus of leader recon.	0	8	7
Assists with detailed mission analysis and estimate of the situation.	1	7	7
Mean # Responses	2.80	7.20	5.00

The capabilities relating to COA development, analysis, and comparison received higher ratings than the other six capabilities, e.g., mission rehearsal, focus of leader reconnaissance. The officers commented that OneSAF would be a good tool to use in an institutional environment to increase students' abilities to develop, analyze and compare COAs. However, they also commented that the time required to build a COA is a detriment to using OneSAF in an operational environment when time constraints exist. One individual indicated that for some

missions in OIF he would have had time to use OneSAF to develop a COA, but could not have used it when planning time was very limited. The officers suggested that having a library of pre-built scenarios that could be quickly modified would improve the process for both operational and training applications.

Ease, Usefulness, and Complexity of OneSAF

Officers rated the ease of use and usefulness of ten major OneSAF functions covered in the training. The list of functions for each question mirrored the steps the officers followed during their hands-on segments of the research session. It is important to note that all functions were performed using the MCT interface.

Ease of use. As seen in Table 11, the most common response across all ten functions was "simple/not difficult," with over half the officers (53% to 80%) making this response. The maximum number of officers indicating a function was "very simple" was 4 (27%). None of the officers rated any function as "impossible to use", and only one rated one function as "very difficult."

Table 11
Ease of Using the Ten OneSAF Functions Incorporated in the Training

OneSAF Function	# Responses for Each Rating		
	Very simple	Simple/ Not Difficult	Difficult/Very Difficult
Easiest (At least 80% rated as very simple or simple/not difficult)			
Locate, select, and load the terrain database.	4	11	0
Select and place forces on the map.	2	12	1
Arrange forces in desired tactical formation.	3	10	2
Run a COA once.	4	8	3
Configure force to match a desired task organization.	1	12	2
Run a COA multiple times.	2	10	3
More difficult (60% rated as very simple or simple/not difficult)			
Place control measures on the map.	2	8	5
Determine the outcome of a run/scenario.	2	8	5
Most difficult (No "very simple" rating)			
Assign missions to the elements/units	0	10	5
Modify a scenario to permit runs of multiple COAs.[a]	0	8	6
Mean # Responses	2.00	9.70	3.20

Note. The "impossible to use" category is not included, as no ratings occurred in this category. "Difficult" and "very difficult" categories were combined as there was only one response to "very difficult."

[a] One non-response.

The last two functions listed in Table 11 received no "very simple" ratings, and at least 33% of the respondents indicated these functions were difficult. The functions were "Assign missions to the elements/unit," and "Modify a scenario to permit runs of multiple COAs."

Perhaps the reason for these ratings is that using the MCT to accomplish these functions required multiple steps; and when all entries were not accurate and completed, the scenario would not run properly.

Usefulness of functions. Officers were also asked to rate the usefulness of the same ten functions. The preponderance of officers (at least 67%) rated the functions as "very useful" or "useful" (Table 12). Comments during the training sessions indicated they saw OneSAF as a useful tool to build phases of their plan and to confirm timing and coordination. They were slightly concerned about the stochastic ability of the system to give them a different result for the scenario with each run even when no changes were made. Even though the scenario could be run multiple times and the user could consider the varied results from the runs, they were concerned that in an operational environment time might not permit multiple runs and they could make a decision based on a single run that might not be representative of the outcome from several runs. The same point about running a scenario multiple times was not identified as a concern for training applications.

Table 12
Usefulness of the Ten OneSAF Functions Incorporated in the Training

OneSAF Function	**# of Responses for Each Rating**			
	Very useful	Useful	Possibly useful	Not useful/ detract
Run a COA once.	6	7	1	1
Place control measures on the map.	5	8	1	1
Select and place forces on the map.	4	8	2	1
Configure the force to match a desired task organization.	2	11	1	1
Locate, select, and load the terrain database	2	9	4	0
Modify a scenario to permit runs of multiple COAs.	4	5	6	0
Run a COA multiple times.	2	9	3	1
Assign missions to the elements and units.	4	6	4	1
Arrange forces in desired tactical formation.	2	8	4	1
Determine the outcome of a run/scenario.	2	8	4	1
Mean # Responses	3.30	7.90	3.0	0.80

Note. The "not useful" and "detract from planning" categories were combined due to the limited number of officers marking these two categories. The functions are ordered by their mean ratings, with the most useful cited first.

Comments on OneSAF features, tools, and functions. The officers' comments during the sessions regarding the OneSAF interface supplement and help explain the results on perceived difficulty and use. The majority were familiar with Microsoft PowerPoint graphics, and the ability to modify them by clicking and dragging, or dragging and dropping. The more senior officers who had been exposed to the Command Post of the Future (CPOF) software commented that the CPOF graphical user interface incorporated the same Microsoft capabilities and was easy to use. The same techniques could not be used in the MCT module of OOS v1.0. The inability

to drag and drop and modify graphics frustrated the officers when placing control measures on the map and attempting to modify them as they explored possibilities for their plan. In addition, they did not find the function of adding or deleting a point from a route control measure using the control measures palette very easy or user friendly. It should be noted that OneSAF v1.5 makes this process easier, and the user can modify control measures by working directly with the map interface instead of using the control measures palette. Route names in OneSAF v1.0 could not be moved; they often appeared on top of each other and became illegible. These interface issues probably contributed to the lower ratings for the functions of assigning missions and modifying scenarios. The officers were satisfied, however, with the control measure create palettes' ability to depict the steps for placing the control measure on the map.

Additionally, the officers felt that the two-dimensional map that depicts the three-dimensional terrain database used in the training did not have enough detail, or a satellite imagery capability, to be useful at the Infantry platoon and company levels while planning for a mission. For operational purposes, officers stated that they would rather use a normal military 1/50,000 scale map, or a satellite image (Google Earth was mentioned regularly) to conduct a map reconnaissance. They offered that use of Google Earth is now the normal process used in OIF/OEF. Although they acknowledged that the ability of the OneSAF terrain database affected unit's movement, visibility, capabilities, etc., the computer-generated map did not appeal to them. For example, variations in vegetation, types of roads, and other standard features on normal military maps were not portrayed on the computer-generated map. These differences were important to the officers, as detailed information regarding terrain is critical to Infantry mission planning. There is a need for high resolution terrain. Moreover, the success of many operations depends on having the right friendly force at the right place and time to counter the enemy force. Since battlefield conditions can change quickly (e.g., a building turned to rubble from explosion or artillery attack, a bridge disabled to preclude vehicular movement), the terrain database used for operational planning needs to represent these up-to-the-minute changes. These considerations are less important for training applications of OneSAF.

The task organization window in OneSAF and associated steps for selecting and modifying a unit were received favorably. Officers liked the ability to modify a unit's task organization to match an actual unit's strength.

However, they did become confused with the unit naming conventions below the platoon level. The most confusing part was the distinction between the mounted and dismounted elements of a Stryker or Bradley Fighting Vehicle (BFV) platoon. The OneSAF (v1.0 and v1.5) naming convention adds a single unique identifier to differentiate between the vehicle sections and the dismounted infantry. The OneSAF task organization and mission editor windows use a "1" to identify the mounted element and a "2" to identify the dismounted element. However, unit naming conventions as given in Field Manual 5-0 (HQDA, 2005) use an "A" or "B" to identify each vehicle section without an additional number; dismounted Infantry squads are identified by their number. These differences caused confusion among the officers who were accustomed to seeing the doctrinally correct naming conventions. Table 13 illustrates the differences between the two naming conventions. The differences in naming conventions for dismounted elements and vehicular sections are shown; they are highlighted and bolded.

Table 13
Comparison of Unit Naming Conventions

Source of Naming Convention	**Task Organization**						
	Team	Squad	Section	OneSAF unique identifier	Platoon	Company	Battalion
Dismounted Infantry Designations							
OneSAF	A	1		2	1	A	2-7 INF
	A/1/2/1/A/2-7 INF						
FM 5-0	A	1		1	1	A	2-7 INF
	A/1/1/A/2-7 INF						
Vehicle Section Designations							
OneSAF			1	1	1	A	2-7 INF
	1/1/1/A/2-7 INF						
FM 5-0			A		1	A	2-7 INF
	A/1/A/2-7 INF						

The officers were generally satisfied with many features and capabilities of OneSAF and did indicate that OneSAF would be helpful at the company and platoon level for COA development. The features and capabilities highlighted as being useful included: the ability to zoom in or out to the predetermined scales of 1/50 to 1/2,000,000; the area-of-sight tool, the line-of-sight tool, the distance tool, the navigation tool (the ability to center the map on a desired location, unit or entity), and the layer tool. The layer tool allowed them to vary the interval between contour lines, to expose the interiors of the ultra-high resolution buildings when desired, to turn off control measures and grid lines if desired, etc. One officer gave an example of how these tools could have aided him on an actual mission during OIF. He had to emplace snipers on a roof top over-watching the objective and was not able to emplace them until just prior to mission execution. When the snipers were able to access the building and get in place they realized that they had no line of sight on the target house and had to move to a different location, ultimately delaying the mission execution. He stated that if the databases are current, this would have been a perfect situation to employ the OneSAF tools during mission planning.

Comparision to other simulations. Based on their prior experience with other simulations, the officers rated both the complexity and potential value of OneSAF as a planning tool, as compared to other aids and simulations. Only the 13 officers who had used other simulations answered these questions. Of these 13, the majority (77%) rated OneSAF as "similar in complexity" or "less complex" as a planning tool compared to other aids and simulations. About half (54%) the 13 rated OneSAF as "similar in value" to other aids and systems with the remaining officers rating OneSAF as "more" or "much more" valuable as a planning tool than other aids and systems (31% and 15% respectively). No one rated OneSAF as less valuable than other simulations.

Perceptions of OneSAF Training Requirements

The officers also assessed how long they expected to retain their ability to use the OneSAF features and tools they used during the experimental session, and provided input on desired training techniques and support materials.

Retention of OneSAF Functions

Given that OneSAF contains numerous features and tools, much information was conveyed in a relatively short period during the research sessions. Consequently, it was of interest was to obtain estimates of how long the officers might retain OneSAF functions, based on their research session. The officers estimated how long they would retain ten OneSAF functions; the same functions they rated for ease of use and usefulness (see Table 14). As a point of reference, the mean time spent teaching the various functions is provided in the table.

Table 14
Estimated Ability to Retain the Ten OneSAF Functions Incorporated in the Training

OOS Functions (mean training time in minutes)	**# Responses for Each Rating**				
	Retain for several months	Retain for about a month	Need some refresher after a couple weeks	Need some refresher after a few days	Already forgotten; need refresher now
Run a COA once	5	8	2	0	0
Locate, select, & load terrain database (5 min)	3	6	3	2	1
[a] Select and place forces on the map	3	5	5	2	0
[a] Arrange forces in desired tactical formation	2	7	4	2	0
Configure the force to match a desired task organization (21 min)	2	5	5	3	0
Place control measures on the map (15 min)	4	4	4	3	0
Assign missions to elements & units (20 min)	2	6	5	2	0
[b] Determine the outcome of a run/scenario [c]	4	3	5	0	2
[b] Run a COA multiple times	4	6	4	1	0
[b] Modify a scenario to permit runs of multiple COAs [c]	3	5	3	3	0
Mean # Responses	3.20	5.50	4.00	1.80	0.30

[a] These two functions/capabilities were combined during training and took an average of 21 minutes to complete.
[b] These three functions/capabilities were combined during training and took an average of 127 minutes to complete.
[c] One non-response.

The most common responses were "will remember for about a month" and "need refresher training after a couple of weeks." Few officers indicated they had already forgotten a function. However, the results also indicate relatively low agreement on how long officers felt the functions would be retained. The highest agreement was for "run a COA once" where 53% of the officers felt they would retain this function for about a month. As shown in Table 14 several functions had more than one mode. Functions such as "placing control measures on the map" and "modifying a scenario" had relatively flat distributions across the response options.

The officers were probably optimistic about their ability to recall given the short training session. The only function where no one indicated they would need refresher training "after a few days" or "that they had already forgotten the function" was "run a COA once." This is not surprising since this is a one-step function with the icon "▶" indicating "run"; the same icon used with various media equipment. Otherwise, no function stood out as likely to be remembered for a substantial period of time (only about 20% indicated they would retain the functions for several months). Results indicate that more hands-on experience is needed, where individuals can generate their own scenarios several times. This was more than the single iteration available in the training session.

Training Support Materials and Techniques

Officers were asked how future training could be enhanced or changed when presenting OneSAF to other small groups of officers. They were allowed to mark more than one training technique and/or training support material for each OneSAF function that was covered in the session. Four factors were identified: more instruction and demonstrations, more practice exercises, provide a job aid/handout, and develop a detailed User's Guide.

Regardless of the function, more practice exercises were recommended by 56%. A detailed user guide was recommended by 35%; a job aid/handout by 28% and more instruction and demonstrations by 20%. In summary, the officers felt that more practice exercises were needed along with the appropriate training support materials.

Institutional Training Applications of OneSAF

The officers saw potential for use of OneSAF in leader training environments. Most (73%) responded favorably that OneSAF would be a useful instructional and training tool for institutional training courses. About half of them (53%) believed OneSAF could be used in the MCCC, while fewer (40%) thought OneSAF would be useful for lieutenants in the Infantry Officer Basic Course/Basic Officer Leaders Course II and III, and only 20% suggested using OneSAF in the Command and General Staff College. They offered that the simulation could be used in parallel with the Military Decision Making Process training for COA development and wargaming in the courses, but instructors would require more training on OneSAF and on how to use it effectively in training.

One individual offered that in the institutional setting the students could be placed into groups of three to build and execute a COA they developed during orders production. They commented that using OneSAF would work especially well in the MCCC to help shift student

emphasis away from producing products (e.g. orders) and more towards tactical planning and war-gaming. However, there would need to be some dedicated staff available to assist with OneSAF.

Discussion

The discussion section focuses on the major comments, suggestions, and ideas for a simulation offered by the officers. Some, but not all, were integrated as appropriate in the Results section. It is noted that some features may be desirable for training leaders in mission planning, whereas the same features may be less desirable in operational situations. Lastly, future releases of OneSAF address some of the points that were raised.

Two selection criteria for officers in this research were recent combat experience while assigned at the platoon and company level, and completion of the officer education systems' basic and advanced courses for the platoon leader and company commander. Officers with this prior experience are able to respond to the question of simulation applicability in the operational environment. Also, it was more likely that their exposure to other simulation systems (e.g., JCATS and Janus), which are used in a variety of roles (e.g., planning, execution, and decision making), could be a basis for assessing the potential for OneSAF during tactical operations and as a tool in institutional training courses. As indicated previously, two-thirds of the officers had combat experience in OIF/OEF between 2001 and 2007.

It is also noted that relatively few of the officers indicated that, as leaders, they had deliberately conducted different COAs and compared them in operational planning environments. One limitation of the research was that the short time available did not enable the officers to execute multiple COAs with OneSAF and see the impact of different plans.

Use of OneSAF for Tactical Operations and Institutional Training

The officers' comments did not center on the inherent capabilities of OneSAF to appropriately depict combat operations, force capabilities, and enemy/friendly behaviors and reactions, nor whether the simulation appropriately depicted combat outcomes. Of interest is that there were no negative comments. In fact, there appeared to be little concern regarding these factors. Instead, the concern was with the usability of OneSAF in tactical planning at the small-unit level. The comments about applying OneSAF in an operational environment focused on the degree to which the interface and the functions could be made more user-friendly in order to facilitate application in tactical situations. Although these comments are put in the context of tactical operations, many also apply to institutional training of small-unit leaders on course of action analyses.

The officers unanimously agreed that OOS v1.0, in its current form and with their limited knowledge of the system, would not be applicable to company and platoon level tactical planning in an operational environment. The most common themes supporting this conclusion were that it is time consuming to input data for a scenario and OOS v1.0 (via the MCT capability) did not produce a "take away" package with the order, operational overlay, or mission planning information that can be provided to subordinate leaders. The time-consuming aspects

of OneSAF and the lack of a "take-away" package also impact training and training efficiency. [It is noted that screen captures can be made of the overlays and execution matrix on the MCT display, and exported to an external image printing software program for dissemination as desired.]

Although the attention to detail required by OneSAF was cited as a drawback when planning in a time-constrained operational environment, when training small-unit leaders on the complexities of planning such detailed requirements can be beneficial. In this way they can appreciate all factors that must be considered and the resulting impact on the mission when critical factors are overlooked.

OneSAF Design Considerations

The officers commented on positive features of OneSAF as well as on ways to improve the design of OneSAF that would facilitate its use in operational and training environments. The primary areas mentioned are summarized in this section.

The line-of-sight tool and area-of sight tool were perceived as being very useful. For example, at the platoon level, a leader could use these tools to determine where to locate snipers. However, these tools would be enhanced if they functioned with satellite imagery of the target area. For operational applications, any terrain database would need to accurately reflect items that could hinder observation, such as seasonal vegetation.

It is good to be able to input potential enemy locations and realistic actions then modify them to assess the different possible outcomes. Having the CGF to generate battlefield actions for consideration in COA analysis is better than having a person try to think like the enemy.

Creating a scenario using the MCT required numerous steps and inputs. For operational applications, the officers felt the system should be simple enough that a user could create and run a COA in less than an hour. They often commented that having a library of scenarios to use as a starting point could save time. The challenge with this approach for operational applications is that so many units and potential users have different task organizations, have different equipment assigned, and will operate in drastically different terrain, each dictating different control measures. For institutional training, however, a library of scenarios could save training time and help the instructor focus on critical planning factors.

