Training Technology Update

What's new for commanders and training Marines

by Maj Brian M. Kibel

This article will provide an overview of the training simulation systems available for use by commanders to train their Marines. Ranges, ammunition, resources, and time are at a premium to meet the training requirements. In order to adequately meet these expanding and exceedingly complex training requirements, the Marine Corps will become more and more reliant on realistic and effective simulations. Training modeling and simulation (M&S) serves as one of many tools for commanders to support training of their Marines for combat. Many of the systems described support training to *Training and Readiness Manual* standards.

Marine Air-Ground Task Force (MAGTF) Training Simulations Division (MTSD), Training and Education Command (TECom) identifies, develops, and coordinates the integration of modeling and simulation requirements and sponsors ground virtual and constructive training simulations in order to provide accredited training systems to the total force. MTSD's tasks include:

- Lead and coordinate documentation for ground training M&S requirements development and doctrine, organization, training, material, leadership and education, personnel, and facilities integration (DOTMLPF) for Marine Corps virtual and constructive training capabilities.
- Program of record/project sponsorship of ground nonstandard virtual and constructive training capabilities.
- Support/Represent Commanding General, TECom, in his role as advocate/community lead for Marine Corps training M&S.

The Program Manager, Training Systems (PMTraSys), is the Marine Corps Systems Command's independent program manager assigned the responsibility to provide training support services and development, delivery, and life cycle sustainment of training systems and devices. PMTraSys and MTSD work together to ensure that the best possible solutions are provided to meet the Marine Corps' training simulation needs.

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Current Capabilities

Minor training devices. This program is an acquisition program that enables the Marine Corps to procure training devices not covered by formal acquisition programs or a program of record. These range from simple rubber weapons to systems as sophisticated as shock trauma simulators.

Indoor Simulated Marksmanship Trainer (ISMT). The ISMT is fielded in two variants, the ISMT-Enhanced (ISMT-E) and the ISMT-Marine Security Guard (ISMT-MSG). The ISMT-E is designed to provide marksmanship, weapons employment, crew served, collective, indirect fire, and tactical decision-making training for individual and crew-served weapons. It consists of an instructor station, the audiovisual system, and five weapons firing positions. The ISMT-MSG is a portable version of the ISMT-E developed to train weapons skills with the M9 pistol, the M4A1 Service rifle, and the M870 shotgun. It provides Marines the opportunity to train on qualification courses of fire, field firing, and judgmental shooting situational training. Latest improvements to the ISMT include the implementation of wireless technology (Bluefire™) to provide weapon recoil, eliminating the need for a tether and allowing for greater freedom of movement.

Deployable Virtual Training Environment (DVTE). DVTE is a collection of tools specifically designed to train Marines, from the individual to the battalion staff, using a simulation network with reconfigurable workstations capable of emulating a vast array of training scenarios. The following is a list of the current training simulation applications on the DVTE suite:

- Virtual Battlespace 2 (VBS2). VBS2 is a personal computer (PC)-

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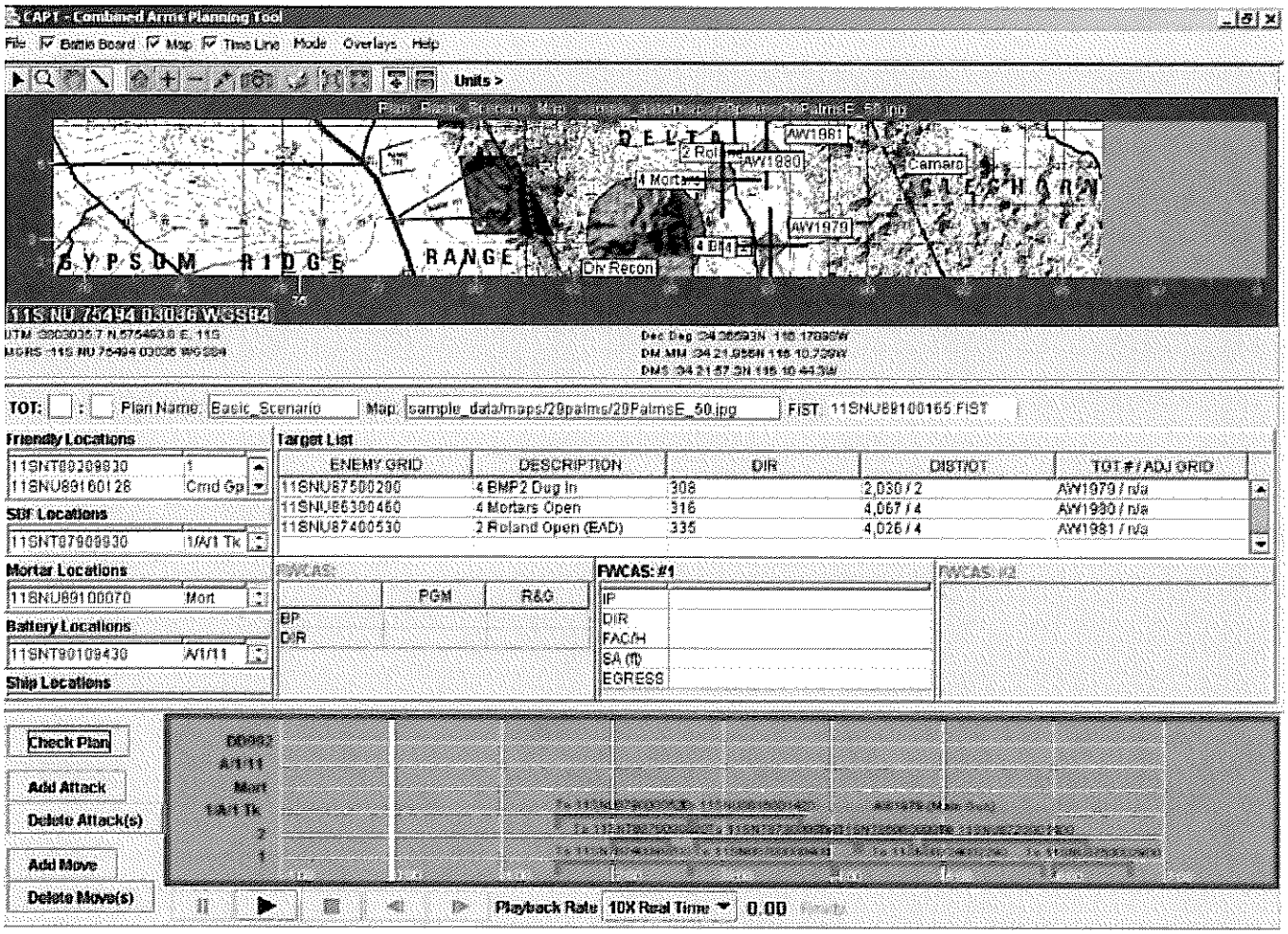
based linked "first person" virtual battlefield. The DVTE suite of 32 linked laptop computers allows up to a platoon-sized unit to train together against a virtual opposing force. The unit can train in a number of environments, with the scenario and level of opposition being tailored to meet the unit's requirements. The primary use is establishing and practicing communications procedures and coordination, along with basic tactics, techniques, and procedures for maneuver. VBS2 can also be used to help train small unit leaders in mission planning, preparation, and briefing from the fire team level to company battle planning and mission rehearsal. VBS2 provides an outstanding after-action review capability, which allows the unit leader the ability to review and modify his plan and reorganize his unit to meet the mission specificity. The latest addition to VBS2 is the fires model that allows units to train fire support teams (FiSTs), forward air controllers (FACs), and forward observers.

• Combined arms network (CAN). CAN is a PC-based, first person perspective, stand-alone artillery call for fire simulator that is designed to allow Marines of all skill levels to develop and practice their call for fire skills on a variety of targets (both stationary and mobile). ObserverSim can provide doctrinal feedback on fire missions and help novice users correct errors. The user settings can be easily adjusted to create more challenging missions. An important addition to the CAN arsenal has been the inclusion of a head-mounted display (HMD) unit for FAC training. HMDs have an inertial tracking device that automatically tilts and pans the terrain display based on user head movement.

• Combined arms planning tool (CAPT). CAPT is a computer-based user input tool to develop a quick fire plan that evaluates fire plans-based guidelines developed by MAGTF Training Command's Tactical Training Exercise Control Group. It pro-



A screen shot of the CAPT. It trains FiST leaders in fires planning and execution. *(Courtesy of the author.)*

vides a means to train the company FiST leader to understand planning and execution of company-level fire support while providing the opportunity to practice using a virtual battle board.

• Tactical language training system (TLTS). TLTS is a PC-based, standalone trainer designed to allow an individual to develop proficiency with the Iraqi, Dari, Pashto, and French languages. It provides a mixture of skill building lessons and practice scenarios that the students utilize to engage and converse with the local population. It is intended for all skill levels and uses voice recognition systems to enable speaking practice.

