



SOF: Leveraging Training Technology

Group editor Marty Kauchak reports that special operations forces in the US and other nations are investing in ever more capable technology to train, rehearse and maintain proficiency for their missions

equirements across US Special Operations Command's (USSOCOM) learning portfolio for training and education are being harmonized to the rapidly evolving contemporary operating environment. As this article was prepared for publication individuals, units and staffs from USSO-COM and its component commands (Air Force, Army, Marine Corps, Navy and Joint Special Operations) were supporting missions around the globe, from hostilities in the Middle East to nationto-nation engagement and training exercises, including the annual Flintlock exercise in Chad.

A USSOCOM spokesperson speaking on a condition of anonymity told the author this May 29 the command must be prepared for unprecedented challenges in an uncertain, dynamic, and everevolving operating environment filled with agile and rapidly adapting adversaries. Accordingly, training and education figure prominently in the command's 2015 readiness strategies. "Responding in this complex environment requires that USSOCOM remains focused on providing professionally trained, culturally astute, language capable, and situationally adaptable forces capable of executing the full range of Special Operations Forces (SOF) activities. Our primary focus continues to be the development of adaptive and creative SOF leaders that effectively support persistent, networked and distributed Geographic Combatant Command operations."

On cue, the command spokesperson then pointed out modeling and simulation (M&S) remains a key enabler in the community. "M&S augments live training to improve tactical proficiency while reducing personnel tempo wherever possible. USSOCOM coordinates across the SOF enterprise to identify opportunities

to integrate and expand M&S in live, virtual, and constructive (LVC) domains to train, rehearse, and maintain proficiency in SOF tasks and missions."

Similarly, SOF units in other nations are also investing in technologies for training.

New Training Systems

As part of US SOF efforts to integrate and expand M&S in the LVC environment, the services' special force components are taking delivery of new training devices and systems. This development is most evident in the air domain, with Air Force Special Operations Command (AFSOC) recapitalizing its air weapons platforms – driving the demand for new training systems and programs.

In December 2014 the first AFSOC MC-130J Commando II arrived in the Pacific at Kadena Air Base, Japan, another waypoint on the service component's

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USSOCOM's primary focus is the development of adaptive and creative SOF leaders, including these Marines with 1st Marines Special Operations Support Battalion, that effectively support persistent, networked and distributed Geographic Combatant Command operations. Image credit: Sgt. Donovan Lee/US Marine Corps. roadmap to retire 57 of the component's venerable MC-130 E, H and P models.

Another new AFSOC aircraft, the HC-130J, is replacing HC-130P/Ns as the only dedicated fixed-wing Personnel Recovery platform in the Air Force inventory.

Managed by a small Lockheed Martin team in Marietta, Georgia, the C-130J MATS program is well into the delivery of the AFSOC C-130J training system.

In 2011, AFSOC initiated the standup of initial C-130J training with the award of the first HC/MC-130J weapon system trainer (WST). Jim Weitzel, vice president for Training Solutions for Lockheed Martin's Training and Logistics Solutions, pointed out that since then the component has been expanding its training system complement by adding more pilot, loadmaster and maintenance training devices. "In 2012, six additional WSTs, three Enhanced Integrated Cockpit Systems Trainers, one Loadmaster Fuselage Trainer and six Loadmaster Part-task Trainers were added to the procurement. Training device deliveries began in 2013 continuing to present day. To date, all devices except two have been delivered and are in training operations at Kirtland AFB (Air Force Base), Davis-Monthan AFB and Cannon AFB. The remaining devices, WST#6 and WST#7, are slated to deliver to Hurlburt Field in December 2015 and Moody AFB in February 2016 respectively."

The military-industry team has raised C-130 training for the Air Force special forces aviation community to a new level – allowing its crews to train as they will operate in the new C-130 family of SOF-configured aircraft rapidly entering service.

In one instance, the C-130J trainers address the new glass cockpit design, a marked change from legacy C-130 cockpits. Weitzel further added the HC and MC variants add special sensor suites and a combat systems operator station to the flight deck. "The training device simulation elements use latest technologies to provide as close to real-world training as possible to support advanced, realistic mission rehearsal type training to prepare those who will go into harm's way."

Lockheed Martin has assembled team of high profile industry members to support the AFSOC C-130 training program. The C-130 Original Equipment Manufacturer's industry partners include CAE, FSI and Vencore.

Lockheed Martin is the prime integrator for the entire training system consisting of a variety of training devices and training material. Weitzel continued, "Lockheed Martin provides all elements of program management including requirements allocation; integration and test; system performance; and customer sell off. Lockheed Martin also developed and provides the Multifunction Training Aid to support cockpit and mission computer interface familiarization training."

CAE manufactures the baseline devices and maintains operating software.

FSI provides the Vital visual system and associated visual databases.

Vencore supplies the cockpit recording and debriefing systems for the WSTs. Elsewhere on AFSOC's readiness



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horizon, the component plans to procure 37 Lockheed Martin AC-130J aircraft to recapitalize its AC-130H/U/W fleets by FY 2025. One AC-130J has been delivered and a second AC-130J aircraft was scheduled for delivery as this issue was published.

The AC-130J program takes a USAF funded MC-130J aircraft and then modifies it with a USSOCOM procured precision strike package.

Further, Bell-Boeing has delivered 46 of a planned buy of 52 CV-22 Ospreys. All remaining aircraft are on contract with final delivery anticipated for December 2016. The delivery of 52 aircraft reflects the reality of congressional funding to replace two aircraft lost in combat and training in 2010 and 2012 respectively.