The officers stated that the simulation became time-consuming when assigning missions (behaviors) to the units or entities for tactical applications. Multiple comments focused on the fact that when planning in OneSAF you have to plan and assign implied tasks that are normally covered in the unit's SOP and do not require leader planning specifically for these contingencies (i.e., mount/dismount vehicles, hitch/unhitch towed equipment, specify moving into the appropriate unit formation, vehicle speed under specified conditions, unit order of movement, etc.). However, in OneSAF, if you do not correctly plan or inadvertently miss an implied task, it could cause the scenario not to run. It was suggested that some means be implemented so the implied and more detailed inputs could be eliminated or reduced. On the other hand, for training

applications, it may be desirable to present situations that require leaders to be cognizant of all the relevant tasks that must be completed.

Additionally, the officers commented that because of the numerous steps and details required to run a scenario it is quicker to draw a concept sketch of the operation and plan using the sketch. The consensus recommendation was to have pre-built scenarios that require minor modifications to run in OneSAF. An easier means to input information into OneSAF such as touch screen capabilities for placement of units and control measures would also speed the scenario development process.

The naming convention for units and entities in the current system should be consistent with doctrine. A change in this feature would make OneSAF's task organization and mission editor modules more intuitive, allowing for direct transfer of concepts that leaders already know. In addition, the interface would be more user-friendly and enable users to accurately and quickly identify the entities and units on the display.

Some commonly used graphic control measures could be modified to simplify scenario development. For example, during operational planning, the user will typically establish a route of movement. At a later point, phase lines might be added to coordinate the timing of unit movements. In the version of OneSAF used in the research, the phase lines could intersect the movement route and be used to trigger a separate event. However, in order to stop a unit at the intersecting phase line, the user was required to plot a route up to the phase line and then plot another route that began at the phase line and continued onward, thereby creating additional steps in developing the scenario. Another suggestion was that adding the ability to simply drag-and-drop or click and drag information, behaviors, etc., between various screens would be more consistent with Windows operating systems and could save user input time.

With OneSAF, it is possible to pause a scenario during its execution. This capability could be leveraged for training and mission rehearsal purposes, by taking a series of screen captures of displays in the MCT, and saving them to an external software program for quick presentation during an AAR following COA execution. This would save time in trying to fast "replay" the entire COA to reach the desired point in the actions. Although the AAR tool does allow snapshots taken at pre-determined intervals, often AAR leaders want to focus on specific, critical events and actions which can only be identified as they occur and cannot be pre-determined. It is noted again that this AAR option was not presented in the training sessions.

Because the U.S. Army conducts many missions at night, the officers indicated a need for this capability. Future releases of OneSAF will incorporate night capabilities as well as variations in the weather.

The need for information that supports hard copy output of orders and overlays, synchronization matrix, and summary status reports and AAR data was mentioned. Although some of these tools are available in OneSAF via the MSDE and the special AAR subroutine, they were not available in the MCT used in the training sessions nor were they covered via special demonstrations. Consequently, it is not known whether they would have met the needs

of the officers. Future training sessions should cover these capabilities as well as some options for obtaining relevant AAR data from the MCT itself.

Operational Considerations

The tactical missions available in the version of OneSAF (v1.0) used in the research represent the typical missions and collective tasks from doctrinal manuals. However, they did not include the missions frequently conducted in OIF/OEF, such as company cordon and search. In order to depict these contemporary missions, the user typically had to modify entities and attributes. For example, an entity can be a suicide bomber, and IEDs (improvised explosive devices) can be created. Specification of all the appropriate attributes for these entities can become a time-consuming and complex process. Future releases of OneSAF will incorporate more behaviors typical of the contemporary operating environment.

Units typically have battle rosters and other electronic files that list unit personnel and describe the task organization. The officers felt it would be useful if these data could be fed electronically into the simulation so users would not need to build their organization from standard library files in the simulation.

It would be useful if the COA developed in the simulation could be easily saved and then directly loaded into operational command and control systems (e.g., FBCB2) so leaders would not need to recreate the operational graphics and control measures. Interfaces with FBCB2 are being developed in future releases of OneSAF but it is not known whether this particular capability is being considered.

The officers indicated that tactical planning usually emphasizes the use of the reverse planning sequence; that is, begin planning actions on the objective first, then backward plan all of the events that will lead to the final desired outcome (e.g., if the leader wants to attack at a certain time, what time must the unit depart the assembly area in order to move and be prepared to attack at the desired time). They felt it would be useful if the simulation phase easily accommodated this reverse planning process.

Future Training Research

Future training research with the OneSAF simulation should incorporate sufficient time to give participants the hands-on practice necessary to achieve the desired proficiency. The training location must have computers that meet or exceed the simulation requirements to insure uninterrupted system operation and the ability to use all desired capabilities simultaneously.

There are many issues that future training research could address. Suggested areas are listed here.

- The perceived usefulness of OneSAF's MSDE and AAR modules.
- Effectiveness of training aids with tips and guidance on the important factors that must be addressed when developing a scenario, such as generating common graphic control measures (e.g., routes, support-by-fire positions, ambush), specifying attributes of

frequently used behaviors (e.g., move tactically both ground and aerial, issue a fire command, mount/dismount, assault), and tailoring the task organization (e.g., different units, strength, supply status). These tips could expedite scenario development by resulting in less trial-and-error behavior on part of the planner.

- Impact of improving leader skill in developing tactical plans in courses such as the MCCC. For example, research could be conducted on the impact of comparing the results of different COAs, on the impact of instructors demonstrating the outcomes of inadequately developed plans that were created in previous courses, and on the impact of increasing the complexity of the simulation. Simulation complexity could be varied by the echelon depicted in the simulation (platoon, company, battalion), and by the number of sides (enemy vs. friendly only, inclusion of civilians, inclusion of various terrorists factions, etc.)
- The value of executing a scenario with only coalition or friendly forces in order to obtain an estimate of time-distance relationships. This training would probably be most beneficial in the early phases of training.
- The relative effectiveness of having students in the MCCC develop an entire scenario vs. modifying a base scenario vs. participating in the distributed OneSAF mode.

Summary

Several limitations of the research impacted the research results, and should be considered when reviewing the results. First, the initial release of OneSAF (v1.0) was used. Additional capabilities and features are being incorporated in later releases. Some of the new features address the issues raised in the research. Second, there was limited time for training and hands-on experience with OneSAF during the research. Consequently, not all OneSAF v1.0 features were shown, including some features that were viewed as desirable. Lastly, the stand-alone mode of OneSAF was used, not the distributed mode. Everyone had to execute all OneSAF functions for all forces. In the distributed mode, the scope of a user's responsibilities are less, and there are fewer skills to master, although skill with and knowledge of OneSAF are still required.

The number of officers in the research was relatively small. Even so, they provided a good representation of the potential target users of OneSAF. These are users who would conduct mission planning and rehearsal in operational environments, receive formal training on mission planning in institutional courses, and use OneSAF in mission rehearsal exercises at home station. With regard to training applications, the officers generally concurred that OneSAF could be a useful simulation to assist in training leaders at the platoon and company levels. The amount of data inputs needed to create a scenario, the detailed requirements to provide instructions for each entity and unit, and the attention to detail to ensure that all tasks are clearly scheduled force the leader to consider many factors and points in developing a COA. However, because of the amount of detailed input required, the officers responded that OneSAF in the form used for this research (version 1.0) would not be a suitable means of planning actual tactical operations when time was constrained. Updated terrain would also be necessary under operational circumstances.

They estimated that they would remember the features for a few days to a month after the training, but recommended more hands-on experience and demonstrations during future training

sessions, supported by job aids and user guides. The Quick Start Guide used during the research was a valuable reference. It enabled the officers to create a scenario from "start to finish" by documenting the essential steps of this scenario development process. However, it did not include descriptions of how to incorporate all relevant control measures and unit-associated tasks/behaviors that could be needed at the platoon and company levels.

A consistent point was that a simulation for platoon and company level planning had to provide sufficient depth and detail to allow users to make informed decisions. At the same time the simulation had to be user-friendly. This meant that the interface should be easy to understand and use as well as that the required inputs should be simple and kept to a minimum.

In general, the officers indicated that the capabilities of OneSAF were similar or greater in value to other simulations. A finding that should not be overlooked is that the factors the officers cited as valuable in planning defensive and offensive operations are either required by OneSAF or are supported by OneSAF. This relationship corroborates the potential value of OneSAF as a training tool.

Conclusions

Although the effort was a limited, initial excursion with OneSAF, insights into potential uses for and the value of OneSAF in institutional training and for mission planning at the company level and below were obtained. A newer version of OneSAF was released after this research was completed, and addresses some of the suggestions offered by the individuals who participated in the research. This initial effort targeted a limited set of the functions and capabilities available in the simulation, and even more features will be included in future releases. These factors must be considered when reviewing the results, limiting the extent to which some results should be generalized.

It seems clear that OneSAF could enhance the institutional courses for training platoon leaders and company commanders on various aspects of COA development, analysis, and comparison. The details required to create and run COAs in OneSAF forces a planner to conduct thorough planning, to consider numerous factors, and to address explicitly many actions and behaviors that might typically be considered implied tasks. Another positive feature is that OneSAF either requires or supports the defensive or offensive planning factors considered to be valuable by the officers. All these factors contribute to making OneSAF a good tool for helping to train new leaders in planning platoon and company level operations, both within leader courses and at home station (in garrison).

For operational applications, the officers had some reservations, primarily because they believed that the version of OneSAF used in the research required too much time to develop a useful, detailed scenario. As such, it would not be functional for Infantry companies and platoons operating in a time-constrained, and frequently austere tactical field environment. For both training and operational applications, it appears that the major challenge for future versions of OneSAF is how to maintain the depth, detail, complexity, and flexibility required in a simulation of this scope, and to simultaneously make it user-friendly and allow quick development of a scenario.

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Appendix A

Acronyms

ACR	Advanced Concepts and Requirements
ARI	U.S. Army Research Institute
AVCATT	Aviation Combined Arms Tactical Trainer
BBS	Brigade/Battalion Battle Simulation
BFV	Bradley Fighting Vehicle
CBS	Corps Battle Simulation
CCTT	Close Combat Tactical Trainer
CGF	Computer Generated Forces
COA	Course of Action
CPOF	Command Post of the Future
CPU	Central Processing Unit
DARWARS	various simulation components from the Defense Advanced Research Projects Agency
GB	Gigabyte
GHz	Gigahertz
HQDA	Headquarters, Department of the Army
JCATS	Joint Conflict and Tactical Simulation
MCCC	Maneuver Captains Career Course
MCT	Management and Control Tool
METT-TC	Mission Enemy Terrain Troops – Time and Civilians
MSDE	Military Scenario Development Environment
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
OneSAF	One Semi-Automated Force
OOS	OneSAF Objective System
OTB	OneSAF Test-bed Baseline
PEO-STRI	Program Executive Office for Simulations, Training, and Instrumentation
RAM	Random Access Memory
RDA	Research, Development, and Acquisition
SGI	Small Group Instructor
SOP	Standing Operating Procedure
SVS	Soldier Visualization System
TacOps	Tactical Operations (a commercial simulation)
TACSIM	Tactical Simulation
TEMO	Training, Exercises, and Military Operations
TLP	Troop Leading Procedure
TRADOC	U.S. Army Training and Doctrine Command
WEL	Warfighter Experimentation Laboratory

Appendix B

Data Collection Instrument for the Assessment of the OneSAF Objective System (OOS) for Mission Planning and Institutional Training

SECTION I. Biographical Data

1. Rank _____. Branch/Specialty _____.

2. Please indicate how long you have served in the following capacities:

   a. Time in service (Army) _____ years/months

   b. Commissioned service _____ years/months

   c. Current grade _____ years/months

   d. Time as a platoon leader _____ years/months

      Type unit: BFV ____; Stryker _____; Light Infantry _____; Other (Specify) _____

      Was your platoon equipped with FBCB2/BFT? yes/no (circle answer)

   e. Time as a company commander _____ years/months

      Type unit: BFV ____; Stryker _____; Light Infantry _____; Other (Specify) _____

      Was your company equipped with FBCB2/BFT? yes/no (circle answer)

3. Please indicate your combat experience:

a. Position held: _____, Months: ____ OIF ____; OEF _____; Other (Specify) _____

b. Position held: _____, Months: ____ OIF ____; OEF _____; Other (Specify) _____

c. Position held: _____, Months: ____ OIF ____; OEF _____; Other (Specify) _____

d. Position held: _____, Months: ____ OIF ____; OEF _____; Other (Specify) _____

e. Position held: _____, Months: ____ OIF ____; OEF _____; Other (Specify) _____

4. Characterize your experience with training and exercise simulation systems.
Use the following scale to indicate your past experience with each of the systems listed below.

0 = no experience
1 = exposed to the simulation (observed in use or a demonstration)
2 = used on a limited basis (one to three times in a year)
3 = used routinely (4 to 10 times in a year)
4 = used extensively (once a month or more for an extended [year or more] period)

a. ____ Brigade/Battalion Battle Simulation - (BBS)

b. ____ Corps Battle Simulation - (CBS)

c. ____ Janus - (non commercial combat simulation)

d. ____ TacOps – (a commercial war game simulation for multiple players)

e. ____ Tactical Simulation - (TACSIM)

f. ____ One Semi-Automatic Forces (One-SAF) Testbed Baseline - (OTB)

g. ____ Soldier Visualization Station - (SVS) Indicate location (Ft. Benning Battle Lab or other location: _____

h. ____ Joint Conflict and Tactical Simulation - (JCATS)

i. ____ DARWARS (Ambush, Battlefield Tactics Trainer, and/or Full Spectrum Command) – simulation components of the Defense Advanced Research Projects Agency's (DARPA) research project intended to accelerate the development and deployment of military training systems

j. ____ Tactical Language and Culture Training Simulation (Iraqi or Pashto)

k. ____ OneSAF Objective System – (OOS) (**Consider Only Previous Experience**)

SECTION II. Planning Experience

In this section, please characterize your experience in the conduct of tactical planning. Base your selections and answers on **your** "in unit" experiences, **not** Army doctrine. Some questions in this section are focused on your experience as a platoon leader and others on your experience as a company commander.

Background: During the execution of operations, the pace and tempo can be very rapid. Fragmentary orders (FRAGOs) can become the norm and there may be minimal time for troop leading procedures (TLP). Under these circumstances, planning and preparation time can be compressed, abbreviated, or nonexistent. The pace may become so rapid that unit standing operating procedures (SOPs) and/or battle drills replace formal orders and FRAGOs.

For this questionnaire, please focus on situations **when time was available** for mission planning and preparation (TLP). The US Army doctrine defines TLP and outlines specific processes and steps, but in reality, planning is conducted fairly informally. Please consider the steps and process that you went through, even if the steps were only done mentally.

1. Consider the time available and the circumstances when you conducted tactical planning as a platoon leader. For the question below, mark the **ONE** statement that was most typical of your experience.

_____ I was never provided time to plan/prepare for the next mission.

_____ My commander did the planning. My platoon prepared for the operation based on the company order.

_____ My commander provided a limited amount of time (less than ½ of the time available) to plan and prepare when the time was available.

_____ My commander provided half (1/2) of the time available for planning and preparation to subordinates.

_____ My commander attempted to provide two-thirds (2/3) of the time available for planning and preparation to subordinates.

_____ My commander attempted to provide more than two-thirds (2/3) of the time available for planning and preparation to subordinates.

2. Considering TLP as a guide in preparing for a tactical mission, use the table below to identify the importance of the steps and sub-steps of the process **based on your experience as a platoon leader, not doctrine**. Keep in mind that some steps may not follow a rigid sequence; for example, movement may start at any time. During some missions, steps may have been omitted, modified, or accomplished concurrently.

TLP Steps/Sub-Steps	**Rate the importance of each TLP Step/Sub-step when you planned as a Platoon Leader** (check the appropriate description)			
	Critical/ essential	**Needed**	**Helpful**	**Not helpful or not used**
1. Received the mission.				
a. Began an analysis of the mission using the factors of METT-TC.				
b. Scheduled your work in the time available.				
2. Issued a warning order.				
3. Made a tentative plan.				
a. Conducted a detailed mission analysis.				
b. Conducted a situation analysis and developed courses of action (COAs).				
c. Analyzed each COA.				
d. Compared the COAs.				
e. Made a decision on the best COA based on your current estimate.				
4. Started necessary movement.				
5. Conducted a reconnaissance.				
6. Completed the plan.				
7. Issued the order to your subordinates.				
8. Supervised preparations for the mission.				
a. Conducted rehearsals.				
b. Conducted inspections/re-inspections				

3. Consider sub-steps of TLP Step 3, Make a Tentative Plan. Due to time constraints, the situation, and/or conditions, sub-steps are often omitted. **Characterize your actions when conducting TLP <u>in your platoon</u>.** Indicate the frequency with which you executed <u>each</u> of the sub-steps, as a platoon leader.

Sub-steps to Step 3: Make a Tentative Plan	**Frequency**			
	Always	**Usually**	**Seldom**	**Never**
A detailed mission analysis was conducted using the factors of mission, enemy situation, terrain, troops available, time available, and civilian considerations (METT-TC).				
The enemy situation and terrain were analyzed and COAs were developed.				
Each feasible COA was analyzed.				
COAs were compared. Risk, future operations, and flexibility were considered.				
A tentative COA was selected. However, reconnaissance and refinement of the order continued.				

4. Continuing to consider TLP Step 3, Make a Tentative Plan, think about the process or steps you used to determine how you would accomplish the mission. **Focus only on the process used to develop your COAs <u>for your platoon</u>.** Indicate the frequency with which you executed <u>each</u> of the sub-steps to TLP Step 3, make a tentative plan, as a platoon leader.

Sub-steps to Step 3: Make a Tentative Plan	**Frequency**			
	Always	**Usually**	**Seldom**	**Never**
Analyzed relative combat power based on the known or possible enemy, the terrain, and the forces and fires available to me.				
Generated options for fires, positioning, and maneuver.				
Determined an initial array of forces for each option.				
Developed a scheme of maneuver for each option.				
Determined a task organization and assigned specific missions and/or tasks to subordinate elements.				