• Automated language training system (ALTS). ALTS is a first person conversational artificial intelligence plug-in for VBS2. This new training tool allows trainees to practice the tactical Iraqi language and cultural skills in multiplayer training scenarios. In the current scenario, trainees must meet with a local sheikh and speak with him in Iraqi Arabic in order to obtain information about insurgents in the area. Other languages will be addressed in future builds.

• Recognition of combatants (ROC). The ROC suite allows the individual user to move through a self-paced program that provides instruction on identification and recognition of friendly and threat weapons systems. The images can be presented as seen through thermal sights and other optics. ROC includes suicide bomber (SB) and improvised explosive device (IED) instructional applications (ROC-IED and ROC-SB). ROC-IED and ROC-SB not only cover visual recognition but also other factors associated with IED and SB tactics.

• MAGTF XXI. MAGTF XXI is a computer-based simulation trainer allowing Marine expeditionary unit (MEU) commander and staff perspectives to plan and execute typical MEU missions with a two-dimensional view of the battlefield. It provides charts and tracking information to determine the success of the battle plan as well as a recording of the exercise for later review.

• Close Combat Marines 6 (CCM). CCM is a realtime strategy simulation that can aid in teaching tactics at the squad, platoon, and company levels.

Virtual Combat Convoy Trainer-Marine (VCCT-M). VCCT-M is consid-

ered the first generation of convoy simulators. VCCT-M trains Marines in basic and advanced combat convoy skills using variable terrain and roads in a variety of environmental, visibility, and vehicle operational conditions. It is a mobile, self-contained, and self-supporting virtual simulation system. It consists of a HWMMV mockup, small arms and crew-served weapons, a 360-degree display system, and an after-action review system.

Combat Convoy Simulator (CCS). One of the latest additions to training simulation is the CCS. The CCS provides an immersive training environment for convoy operations. It is designed to provide training of the basic procedures for the vehicle driver, gunner, and passengers. This training includes, but is not limited to, weapons usage and target engagement, driver evasive action, IED countermeasures, and command and control (C^2) procedures within both the vehicle and the convoy. It also may provide a general familiarity with the terrain and environment. The CCS consists of six vehicle stations—four HMMWVs and two medium tactical vehicle replacements (MTVRs).

Combat Vehicle Training System (CVTS). The CVTS is used for individual, crew, section, and platoon training for M1A1 and Light Armored Vehicle 25 (LAV–25) crews. The advanced gunnery training system (AGTS) is used for the M1A1 and LAV–25. CVTS is composed of two configurations, institutional and deployable, and is used for sustainment training at the home base, on board ship, or at the deployed location. The AGTS can be used for gunnery proficiency, weapons platform familiarization, and tactical training.

Internal view of an MRAP MET (Technology Deployment Plan for the MET, U.S. Army Program Executive Office, Simulation Training and Instrumentation). *(Photo courtesy of the author.)*

The AAV (Assault Amphibious Vehicle)-Turret Trainer is the CVTS for the AAV–7. It is a stand-alone trainer that uses a surplus AAV turret and ISMT weapons (M2 and Mk19). The system consists of a gunner station, instructor-operator station, driver station, AAV computers, and simulation software. The turret trainer provides individual, crew, and section gunnery and tactical training; it also includes an after-action review capability

MAGTF Tactical Warfare Simulation (MTWS). MTWS has been the Marine Corps' premier aggregate-level simulation since 1995 providing state-of-the-art tactical command staff training for Marine expeditionary brigade (MEB) through Marine expeditionary force. Its modeling, breadth, and flexibility enable users to represent and exercise a wide variety of combat scenarios to prepare leaders to face current military challenges in today's world. MTWS is designed to support the training of commanders and their staffs in exercises involving live and simulated land, air, and naval forces at all operational command levels to include joint task forces.

The simulation incorporates the full spectrum of combat models including ground combat, air operations, fire support, amphibious operations, combat engineering, intelligence, and logistics all within one model. MTWS can also exchange data with operational C^2 systems, such as the global C^2 system and C^2PC, allowing Marines to train with real C^2 equipment. MTWS includes a robust after-action review capability providing a continuous historical and realtime visual interface to exercise data that allows analysts and observers to examine events during and after exercise conduct.

TECom is currently working with U.S. Joint Forces Command to include MTWS as a component within the joint live, virtual, and constructive training federation. This will allow the Marine Corps to use MTWS during joint-level training exercises as well as *Title 10* Service training. Completion of this effort is scheduled for fiscal year 2011 (FY11).