An AFSOC spokesperson was asked to highlight how aircrew training for the fielded CV-22 and new AC-130J may evolve in the next 12-24 months. The spokesperson replied future changes in the 12-24 month period will include growth in complex distributive mission operations training managed by AFSOC's Readiness Training Center. "It will involve multiple aircraft simulators and ground JTAC simulators conducting Weapons Instructor Course tacticians-supervised, virtual full mission profile (vFMP) of 1st Special Operations Group and 27th Special Operations Group aircrews. They will use complex scenarios intended to accelerate the advancement of AFSOC aircrews. The requirement is to increase up to eight vFMPs per month."

More significant, is AFSOC's plan to increase the amount of training in its flight training devices. Indeed, during the recent ten-year period AFSOC has moved from about 35 percent of qualification/mission training in simulators, to about 80 percent





"with plans to move higher." The command spokesperson added, "Continuation training has moved from 0 percent to 30 to 40 percent. In the past, simulator fidelity standards and not having simulators at all operating bases have limited this transition. AFSOC is increasing crew proficiency and combat capability through the availability of high-fidelity simulation."

Back on the Ground

This author has watched the growth and expansion of Marathon Targets through the last seven years, from an Australian entity supporting home nation defense forces to one that delivers systems around the globe to diverse military and security forces. Of special interest, Marathon's "smart targets" are currently used by SOF on three continents. They have been in active use by Australian Special Forces since 2008. Two UAE SOF groups are also users, as is an unspecified "North American SOF group". Ralph Petroff, president-North America, of Marathon Targets, further reported that multiple US SOF groups have shot at these autonomous robotic targets on a variety of US and foreign facilities.

Asked about his SOF customers' requirements for his product line, Petroff pointed out smart targets solve a problem common to all militaries and SOF – currently, the only time ground operators conduct live-fire training on This 58th Special Operations Wing HC/MC-130 weapon system trainer provides a realistic simulation of aircraft flight characteristics to train special operations and rescue aircrews in a wide variety of flight conditions. Image credit: Lt. Col. Alex Carothers/ US Air Force. realistic moving targets is during actual firefights. "Everyone has identified this as a capability gap – some call it a capability 'chasm.' Autonomous robotic targets that look, move, and behave like real people, significantly improve moving marksmanship. Recent studies by both the US Marine Corps and US Army have documented significant improvement in marksmanship after only a few days," he added.

Petroff was asked about the return on investment (ROI) on his smart targets for SOF audiences. The industry executive responded "Smart targets have a strong financial ROI. They are far less expensive than building a new moving targets range and quicker too - because any current outdoor or indoor live fire range can be turned into a state-of-the art moving target range in a day." Because one operator can handle 20-plus autonomous robots, the sustainability and life cycle costs are also lower than conventional movers. He continued, "But the far bigger payback is in SOF who have significantly improved marksmanship, and who have experienced realistic live fire training scenarios that require split-second life-or-death combat decision-making skills. They become more lethal - but also more discriminating, and more confident. The constant presence of robotic 'civilians' in these exercises inevitably leads to reduced civilian casualties. The end users tell us these combat scenarios are the real game-changers."

The business model and technology foundation for Marathon's products continue to evolve, driven in part, by frequent requests for a few weeks of training with the robotic targets. In response to this demand, Marathon deploys robot rental fleets in the US and Europe. "We provide the robots, a multi-purpose trailer, and trained operator. Our operator works closely with the training instructors to immediately translate their training objectives into software scenarios the robots can execute on the spot," Petroff observed and continued, "Every year our smart targets get smarter. The robots' ever-increasing Artificial Intelligence enables human-like behaviors, both on the individual and group level. For example, a group of robotic targets can stage a coordinated attack on a firing position with minimal operator input. The aggressiveness of the attack is adjusted in real-time, either via user input or automatically when some of the targets are hit. As a result, the targets may conduct an orderly withdrawal - or a panicked retreat."

Laser Shot, another company in the ground training sector, has firearm simulator systems and live-fire training facilities which help SOF around the globe advance through their marksmanship learning continua. The company's products allow individuals and units to engage virtual imagery with live fire. Sim-Range™ provides a glimpse of how Laser Shot products support marksmanship training. The product further illustrates what else is new in the marksmanship sector.

SimRange is intended to simulate a traditional shooting range but with the use of virtual targets. Patrick Pongracz, a marketing specialist at Laser Shot, said "The SimRange is scalable and can be delivered in multiples of three lanes per screen allowing for expansion to meet your throughput requirements. Courseware will replicate actual training and qualification standards and built-in editors allow the end user to easily author their own content."



Pongracz further compared this new product to legacy virtual marksmanship systems. In the past, most firearms simulators required installing an independent laser hit detection camera adjacent to the projector requiring careful positioning and calibration. "If you had a portable firearms simulator this meant you had to perform this task every time you set up and took down for training," he recalled, and added, "The SimRange by Laser Shot solves that problem by integrating the laser hit detection camera inside the projector ensuring that it is always properly aligned and ready to go when you set it up."

Another feature upgrade is the ability to place it within 18-inches of a screen or wall due to its ultra-short throw technology. "This allows smaller rooms or spaces to now be converted into virtual ranges for safe, effective training without the need for ballistic facilities, or live weapons or ammunition," he emphasized.

Alerting Industry

USSOCOM's spokesperson concluded that SOF training systems should be standardized, interoperable, and reusable to the maximum extent (within the SOF enterprise and US Department of Defense). The command spokesperson concluded, "Our M&S systems should rely on open, common, and enduring standards and allow great flexibility to tailor for specific training needs, skills and environments." mst Marathon's 'smart targets' are currently used by SOF on three continents. Image credit: Marathon Targets.