5. When planning as a <u>platoon leader</u>, did you normally sketch out or draw the COAs (on a map, in a digital system, using a terrain model, note pad, or in the dirt or sand table)?
Yes No (circle answer)

a. <u>*If yes*</u>, did seeing the COA assist in analysis or planning? Yes No

b. <u>*If yes*</u>, did seeing the selected COA assist subordinates in understanding your concept for the mission? Yes No

For questions 6 – 9, please consider your experience as a company commander.

6. Consider the time available and the circumstances when you conducted tactical planning **as a company commander**. For the question below, mark the **ONE** statement that was most typical of your experience.

_____ I was never provided time to plan/prepare for the next mission.

_____ The battalion did the planning. My company prepared for the operation based on the battalion order.

_____ My battalion commander provided a limited amount of time (less than ½ of the time available) to plan and prepare when the time was available.

_____ My battalion commander provided half (1/2) of the time available for planning and preparation to subordinates.

_____ My battalion commander attempted to provide two-thirds (2/3) of the time available for planning and preparation to subordinates.

_____ My battalion commander attempted to provide more than two-thirds (2/3) of the time available for planning and preparation to subordinates.

7. Consider sub-step of TLP Step 3, Make a Tentative Plan. Due to time constraints, the situation, and/or conditions sub-steps are often omitted. **Please characterize your actions when conducting TLP in your company.** Indicate the frequency with which you executed each of the sub-steps, as a company commander.

Sub-steps to Step 3: Make a Tentative Plan	**Frequency**			
	Always	**Usually**	**Seldom**	**Never**
A detailed mission analysis was conducted using the factors of mission, enemy situation, terrain, troops available, time available, and civilian considerations (METT-TC).				
The enemy situation and terrain were analyzed and COAs were developed.				
Each feasible COA was analyzed.				
COAs were compared. Risk, future operations, and flexibility were considered.				
A tentative COA was selected. However, reconnaissance and refinement of the order continued.				

8. Continuing to consider TLP Step 3, Make a Tentative Plan, think about the process or steps you used to determine how you would accomplish the mission. **Focus on your process as commander to develop a COA for your company.** Indicate the frequency with which you executed each of the sub-steps to TLP Step 3, making a tentative plan, as a company commander.

Sub-steps to Step 3: Make a Tentative Plan	**Frequency**			
	Always	**Usually**	**Seldom**	**Never**
Analyzed relative combat power based on the known or possible enemy, the terrain, and the forces and fires available to me.				
Generated options for fires, positioning, and maneuver.				
Determined an initial array of forces for each option.				
Developed a scheme of maneuver for each option.				
Determined a task organization and assigned specific missions and/or tasks to subordinate elements.				

9. When planning as a company commander, did you normally sketch out or draw the COAs (on a map, in a digital system, using a terrain model, note pad, or in the dirt or sand table)?
Yes No (circle answer)

a. *If yes*, did seeing the COA assist in analysis or planning? Yes No

b. *If yes*, did seeing the selected COA assist subordinates in understanding your concept for the mission? Yes No

For the remaining questions (10 through 14) in SECTION II, PLANNING EXPERIENCE, please consider ALL your experiences planning and executing tactical operations.

10. During mission planning, did you "war game" or think through the COAs as to how the battle would develop? Yes No (circle answer)

If ***yes***, please answer Question 11.

If ***no***, skip Question 11.

11. When you "war gamed" or thought through your COAs, what factors did you consider? Indicate the frequency with which you considered each factor. If you considered other factors, please add them to the bottom of the list and indicate the frequency for each.

Course of action (COA) factors	**Frequency**			
	Always	**Usually**	**Seldom**	**Never**
The flow of the battle and/or execution of the mission.				
The relative position, composition, and/or disposition of my subordinate elements at points or phases of the battle.				
Enemy dispositions, their probable courses of action or reactions.				
Characteristics of the terrain in my area of interest and the effects of the terrain on my maneuver and fires.				
Possible actions or reactions that may be required to counter enemy actions.				
Critical tasks that must be accomplished.				
Desired end state.				

12. Did you **normally** compare aspects of more than one COA when selecting your concept of the operation, maneuver scheme, and /or scheme of fires?
Yes No (circle answer)

13. For **defense planning**, please indicate the value that you generally gave to a defensive factor when developing or comparing COAs. Place an "X" in the appropriate box.
In the space provided at the end of the chart list and rate any other factors you considered.

	Using the scale below, rate the value of each defensive factor used during your COA analysis.				
Defensive Factors	**Very valuable**	**Valuable**	**Limited value**	**No value**	**Usually not considered**
Placement of organic crew served weapons					
Placement of attached weapons					
Enemy avenues of approach					
Time available to prepare defenses and positions					
Natural obstacles					
Placement of engineer obstacles					
Friendly long-range observation/fires					
Placement of forces for early warning and security					
Alternate and supplemental positions					
Routes within the defensive position					
Experience of subordinate units/leaders					
Attachments and/or detachments					
Organization of subordinate elements					
Assignment of tasks to subordinate elements					
Required control measures					
Placement of unmanned ground sensors (UGS)					
Employment of IR, thermal, and I^2 systems					
Employment of unmanned aerial vehicles (UAVs)					

14. For **offensive planning,** please indicate a value for each offensive factor you usually considered when developing or comparing COAs. Place an "X" in the appropriate box. In the space provided at the end of the chart list and rate any other factors you considered.

	Using the scale below, rate the value of each offensive factor used during your COA analysis.				
Offensive Factors	**Very valuable**	**Valuable**	**Limited value**	**No value**	**Usually not considered**
Avenues of approach (AA) & routes to the objective					
Known/probable enemy positions					
Your formations					
Placement/location of attachments and/or supporting elements					
Time available to prepare					
Anticipated obstacles (natural and enemy)					
Locations providing long-range fires and/or observation along or near AA & routes					
Task organization of your forces					
Employment of forces for early warning and security					
Required control measures					
Tasks and missions to be assigned to your subordinate elements					
Experience of subordinate units/leaders					
Employment of IR, thermal, and I^2 systems					
Employment of unmanned aerial vehicles (UAVs)					

SECTION III. Using OOS to Assist with Tactical Planning

For the items of this section, consider the information provided in the presentations, the COA runs/demonstrations, and your brief experience in setting up a scenario with the OOS system.

1. When time and the situation permit TLP, what planning steps could be enhanced or assisted by OOS? (Note that some aspects of TLP have been blanked out / omitted.)

TLP Steps/Sub-Steps	Rate the potential helpfulness of OOS to support the Steps and/or Sub-steps of TLP			
	Very helpful	Helpful	Possibly helpful	Not helpful
1. Receive the mission.				
a. Begin an analysis of the mission using the factors of METT-TC.				
b. Schedule your work in the time available.				
2. Issue a warning order.				
3. Make a tentative plan.				
a. Conduct a detailed mission analysis.				
b. Conduct a situation analysis and develop COAs.				
c. Analyze each COA.				
d. Compare the COAs.				
e. Make a decision on the best COA based on your current estimate.				
4. Start necessary movement.				
5. Conduct a reconnaissance (map only).				
6. Complete the plan.				
7. Issue the order to your subordinates.				
8. Supervise preparations for the mission.				
a. Conduct rehearsals.				
b. Conduct inspections/reinspections				

2. Listed below are some of the tools and features of OOS you observed during the demonstration runs and worked with during the practical application exercise. Indicate (x) the relative helpfulness of the tools and features you observed or used in OOS to support platoon and company TLP and planning.

	Check boxes for both the company and platoon for each function							
OOS Function	**Company**				**Platoon**			
	Very Helpful	**Helpful**	**Possibly Helpful**	**Not Helpful**	**Very Helpful**	**Helpful**	**Possibly Helpful**	**Not Helpful**
High resolution digital terrain database of the Area of Operations (AO).								
Zoom/pan the map.								
Employ the line of sight tool.								
Select entities/units (friendly/enemy) with realistic capabilities.								
Place entities and units in desired formations and locations.								
Create the desired task organization.								
Place control measures on map.								
Assign missions to entities/units (friendly/enemy).								
Run simulated mission and/or COA.								
Execute multiple runs of a mission and/or COA. Outcomes varied.								
Compress the run times for missions and COAs.								
Halt runs and/or entities/units at desired locations or times.								
Modify orders for entities/units.								
Determine status of entities/units.								
Analyze and/or compare results of multiple COAs.								

3. Indicate the extent to which the OOS capabilities you observed and experienced could assist and support the planning process in a maneuver company or company team.

	Indicate (X) the extent of your agreement regarding each OOS capability.			
OOS capability	**Very Helpful**	**Helpful**	**Possibly Helpful**	**Not Helpful**
Assists with initial mission analysis.				
Assists with detailed mission analysis and estimate of the situation.				
Assists with COA development.				
Assists with the analysis of a COA.				
Allows runs of multiple COAs to assist with COA comparison.				
Assists with arriving at an initial decision/COA selection to focus mission preparation efforts.				
Assists with refining the focus of leader reconnaissance.				
Assists with the review of terrain and/or operational details to complete the plan.				
Assists with issuing the order by providing a visual depiction of anticipated actions during the operation.				
Assists with aspects of mission rehearsal.				

4. Based on your experience and observations, list any other OOS capabilities or functions that could be of assistance in or support TLP and the planning process.

_____

_____

_____

_____

5. Please rate the ease of using each of the following OOS functions.

OOS functions	Rate the ease of using each OOS function				
	Very simple	Simple/ Not Difficult	Difficult	Very Difficult	Impossible to Use
Locate, select, and load the terrain database in OOS.					
Select and place forces on the map.					
Arrange forces in desired tactical formation.					
Configure the force to match a desired task organization.					
Assign missions to the elements and units.					
Place control measures on the map.					
Run a COA once.					
Determine the outcome of a run/scenario.					
Run a COA multiple times.					
Modify a scenario to permit runs of multiple COAs.					

6. Given your experience with OOS, rate the usefulness of each OOS function or capability.

OOS functions and capabilities	Indicate your assessment of the utility of each OOS capability or function to tactical planning in a company.				
	Very useful	Useful	Possibly useful	Not useful	Detracted from the planning effort
Locate, select, and load the terrain database in OOS.					
Select and place forces on the map.					
Arrange forces in desired tactical formation.					
Configure the force to match a desired task organization.					
Assign missions to the elements and units.					
Place control measures on the map.					
Run a COA once.					
Determine the outcome of a run/scenario.					
Run a COA multiple times.					
Modify a scenario to permit runs of multiple COAs.					

7. Given your limited training on OOS, rate how well you think you will retain or remember how to use each of the OOS functions or capabilities.

OOS functions and capabilities	Indicate how well you think you will remember how to use each OOS functions or capabilities.				
	Will retain for several months	**Will remember for about a month**	**Will need some refresher after a couple weeks**	**Will need some refresher after a few days**	**I've already forgotten; need refresher now**
Locate, select, and load the terrain database in OOS.					
Select and place forces on the map.					
Arrange forces in desired tactical formation.					
Configure the force to match a desired task organization.					
Assign missions to the elements and units.					
Place control measures on the map.					
Run a COA once.					
Determine the outcome of a run/scenario.					
Run a COA multiple times.					
Modify a scenario to permit runs of multiple COAs.					

8. Based on your experience with OOS and other aids / simulation systems, select the **one phrase** that best characterizes the <u>complexity</u> of OOS as a potential planning tool.

____ OOS is **much more complex** than other aids and systems
____ OOS is **more complex** than other aids and systems
____ OOS is **similar in complexity** to other aids and systems
____ OOS is **less complex** than other aids and systems
____ OOS is **much less complex** than other aids and systems
____ I have no experience with other aids and systems on which to base my assessment.

9. Based on your experience with OOS and other aids / simulation systems, select the **one phrase** that best characterizes the <u>potential value</u> of OOS as a planning tool.

____ OOS is **much more valuable** than other aids and systems
____ OOS is **more valuable** than other aids and systems
____ OOS is **similar in value** to other aids and systems
____ OOS is **less valuable** as a planning tool than other aids and systems.
____ OOS is **much less valuable** as a planning tool than other aids and systems.
____ I have no experience with other aids and systems on which to base my assessment.

10. What changes (additions/deletions/modifications) could be made to OOS to make it more useful as a planning tool for companies and platoons?

SECTION IV. Use of OOS for Institutional Training

OOS is designed to enable high resolution simulations for exercises and analysis. You received training on a very limited set of OOS functions/capabilities and in a short timeframe. The training was focused to introduce you to only selected functions that have potential to support small unit (platoon and company) planning. The remaining items ask for your input on the potential value of using OOS in institutional training.

1. Assume that students would receive a 4-hour block of training on OOS, in a group setting, similar to the introduction you received today. Based on this limited training on each of the OOS functions, provide your assessment of what additional training / training support would most likely be required if students are to use OOS for planning and COA analysis in the MCCC.

OOS functions	** CHECK ALL THAT APPLY **			
	More Instruction & Demos	More Practice Exercises	Job Aid / Handout	Detailed Users' Guide
Locate, select, and load the terrain database in OOS.				
Select and place forces on the map.				
Arrange forces in desired tactical formation.				
Configure the force to match a desired task organization.				
Assign missions to the elements and units.				
Place control measures on the map.				
Run a COA once.				
Determine the outcome of a run/scenario.				
Run a COA multiple times.				
Modify a scenario to permit runs of multiple COAs.				

2. Please comment on ways you would modify or change aspects of the training to improve it.

3. Would OOS, in its current form, be a useful instructional and training tool in what courses?

Yes No

If "No", what are the major shortcomings/drawbacks to using it?

If yes, how could it be integrated?

Appendix C

OOS Quick Start Guide

The layout of the Quick Start Guide was designed for the purpose of printing the guide front and back on 67lb cardstock, cutting the letter sized stock in half, and binding it into booklets.

One Semi-Automated Force Objective System

Quick Start Guide

Overview

This guide describes the steps required for a new user to operate the OOS simulation software, select and configure military forces, develop a tactical scenario, assign missions and control measures, and run and determine the outcome of the scenario.

The steps will follow the sequence outlined in the table of contents.

The majority of the steps will be inputted in the windows listed below:

- **Plan View Display (PVD) Window**: a 2 dimensional representation of the terrain (scaleable map), graphic control measures, units, etc. It is where the simulation runs graphically to allow you to view your plan and the simulation unfolding.

- **Task Organization Window**: used to add and delete troops and units to your simulation. Automatically defaults to two sides **Coalition** and **Insurgents**

- **Mission Editor Window**: where the units in the Task Organization window are assigned tasks to perform

- **Status Window:** used to determine outcome of scenario

Table of Contents

1.....Start-Up

3.....Open a New Scenario

5.....Saving a Scenario

7.....Locate, Select, and Load the Terrain Database

10.....Select and Place Forces on a Map

14.....Configure the Force to Match a Desired Task Organization

18.....Scenario Development Tools

22.....Place Control Measures on a Map

26.....Assign Missions to Entities and Units

32.....Run a Scenario

34..... Determine Outcome of Scenario

36.....Stop and Reload a Scenario

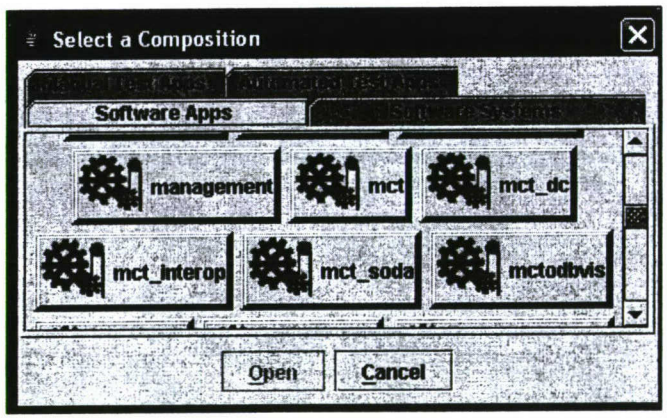
38.....Shut Down Procedures

Notes

OOS Quick Start Guide – **START-UP (1of 2)**

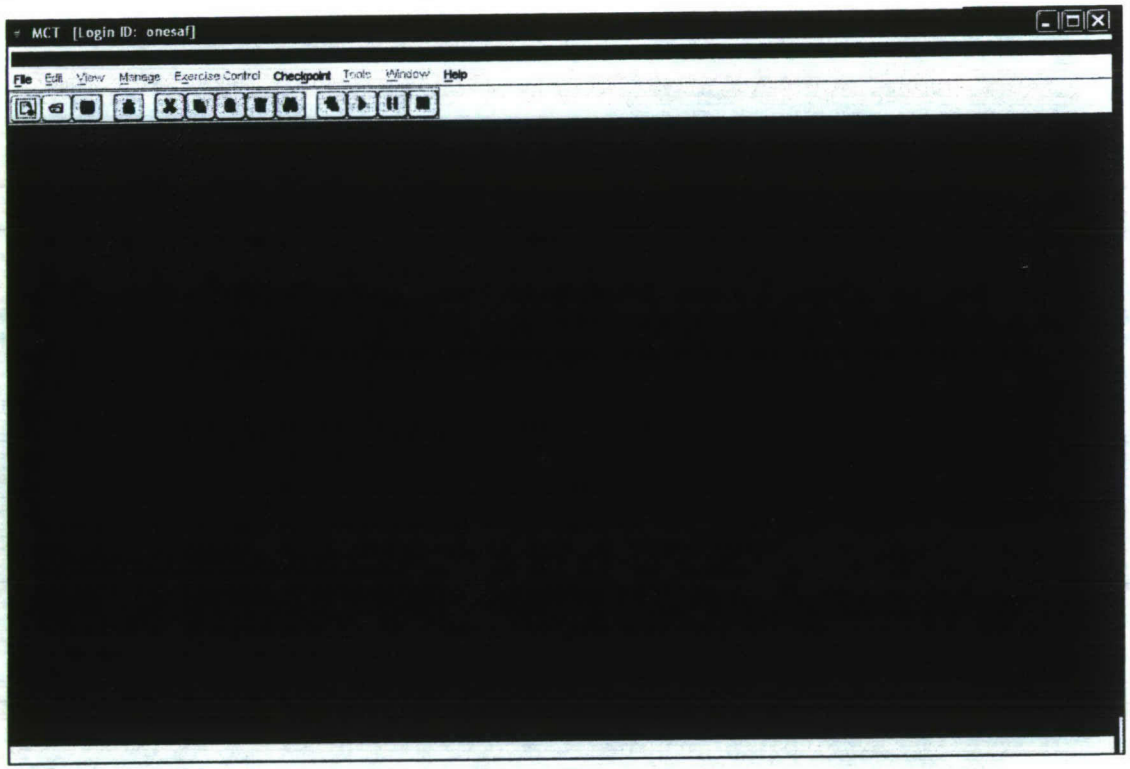
Double left-click on the **Runtime Loader** icon in the Windows start-up window

Scroll down to **MCT** icon and left-click once to select, then left-click once on **Open**.