MTVR Operator Driving Simulator (MTVR-ODS). The ODS is a high-fidelity immersive technical skills trainer for teaching Marines how to safely drive select, commonly fielded tactical

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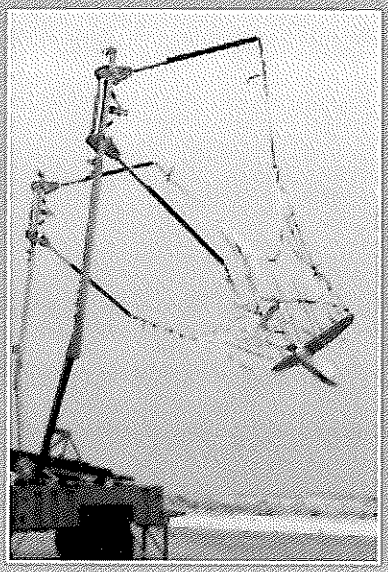

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wheeled vehicles (MTVR, HMMWV, mine-resistant armor-protected (MRAP) vehicle, Cougar CAT I and Buffalo CAT III variant). It is an interactive, reconfigurable training device that provides realistic haptic feedback to the student through the steering, wheel pedals, seat, and dashboard controls that replicate the experience of driving the actual selected vehicle. The ODS models the effects of wind, sandstorms, temperature, precipitation (fog, rain, and snow), traction, tire pressure, and road surfaces on the handling characteristics of the selected vehicle.

HMMWV Egress Assistance Trainer (HEAT). HEAT is a full-scale HMMWV mockup that can rotate 360 degrees to provide Marines with vehicle rollover experience and rehearse the steps necessary to survive a vehicle rollover. HEAT affords Marines the opportunity to gain experience of proper egress procedures, while reinforcing the importance of proper seatbelt/harness utilization, developing awareness of the necessary individual and crew skills needed to execute rollover procedures, and training tactical perimeter security drills.

Modular Amphibious Egress Trainer (MAET). The MAET is an underwater escape trainer with a generic fuselage section representing specific aircraft and amphibious vehicle cockpit and cabin emergency escape exits. Training provides shallow water and underwater egress training. Trainees are able to practice escaping the trainer with the fuselage floating in an upright position, an inverted position, or any position between upright and inverted.

Shallow Water Egress Trainer (SWET). The SWET is a single-seat emergency egress trainer that has a specially designed frame fitted with buoyancy pods that allow it to be easily handled and inverted by instructors. The SWET can be used very effectively to conduct basic disorientation familiarization. It can be righted in less than 2 seconds without the trainer having to touch the trainee. This ensures optimum safety during training. The shape and weight distribution of the SWET is such that the instructor can easily invert and right the device with the student strapped in.

Submerged Vehicle Egress Trainer (SVET). SVET uses technology similar to the MAET to train egress from submerged ground vehicles, replicating the HMMWV and other tactical wheeled platforms.

Capabilities Soon To Be Fielded

Combined Arms Command and Control Training Upgrade System (CACCTUS). CACCTUS is an ongoing research and development program that when fielded in early FY10 will serve as a technology upgrade to the combined arms staff trainer, delivering two-dimensional and three-dimensional situational awareness information, scenario development tools, and after-action review capability. A CACCTUS installation will be capable of interacting with many current real-world C^2 systems, such as C^2PC and the advanced field artillery tactical data system.

Training provides shallow water and underwater egress training.

CACCTUS supports two main objectives. First, the system will serve as the principal combined arms staff training system for battalion up to MEB staffs to conduct combined arms coordination in a distributed fashion utilizing state-of-the art technology to improve training efficiency. Second, the system, at final operational capability, will provide the means to link to live instrumented training data with virtual and constructive simulation data into a common operational picture to conduct large-scale combined arms training for large training audiences operating in both live and synthetic training environments.

Supporting Arms Virtual Trainer (SAVT). The SAVT is a fixed site, partial dome (240- x 60-degree) system that provides an immersive mission-based training environment for students training in the application of combined arms (both calls for fire and close air support). SAVT is jointly accredited and can be used to replace 33 percent of live fire events in support of currency training for Types I and II close air support controls.

MRAP Egress Trainer (MET). MET uses the same technologies as the HEAT system to train rollover and egress procedures from newer MRAP vehicle cabs built into a special frame that it integrated on a cradle/spinner module. The MET cabs are designed and built with the highest fidelity to replicate the interior compartments of actual MRAP vehicles. It is due to be fielded from late summer 2009 through summer 2010.

Conclusion

This article has presented a short description of current and soon to be fielded ground training simulation capabilities. These capabilities are designed to provide a fast and efficient means to repeat training tasks under realistic conditions to reinforce skills. They can also enable training that cannot be done in a live environment because it is either not feasible or too dangerous. These systems provide commanders with alternative means to meet training requirements.

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