1

OOS Quick Start Guide – **START-UP (2 of 2)**

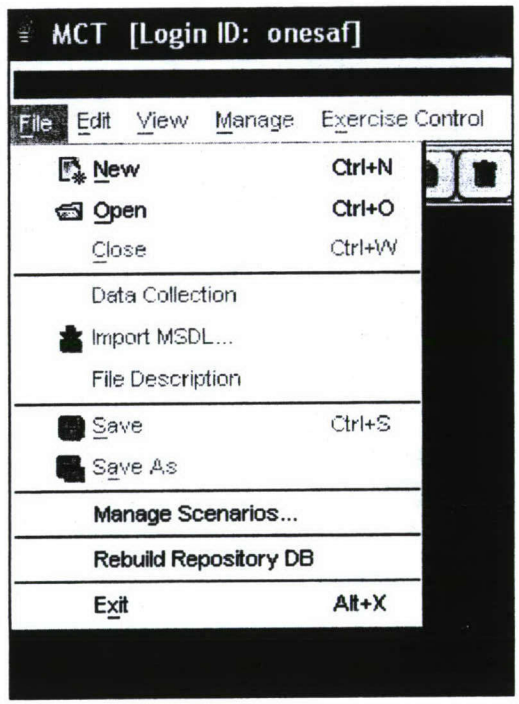


2

This is the first screen of OOS

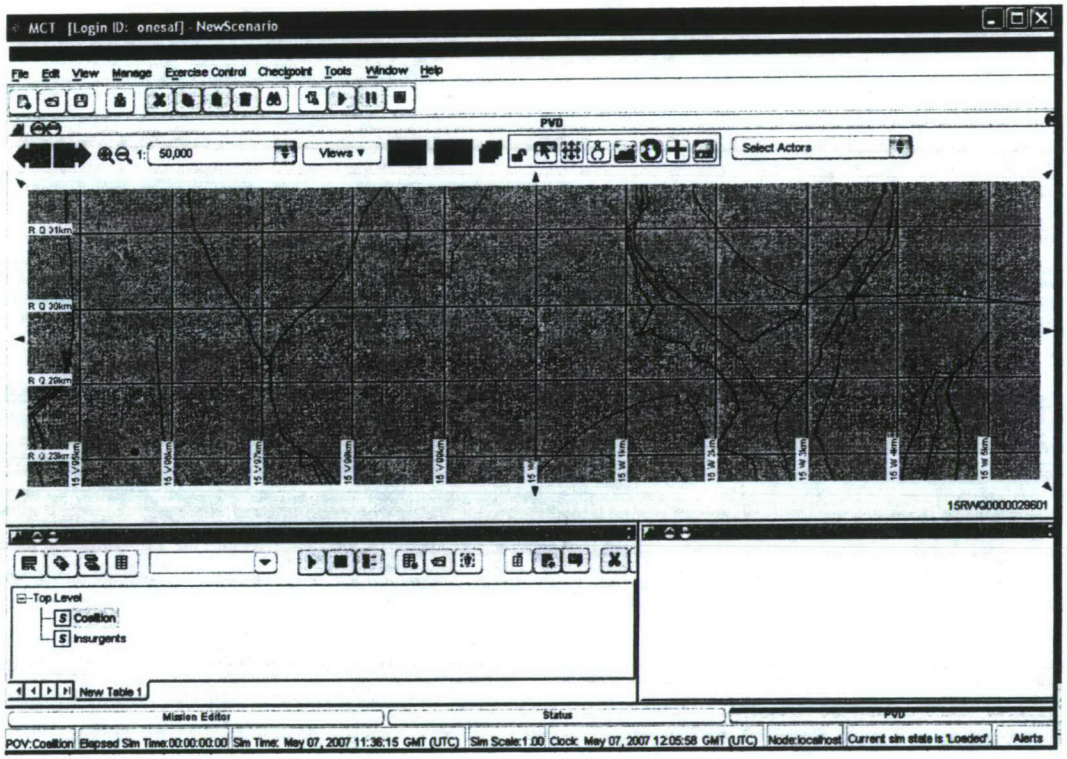
OOS Quick Start Guide – **OPEN A NEW SCENARIO (1 OF 2)**

Left-click **File**, mouse over **New** and left-click



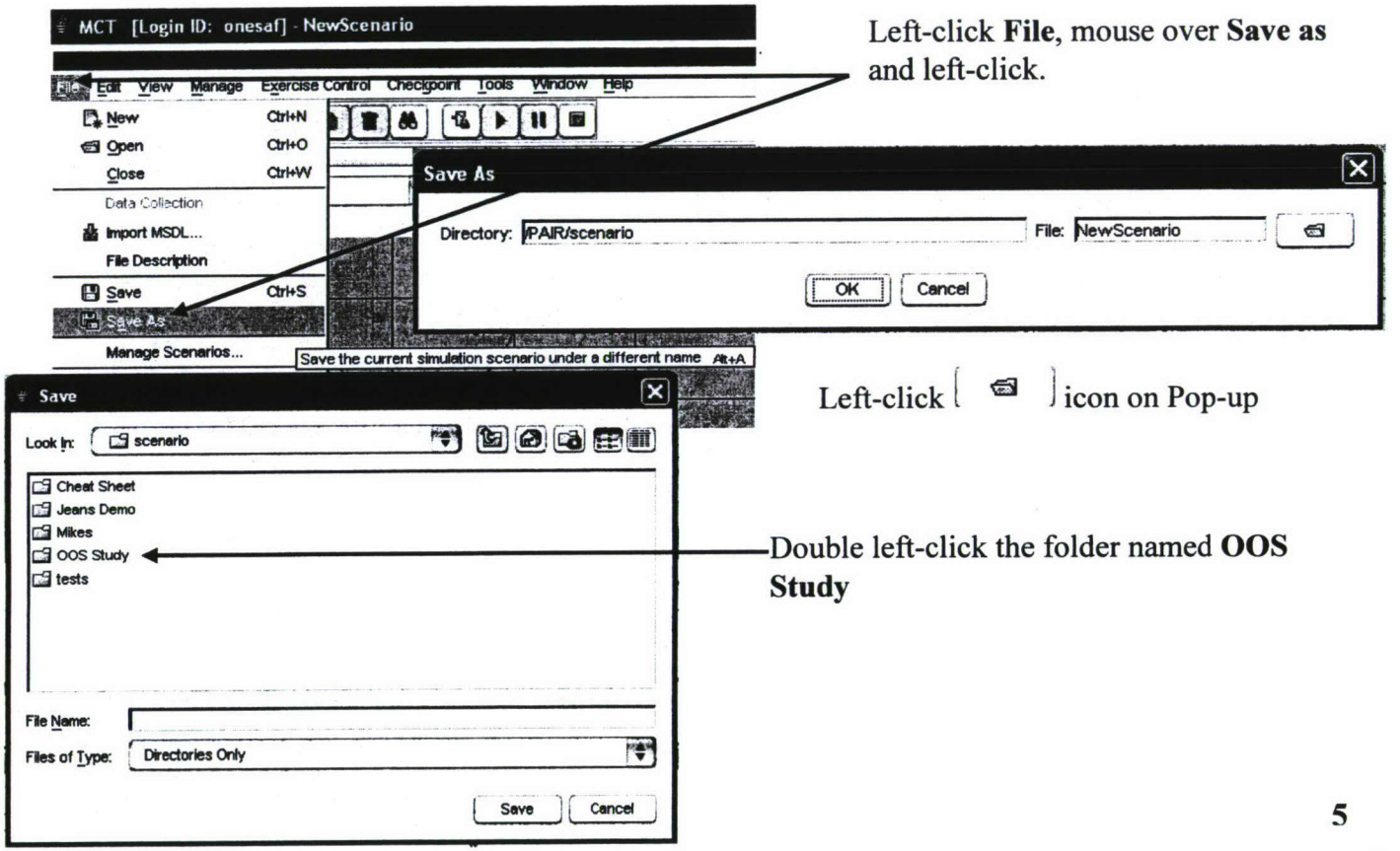
3

OOS Quick Start Guide – **OPEN A NEW SCENARIO (2 OF 2)**



4 First window of a **New Scenario.**

OOS Quick Start Guide – **SAVING A SCENARIO (1 of 2)**



Left-click **File**, mouse over **Save as** and left-click.

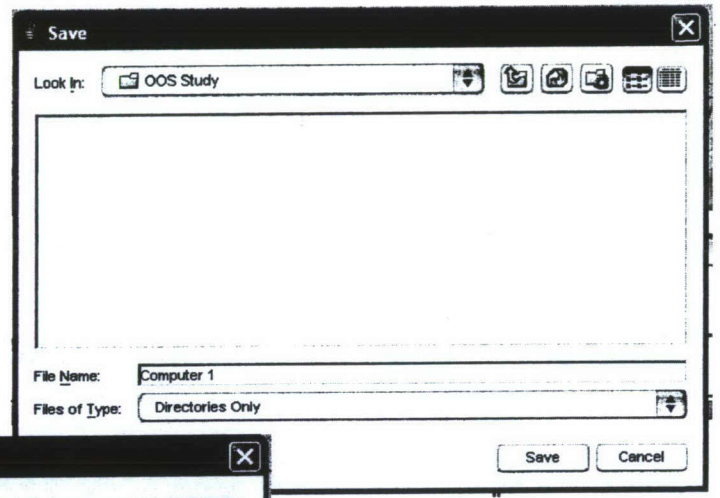
Left-click [ ] icon on Pop-up

Double left-click the folder named **OOS Study**

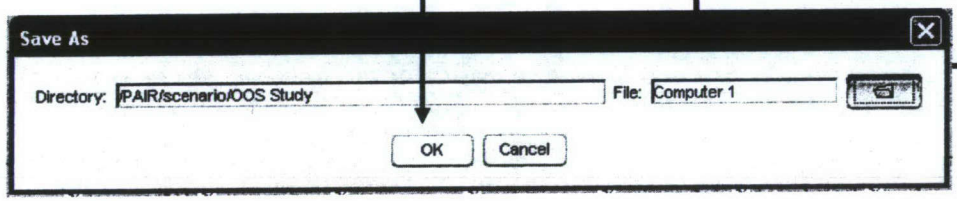
5

OOS Quick Start Guide – **SAVING A SCENARIO (2 OF 2)**

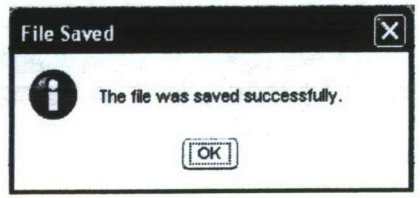
In the **File Name** type in **Computer** and the corresponding computer number you are working with and left-click the **Save** button.



Left-click **OK** on the Pop-up window

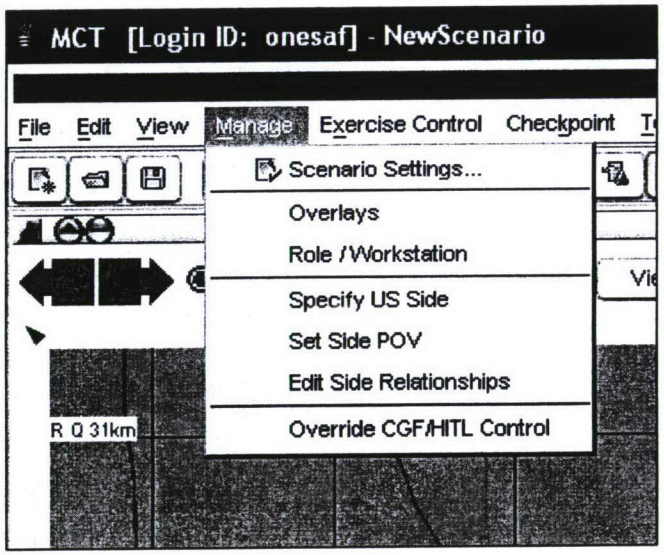


Left-click **OK** on the last Pop-up window acknowledging that the file was saved successfully



6

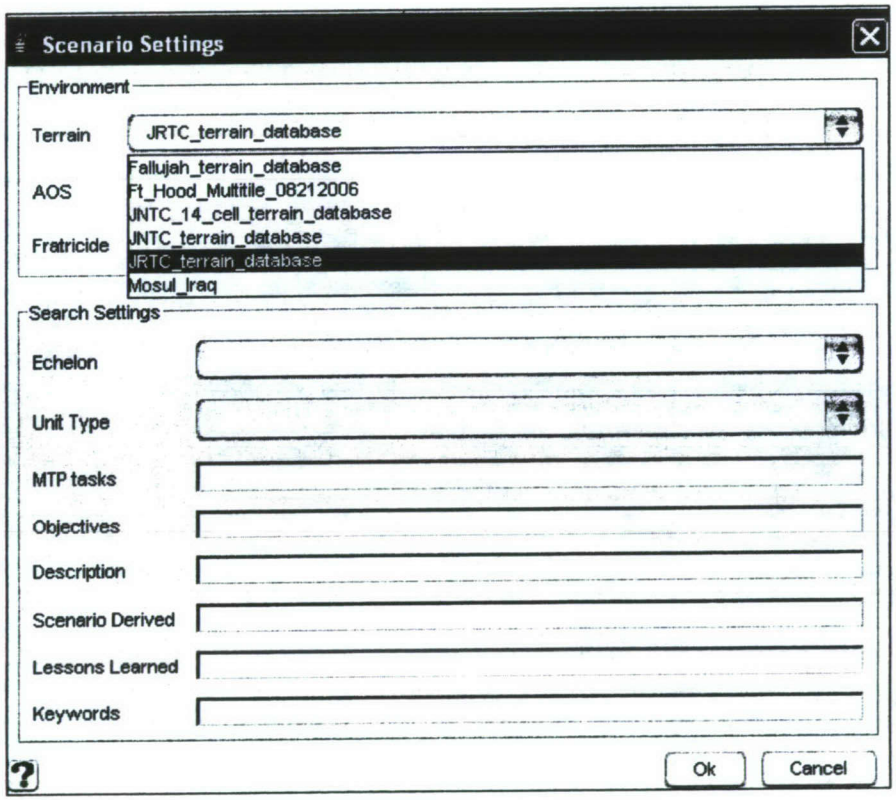
OOS Quick Start Guide – LOCATE, SELECT, AND LOAD THE TERRAIN DATABASE (1 OF 3)



Left-click on **Manage** and then mouse over **Scenario Settings** and left-click once.

7

OOS Quick Start Guide – LOCATE, SELECT, AND LOAD THE TERRAIN DATABASE (2 OF 3)

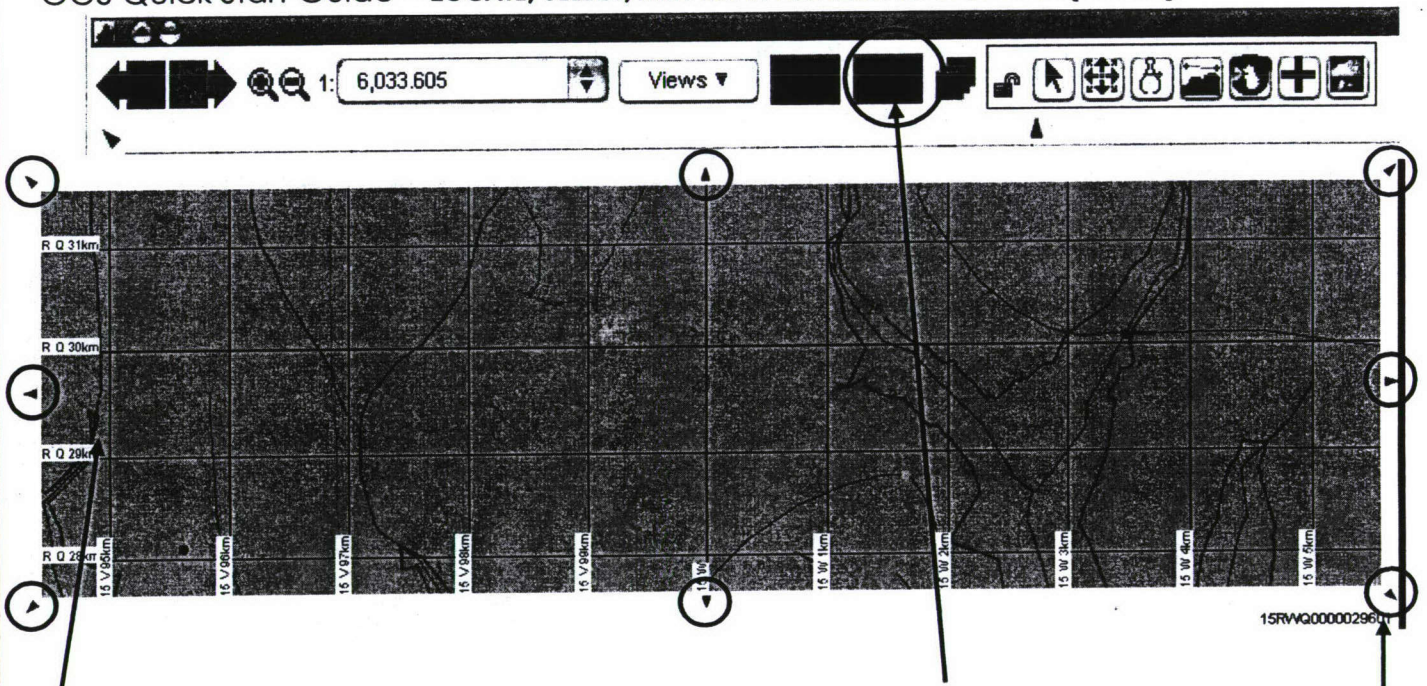


Use the drop-down menu to expose all of the terrain databases available.

Select **JRTC_terrain_database** and then left-click **OK**.

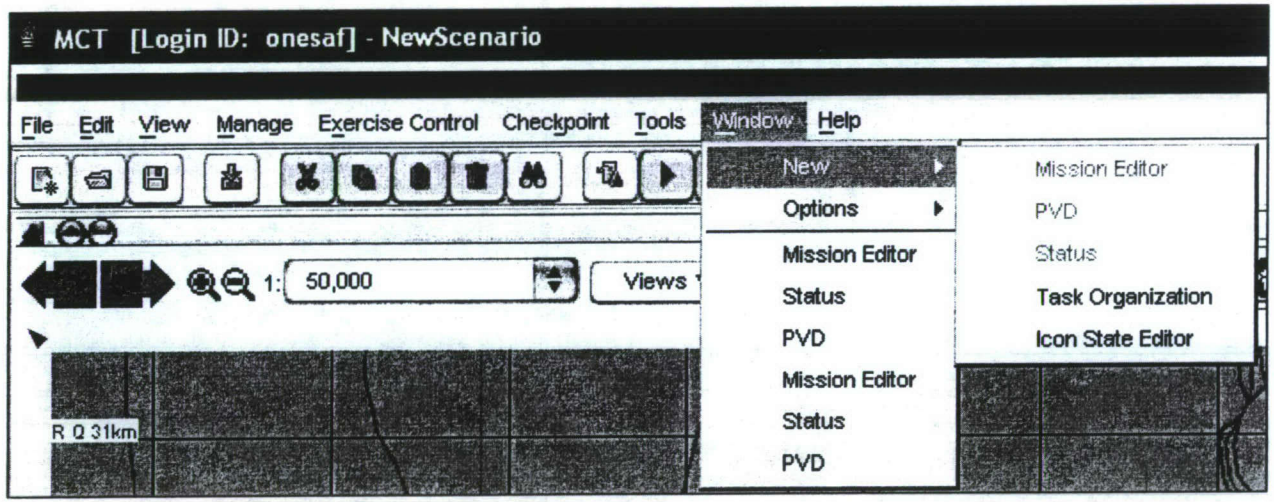
8

OOS Quick Start Guide – LOCATE, SELECT, AND LOAD THE TERRAIN DATABASE (3 OF 3)



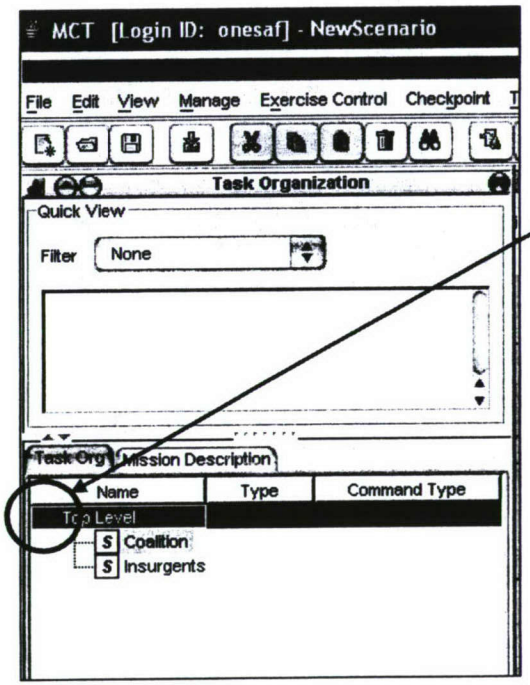
The map can be centered in two ways. 1. Left-click the **Go to Coordinates** icon and input the MGRS grid location **15RVQ8874642253**, left-click **Apply**, and left-click **OK.** Or, 2. Center the map on the desired terrain by using the **Pan Arrows** and the **MGRS grid** located in the lower right hand corner of the map.

OOS Quick Start Guide – SELECT AND PLACE FORCES ON THE MAP (1 OF 7)



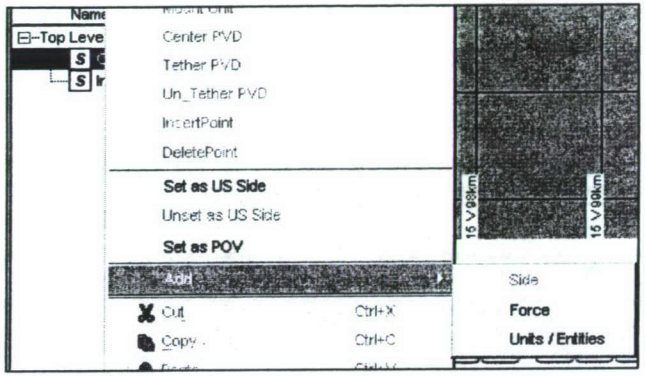
On top tool bar, Left-click **Window**, Mouse over **New – Task Organization** and left-click.

OOS Quick Start Guide – SELECT AND PLACE FORCES ON THE MAP (2 OF 7)



Under the Task Org tab, Expand **Top Level** by left-clicking on the plus sign.

OOS Quick Start Guide – SELECT AND PLACE FORCES ON THE MAP (3 OF 7)

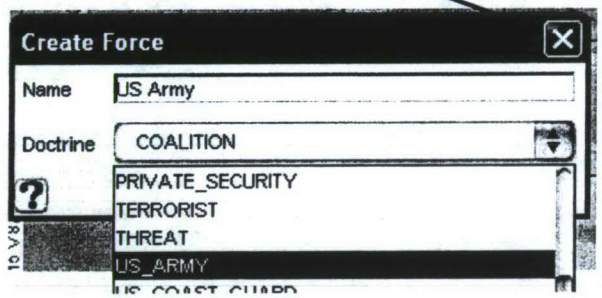


Expand **Coalition** by left-clicking on the **plus sign**

Right-click **Force**
Mouse over **Add – Units/Entities** and left-click

Right-click **Coalition.**
Mouse over **Set as US Side** and left-click.

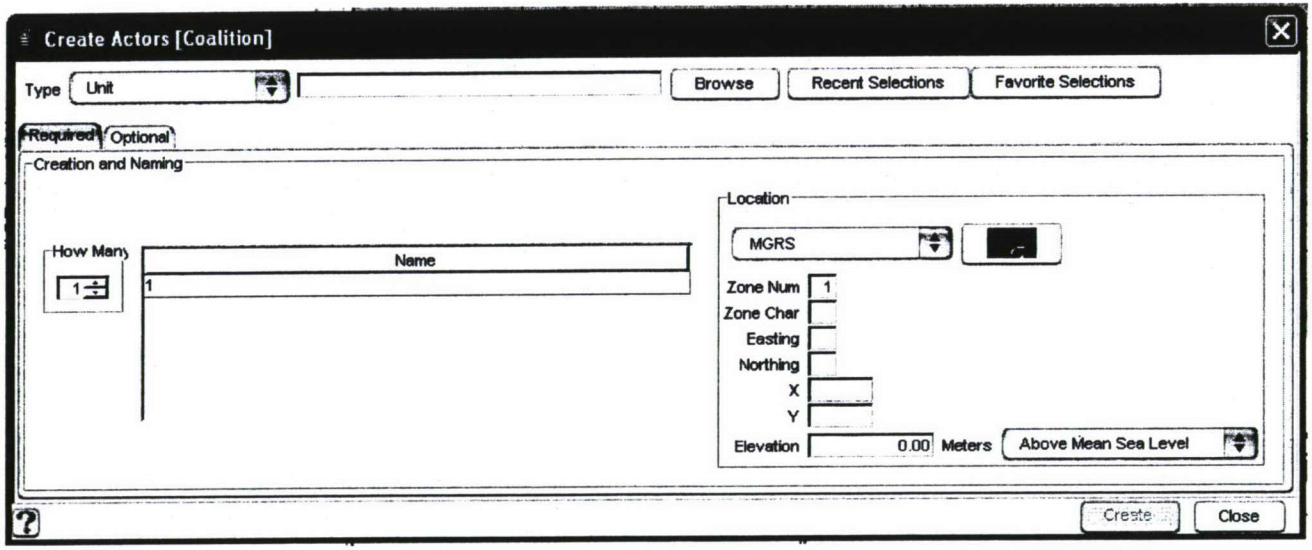
Right-click **Coalition.**
Mouse over **Add – Force** and left click.
Name the **Force.**
Use the drop down menu to select the **Doctrine**.
Left-click **Apply.**
Left-click **Red X** to close.



Entities- are an individual combatant (IC) or piece of equipment.
Unit- is a collection of two or more individuals.

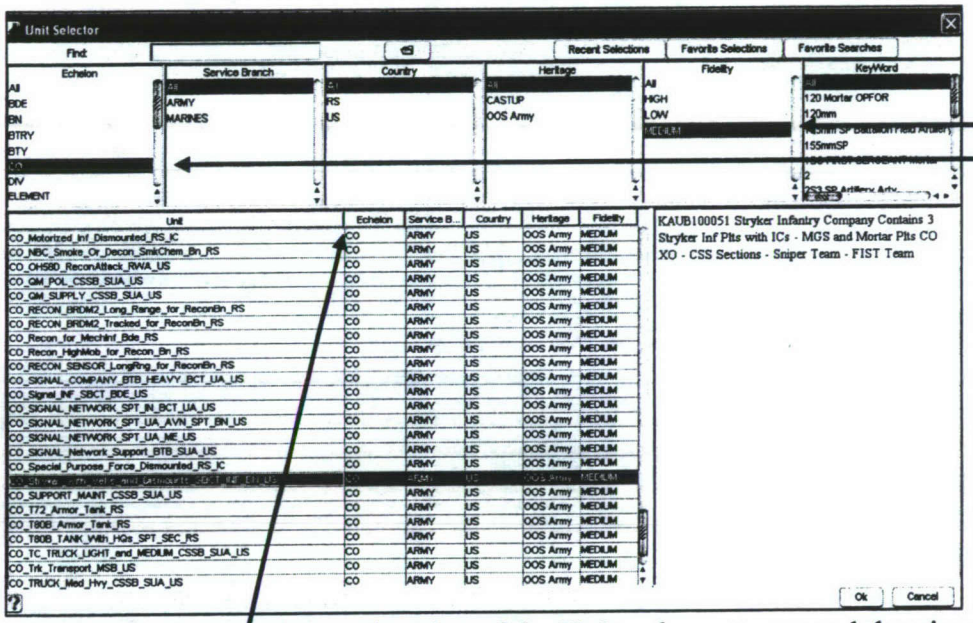
12

OOS Quick Start Guide – **SELECT AND PLACE FORCES ON THE MAP (4 of 7)**



Left-click **Browse**

OOS Quick Start Guide – SELECT AND PLACE FORCES ON THE MAP (5 of 7)



Apply filters **(CO and Medium)** in the **Echelon** and **Fidelity** columns to narrow down your selection of units available.

Left-click, ***hold***, and drag the edge of the **Unit** column to expand the view.

Scroll down to **CO_Stryker_with_Vehs_and_Dismounts_SBCT_INF_BN_US**, left-click on unit/entity, then left-click on **OK** in lower right corner of the screen.

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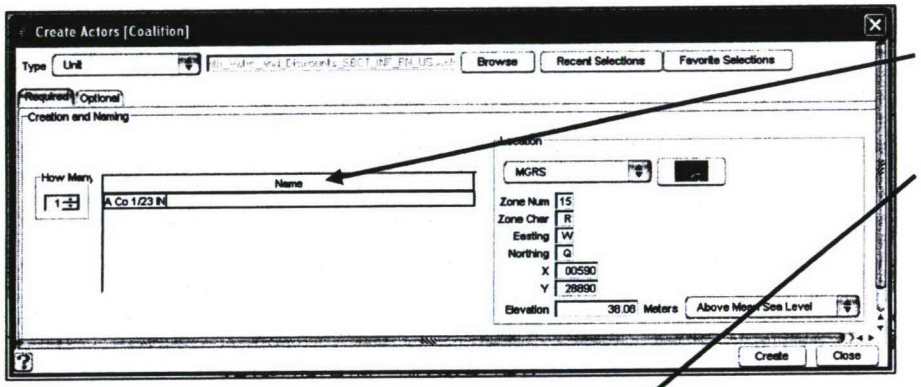
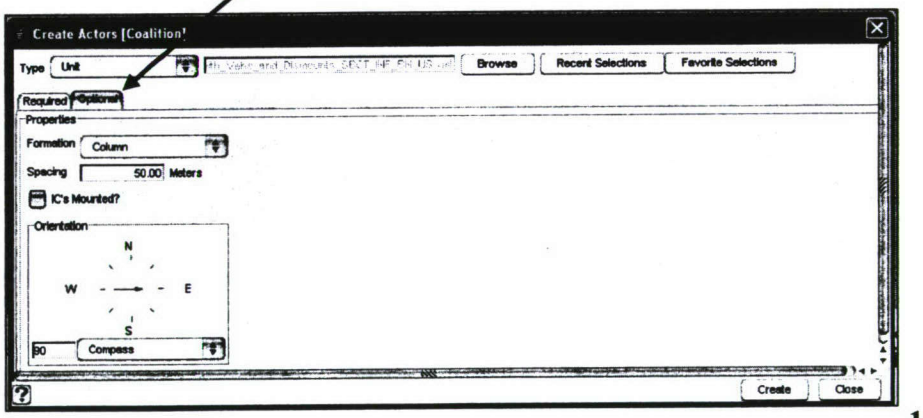
OOS Quick Start Guide – **SELECT AND PLACE FORCES ON THE MAP (6 OF 7)**



Name the unit by double left-clicking in the **Name line**.

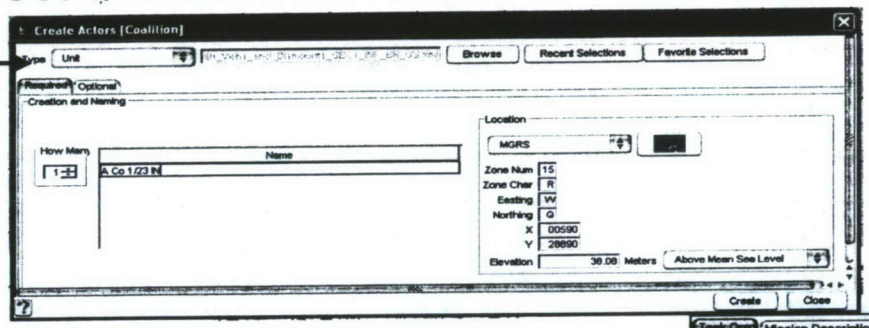
Select the **Option Tab** to orient the unit, place it in a movement formation, determine spacing between elements, and mount the Individual Combatants (IC).

Position the unit on the map by either typing in a 10 digit grid, or left-clicking once on the **Red Arrow** in the **Location Box**, positioning the cursor on the map at the desired location and left-clicking once to activate the map, and left-click once more to place the unit/entity.



15

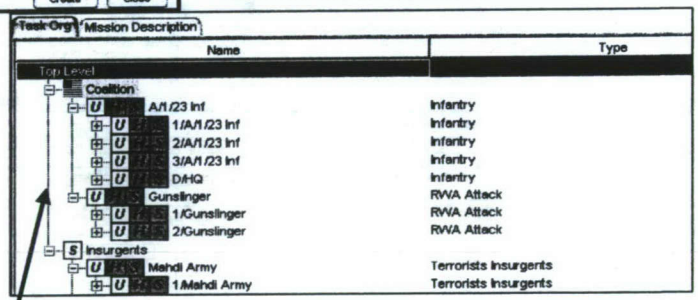
OOS Quick Start Guide – SELECT AND PLACE FORCES ON THE MAP (7 OF 7)



Upon completion of the previous steps left-click on the **Create** button in the lower right corner. The system will process the command and place the unit on the map where selected. The processing time varies based on size of unit selected.

Select the Opposing Forces in the same manner as the Coalition forces.

There are 2 different steps. 1. In the **Type** drop down window, select **Entity** instead of **Unit.** 2. Scroll down and select **Terroist_AK74** in the **Entity Selector** window.

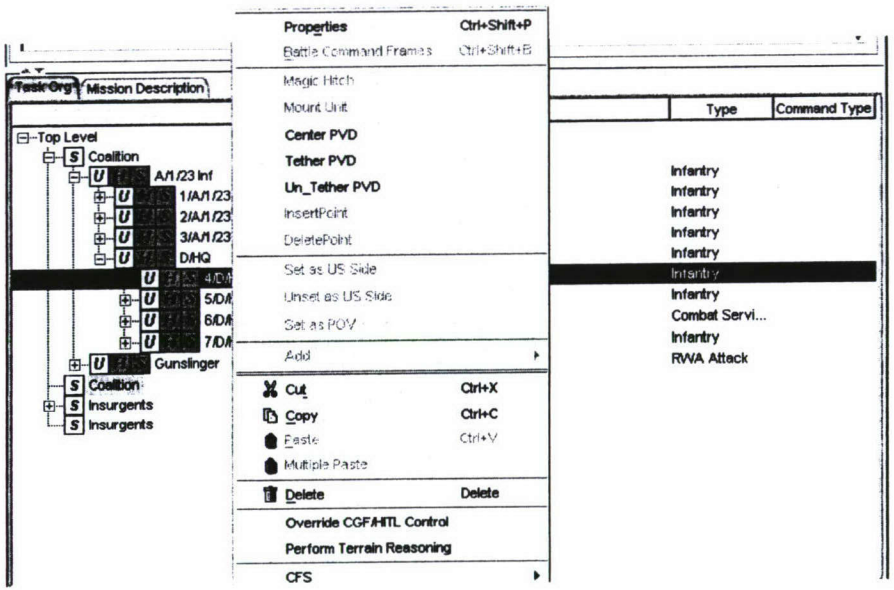


When complete the **Task Organization** window will show forces on both the **Coalition** and **Insurgents sides.**

WARNING: Save scenario
File → Save

16

OOS Quick Start Guide – **CONFIGURE THE FORCE TO MATCH A DESIRED TASK ORGANIZATION**



OOS allows you to modify the Task Organization by deleting single Soldiers, or groups of Soldiers.

In order to modify the Task Organization expand the unit to be modified by left-clicking on the **plus sign** next to the named unit

Right-click on the entity or group to be deleted. Mouse over **Delete** and left-click. Confirm the unit to be deleted by left-clicking **Yes.**

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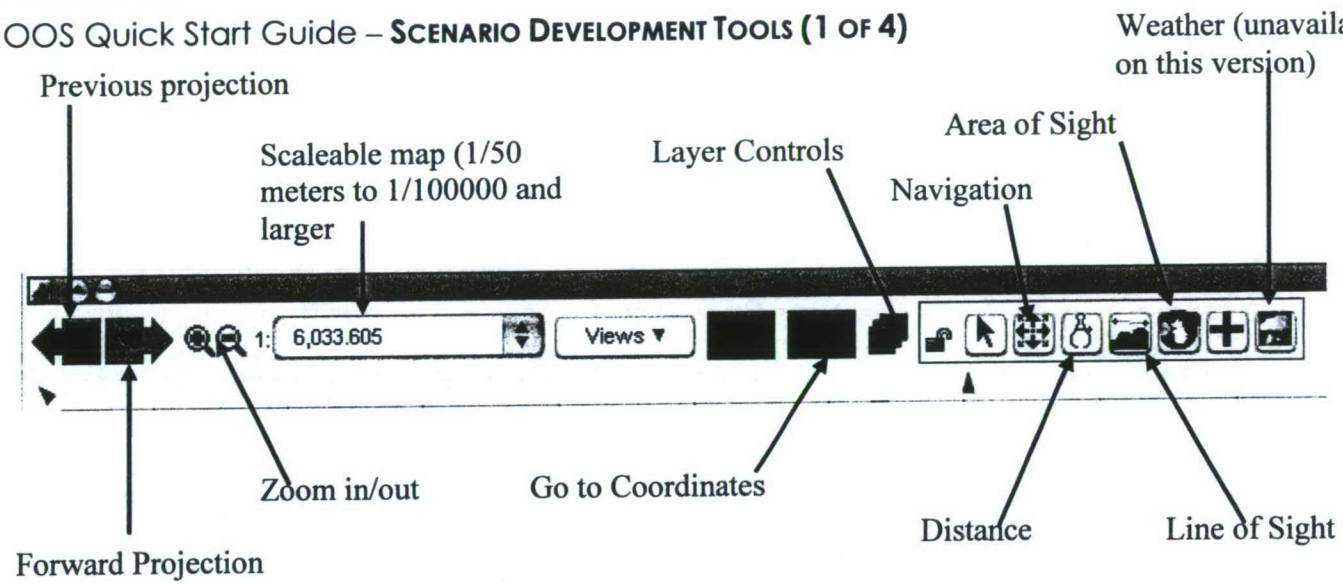
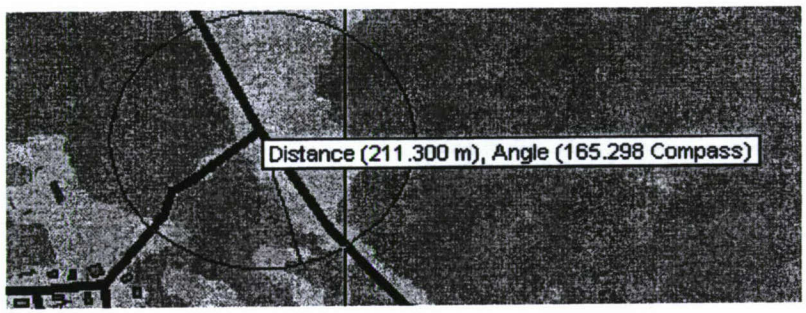
OOS Quick Start Guide – **SCENARIO DEVELOPMENT TOOLS (1 OF 4)**



There are numerous tools available to help develop a tactical scenario. **Distance, Line of Sight,** and **Area of Sight** will be explained in more detail.

18

OOS Quick Start Guide – SCENARIO DEVELOPMENT TOOLS (2 OF 4) – DISTANCE TOOL



The **Distance** tool gives the user the ability to measure straight line distance. The results of the measurement are displayed in meters and the angle of deflection is displayed in degrees. When combined with the 3-D terrain, this tool can be used for time/distance analysis during route development.

Left-click the **Distance** icon. Position the **Arrow Head** at the start location, left-click and drag the **Arrow Head** to the stop location and left-click.

The distance tool allows you to continue legs of the route while adding up the total distance.

Hit **ESC** to clear.

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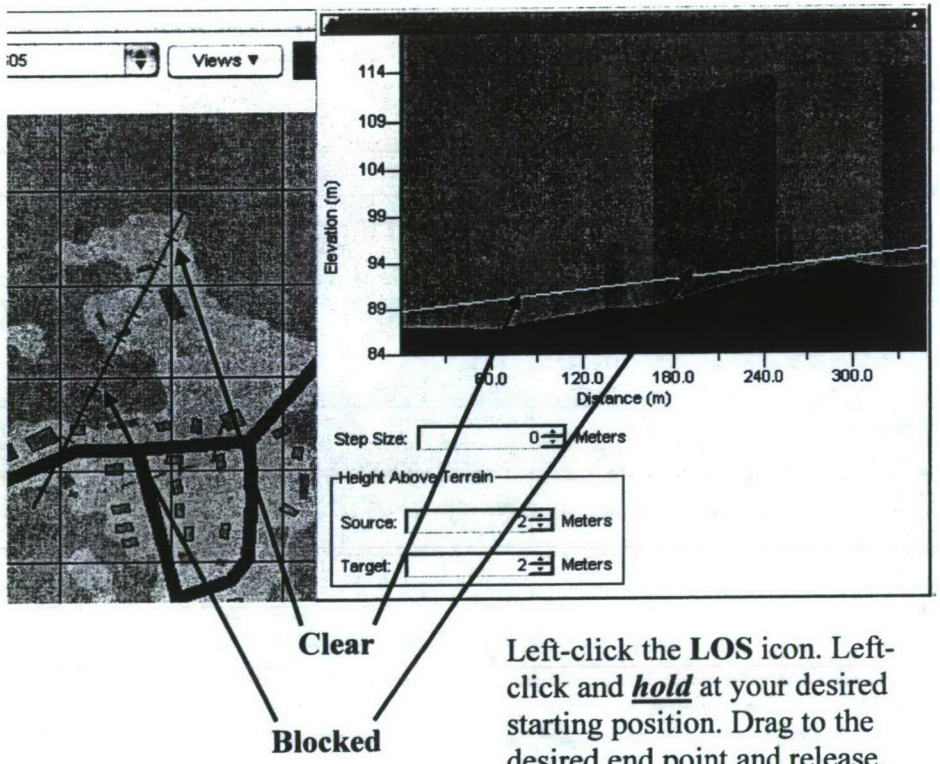
OOS Quick Start Guide – SCENARIO DEVELOPMENT TOOLS (3 OF 4) – LINE OF SIGHT TOOL



Left-click the **LOS** icon. Left-click and ***hold*** at your desired starting position. Drag to the desired end point and release. Hit **ESC** to clear.

The **Line of Sight (LOS)** tool gives the user the ability to get the Soldiers perspective in a straight line from any position on the map. The perspective and target can be adjusted by height. The **LOS** results are displayed in two manners.

1. The **LOS** results are displayed directly on the map. The line is *green* when the **LOS** is clear and *red* where the **LOS** is blocked.

2. The **LOS Palette** displays the same results; however, here the user has the added value of the 3-D terrain. The *solid green* represents the blocked view. The x and y axis display the distance and elevation from the Soldier-to-target perspective.

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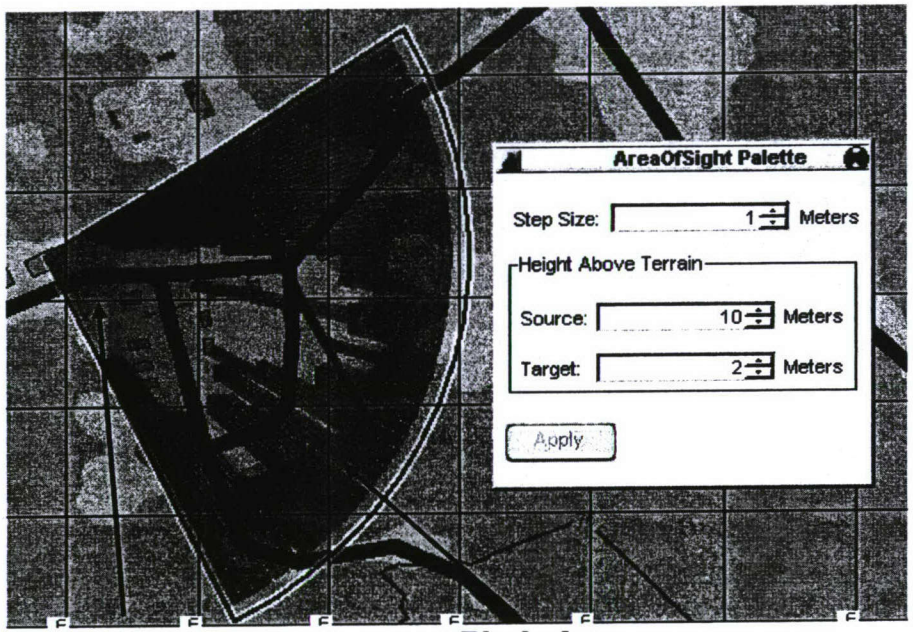
OOS Quick Start Guide – SCENARIO DEVELOPMENT TOOLS (4 OF 4) – AREA OF SIGHT TOOL



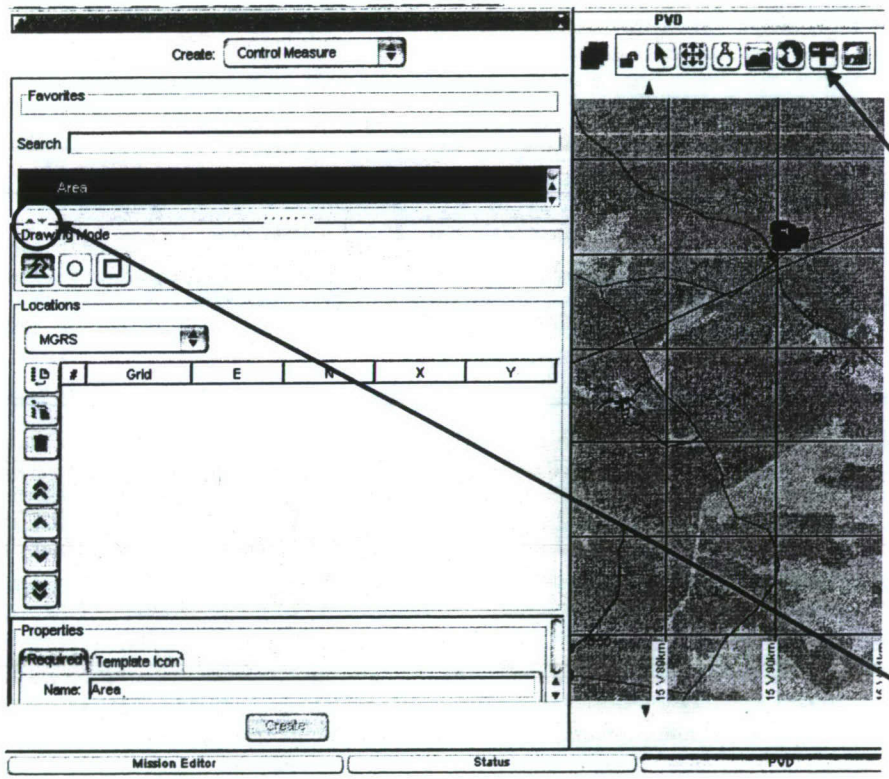
Clear **Blocked**

The **Area of Sight (AOS)** tool gives the user the ability to get the Soldiers perspective in a 1 degree wedge, or up to a 360 degree circle. The results are displayed directly on the map. The *green* displays a clear **AOS** and the *red* displays a blocked **AOS**. The height of the Soldiers perspective can be adjusted by changing the height in meters on the **AOS Palette** and left-clicking **Apply.**

Left-click the **AOS** icon. Position the **Arrow Head** at the desired starting location – right-click to anchor the display. Move the **Arrow Head** to the desired end point – right-click to anchor the display. Move the **Arrow Head** to describe the size of the area to cover, and right-click to complete. Press **ESC** to clear.

21

OOS Quick Start Guide – **PLACE CONTROL MEASURES ON A MAP (1 OF 4)**



Select Actors

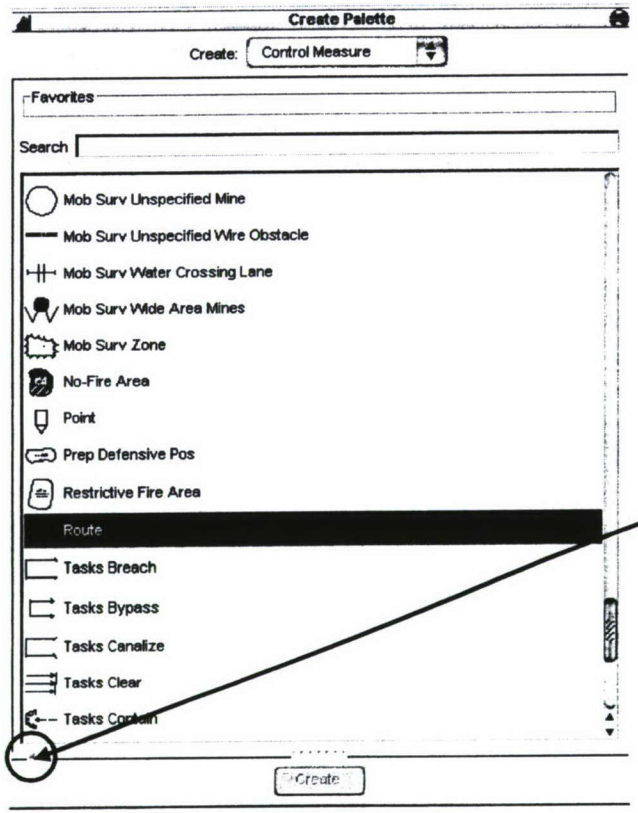
Left-click drop down menu and left-click **"Select Any"**

Left-click the icon located on the **PVD Tool Bar.** The **Control Measure Palette** will appear.

Left Click on the drop down arrow to expand the **Control Measure** selection.

22

OOS Scenario Development – **PLACE CONTROL MEASURES ON A MAP (2 OF 4)**

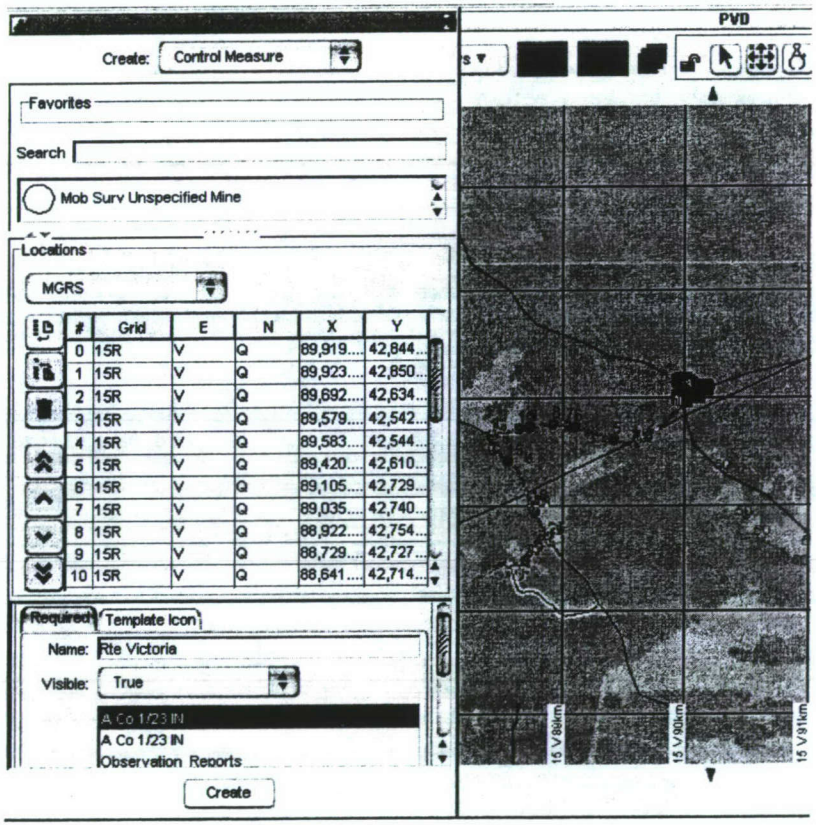


Scroll through the listed **Control Measures** until you find the appropriate one (in this case **Route** has been chosen).

Left-click on the chosen **Control Measure** to highlight it, then minimize the selection box by left-clicking the drop down arrow.

23

OOS Quick Start Guide – PLACE CONTROL MEASURES ON A MAP (3 OF 4)



To place a control measure on the map first name it and assign it to a previously selected unit. These steps are performed in the **Required Tab** located at the bottom of the **Control Measure Palette.**

Name the **Control Measure.**

Left-click on the desired unit.

Place the cursor on the map and left-click all points included in the **Control Measure.** Numbered points will appear on the map, with corresponding grid locations appearing in the **Locations** section of the **Control Measure Palette.** Once complete left-click **Create.**

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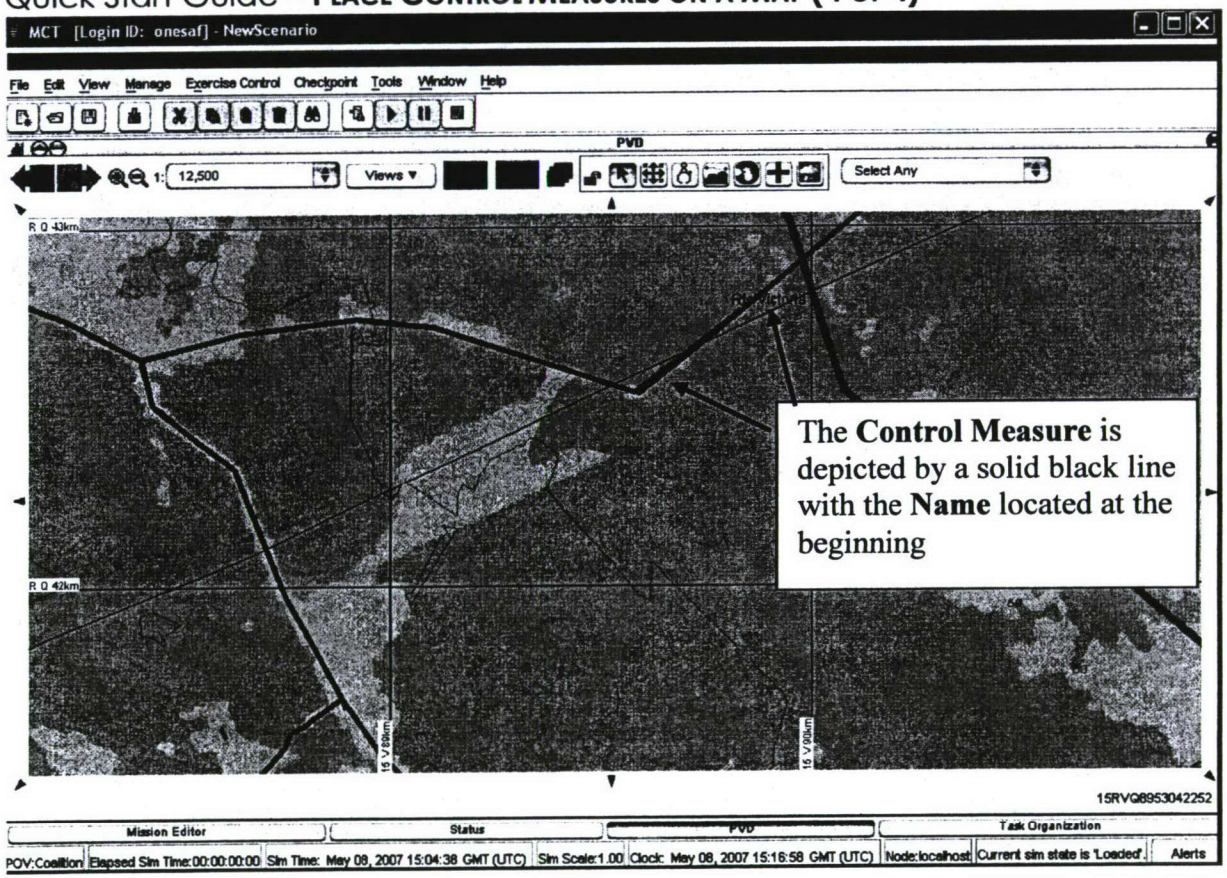
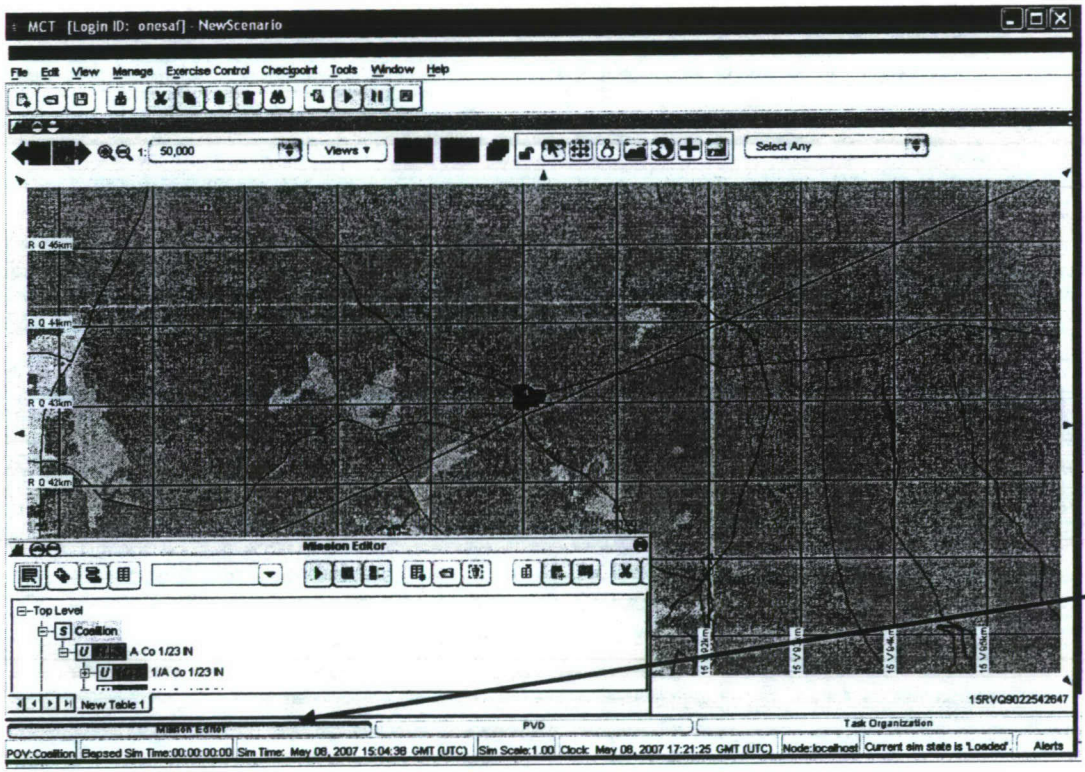
OOS Quick Start Guide – **PLACE CONTROL MEASURES ON A MAP (4 OF 4)**



25

OOS Quick Start Guide – **ASSIGN MISSIONS TO ENTITIES AND Units (1 of 6)**



Assigning missions to a Unit/Entity is done in the **Mission Editor** window.

Left-click on the **Mission Editor Tab** to view the window.

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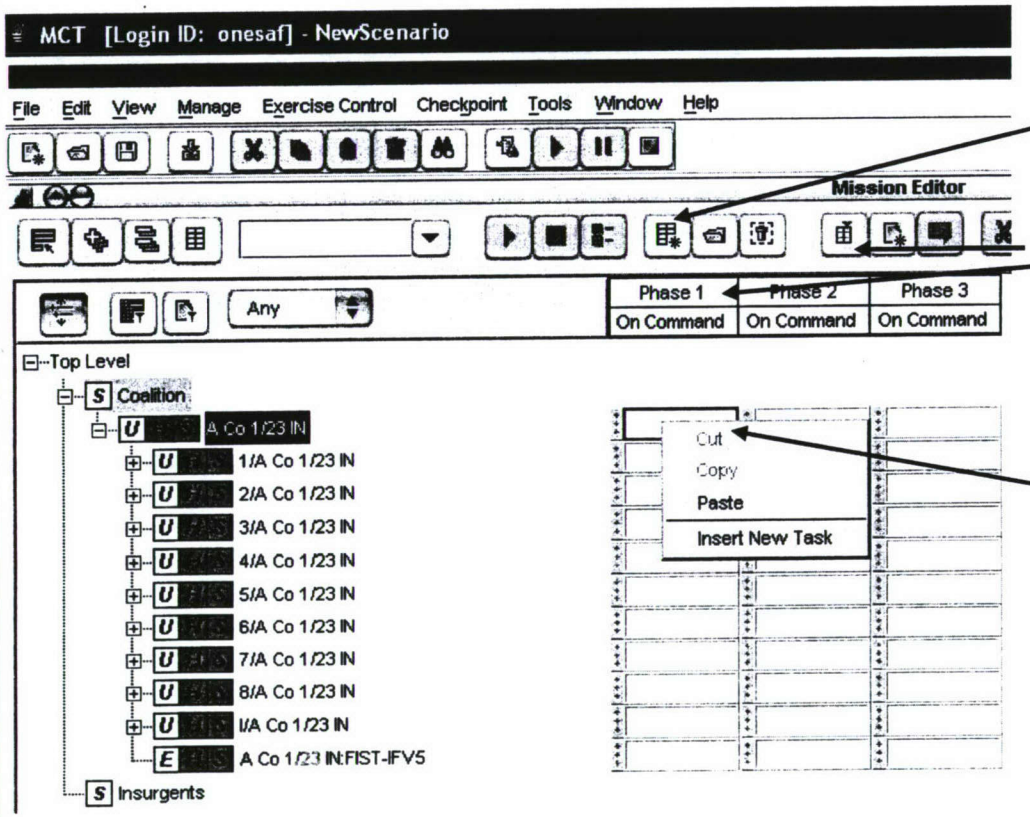
OOS Quick Start Guide – **ASSIGN MISSIONS TO ENTITIES AND Units (2 of 6)**



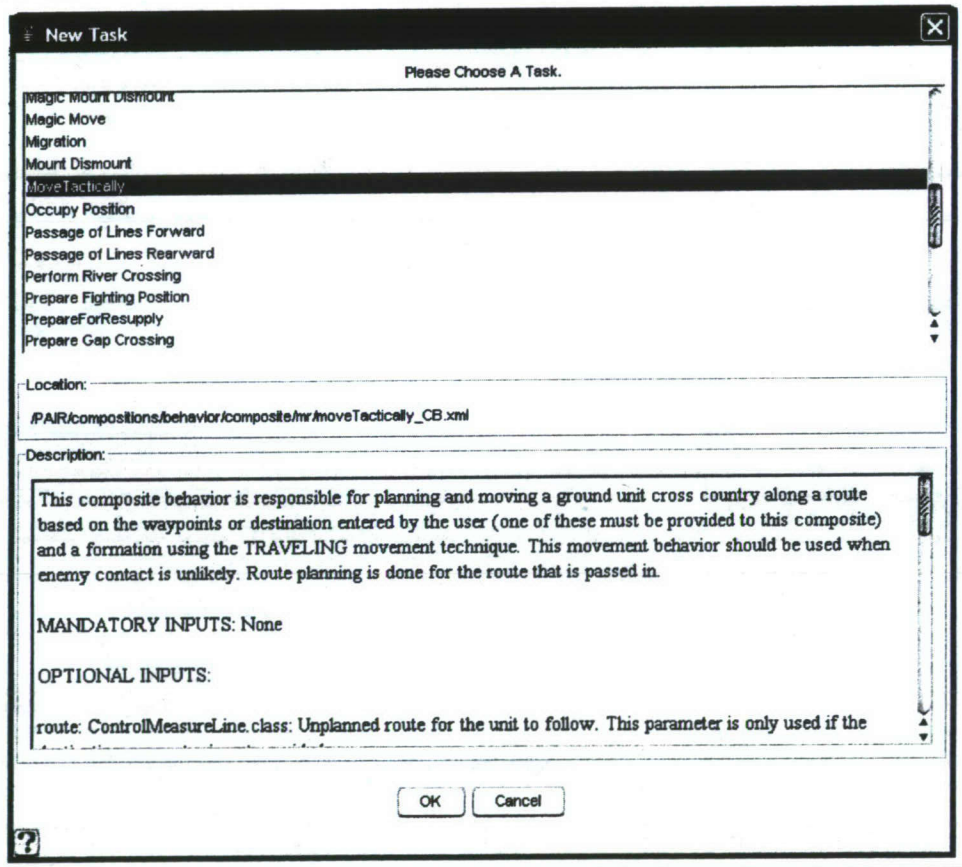
If nothing is visible left-click the **New Mission Table** icon to insert a new table.

To assign a behavior/mission to a unit/entity first left-click to add a new phase.

Right-click inside a **Phase Cell**, mouse over **Insert New Task** and left-click once.

27

OOS Quick Start Guide – **Assign Missions to Entities and Units (3 of 6)**



Scroll down to the appropriate behavior/mission and left-click on the mission to highlight it. A brief description of the behavior along with mandatory and optional inputs is displayed in the **Description** window

Left-click **OK**

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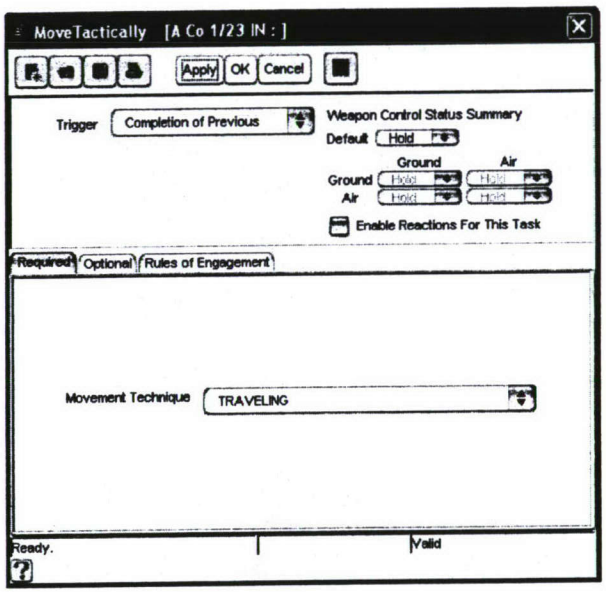
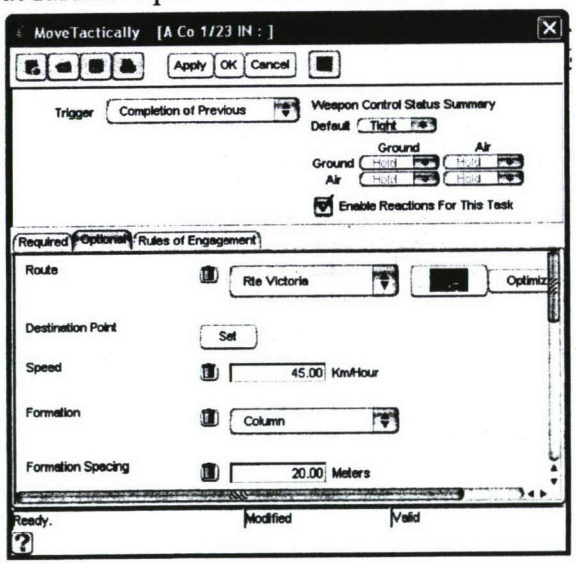
OOS Quick Start Guide – **ASSIGN MISSIONS TO ENTITIES AND Units (4 of 6)**



The first tab is the **Required Input** tab. Each section of this tab must be filled in to execute the mission. The **Trigger** can be assigned at this time. **Completion of Previous** is the preferred method. This trigger will allow the scenario to continue from behavior to behavior and phase to phase without further input from the user.



The second tab is the **Optional Tab.** In this particular case it allows the user to input the **Route, Speed, Formation** etc. The user will select **Weapons Control Status, and Enable Reactions** at this time.

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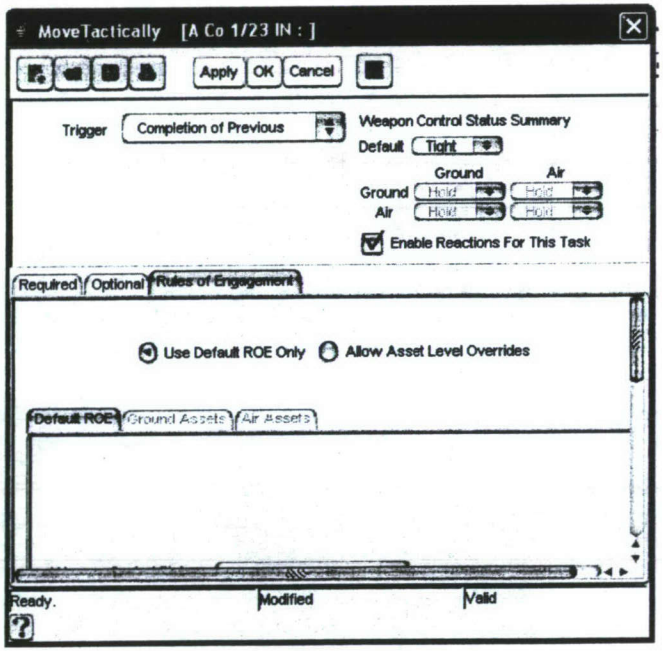
OOS Quick Start Guide – **ASSIGN MISSIONS TO ENTITIES AND Units (5 of 6)**



The third tab is the **Rules of Engagement Tab.** This allows the user to set the ROE for each side. The **Default ROE** is based on the doctrine selected for each side/force

Upon completion of User choices left-click on **Apply,** then left-click **OK.**

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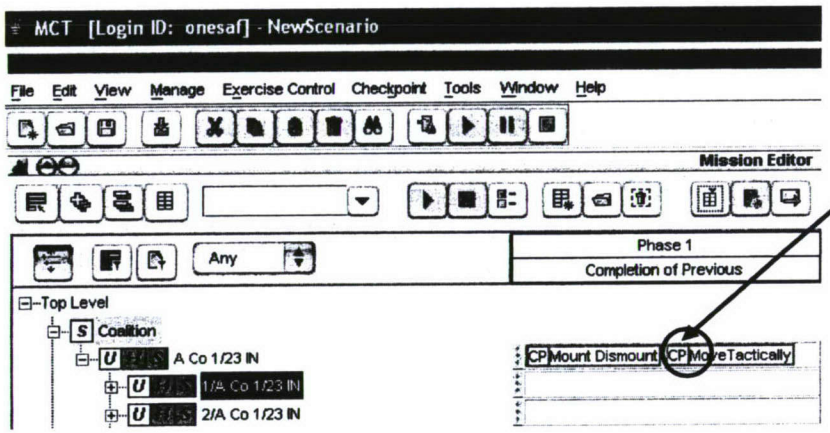
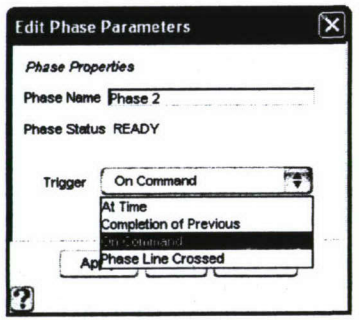
OOS Quick Start Guide – **ASSIGN MISSIONS TO ENTITIES AND Units (6 of 6)**



More than one mission/behavior can be assigned to each cell. The second or third mission/behavior will execute in sequence upon completion of the first **(CP = Completion of Previous)**



Each **Phase** must be assigned a **Trigger**. Right-click each **Phase,** mouse over **Edit Parameters** and use the **Trigger** drop down menu to access choices:

At Time – a specified simulation time
Completion of Previous – at the end of a phase or behavior
On Command – user input is required
Phase Line Crossed – phase line graphical control measure required

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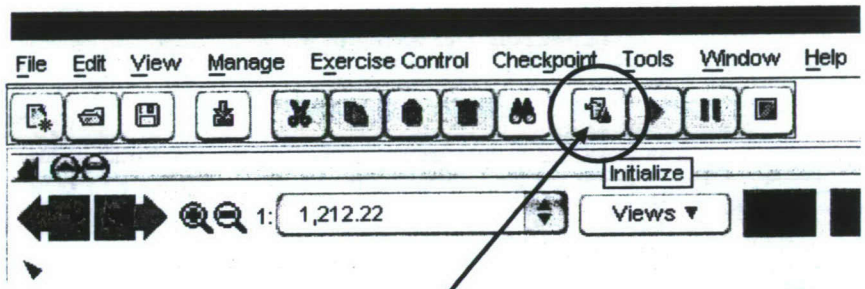
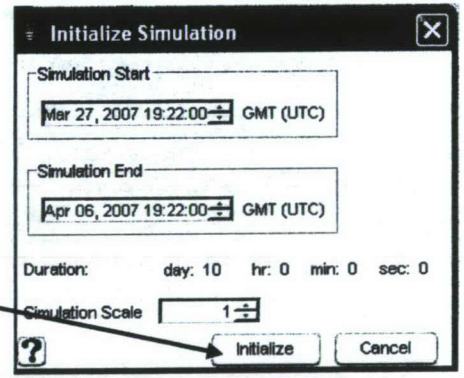
OOS Quick Start Guide – **RUN A SCENARIO (1 OF 2)**

WARNING: Before initializing any scenario ensure that the scenario is saved.



Initialize the scenario by left-clicking the [ ] icon.

Left-click the **Initialize** button again on the Pop-up window



The system will show that the scenario is initializing in the lower right corner of the screen

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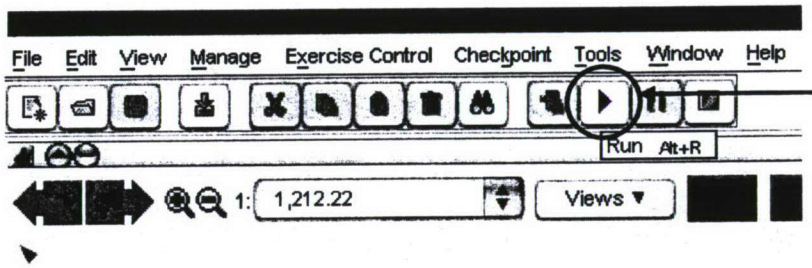
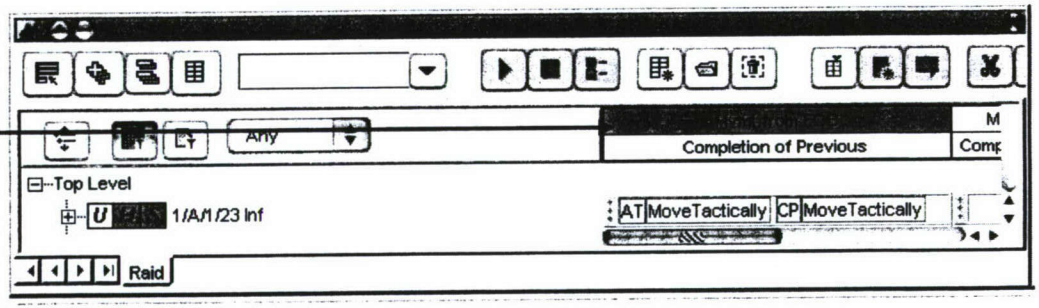
OOS Quick Start Guide – **RUN A SCENARIO (2 OF 2)**



Run the scenario by left-clicking the ▶ icon

In the **Mission Editor** the first **Phase** will turn green when executing the phase.



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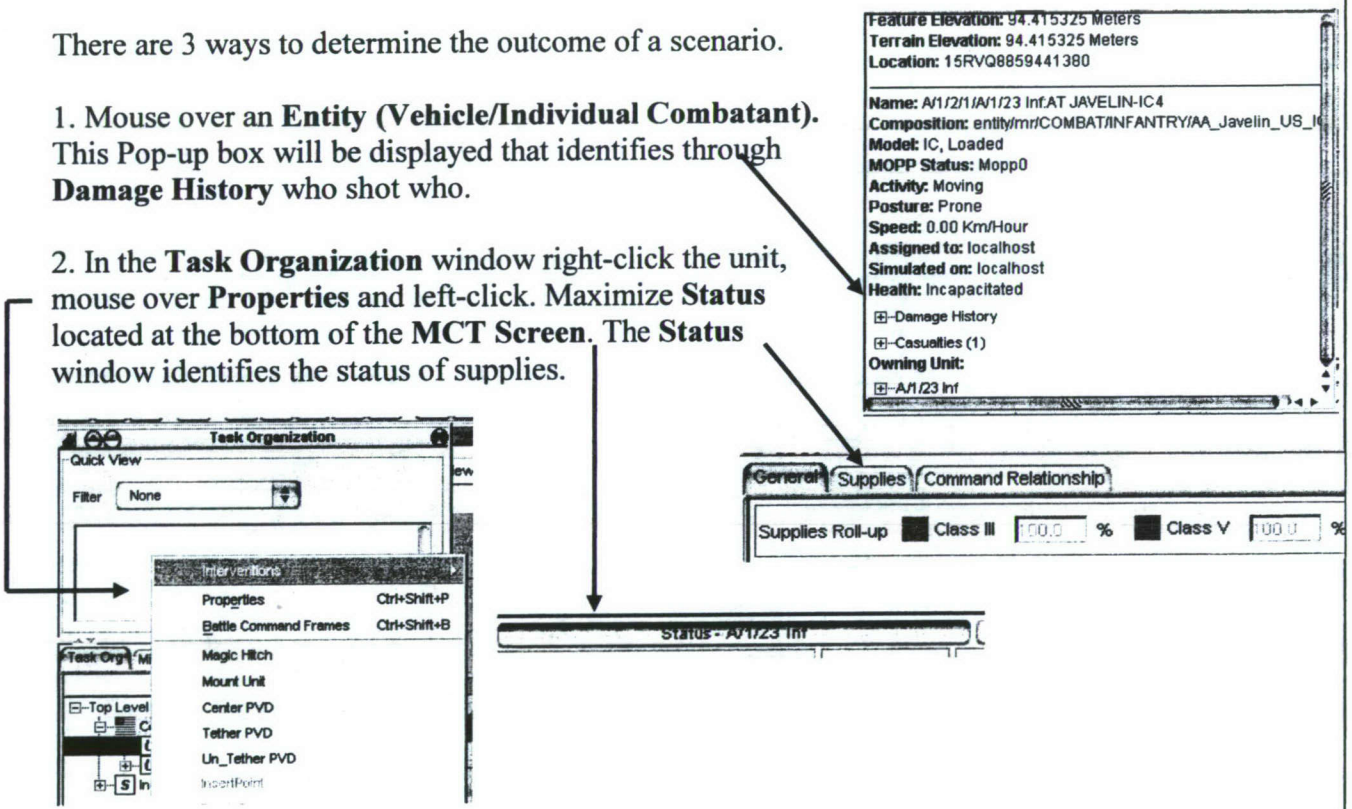
OOS Quick Start Guide – **DETERMINE OUTCOME OF SCENARIO (1 OF 2)**

There are 3 ways to determine the outcome of a scenario.

1. Mouse over an **Entity (Vehicle/Individual Combatant).** This Pop-up box will be displayed that identifies through **Damage History** who shot who.

2. In the **Task Organization** window right-click the unit, mouse over **Properties** and left-click. Maximize **Status** located at the bottom of the **MCT Screen**. The **Status** window identifies the status of supplies.



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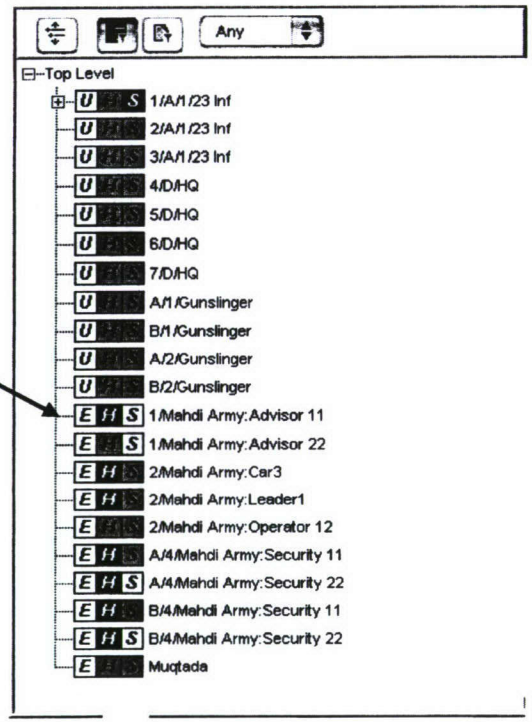
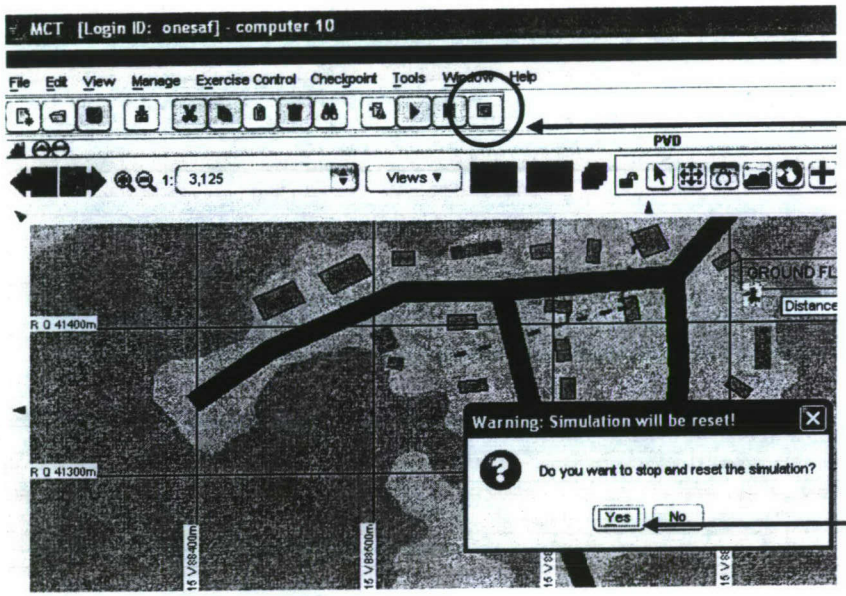
OOS Quick Start Guide – **DETERMINE OUTCOME OF SCENARIO (2 OF 2)**

3. Maximize the **Mission Editor** window. The status of each **Entity/Unit's Health (H) and Supplies (S)** is determined by the current color of the **H and S.**



35

OOS Quick Start Guide – STOPPING AND RELOADING A SCENARIO (1 OF 2)



Left-click the **Stop** button.

Left-click **Yes** in the pop-up window.

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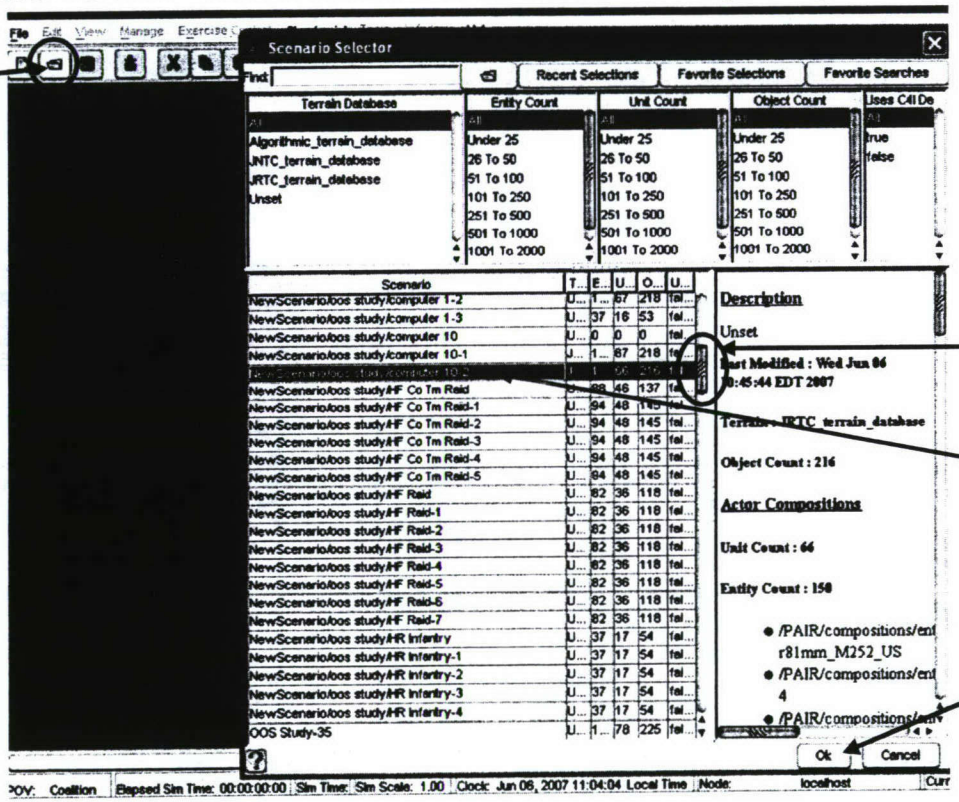
OOS Quick Start Guide – **STOPPING AND RELOADING A SCENARIO (2 OF 2)**

Left-click to open saved scenario



Scroll down the **Scenario Selector** window until you find your scenario.

Left-click to highlight the scenario.

Left-click **OK** in the lower right hand corner

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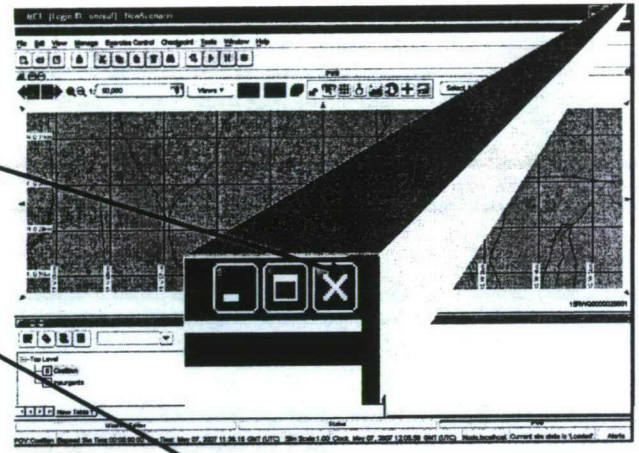
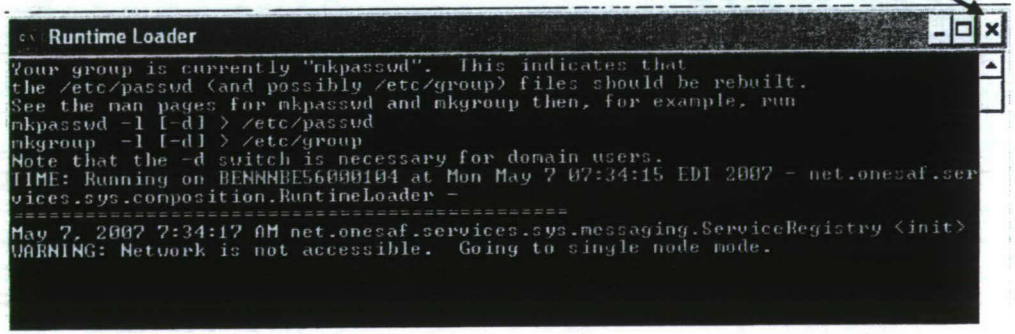
OOS Quick Start Guide – **SHUT DOWN PROCEDURES**

Left-click the **"close"** button in the upper right hand corner of the **MCT** screen

Left-click the **"close"** button in the upper right hand corner of the **Runtime Loader** Screen





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Notes