January 2010

Eyes Beyond the Horizon

UNMANNED AIRCRAFT SYSTEMS PROJECT OFFICE

The Warfighter's Force Multiplier

"It is to our Warfighter that we proudly dedicate this publication."

The Future of UAS

COL Gregory B. Gonzalez,
Project Manager, Unmanned Aircraft Systems

Just a few weeks ago I returned from Afghanistan where I went to assess the status of the Unmanned Aircraft Systems (UAS) Forward Repair Activity and to gain feedback and insights from Soldiers and contractors operating and maintaining our unmanned aircraft in remote and austere Forward Operating Bases and Combat Outposts throughout that country.

I could not be more proud of our young UAS Soldiers/operators, support contractors, and their leaders. I observed them laboring tirelessly, day and night, to defeat the aggressive insurgent activity underway in the cavernous valleys and lofty peaks of the Afghan mountains.

Our Army's rich history is replete with stories of Soldiers and citizens who used innovation and imagination to find the enemy, and warn others of their presence. Today's UAS operators have taken their rightful place alongside Paul Revere, who provided early warning of attacking British Soldiers during the Revolutionary War, of Apache Scouts who aided U.S. Cavalry to track the Apaches during the Indian Wars, and long range recon units that identified targets deep in enemy territory. Today's UAS operators not only find and fix the enemy with the latest sensor technologies, but they also finish off the enemy with select, armed UAS.

It's not just the UAS operators whose skill and dedication paved the way for successful UAS operations on today's battlefields. I also observed staffs at the battalion, brigade, and division levels that have learned the value of unmanned aircraft and have successfully integrated them into the fight. Successful employment of unmanned aircraft requires the cooperation of many staff elements (staff weather officers, collection managers, intelligence officers, battle captains, etc.) who know what information needs to be collected, who know UAS capabilities and who developed the procedures to integrate UAS into the overall collection plan. The staffs I observed understand the utility of UAS and are finding new ways to take advantage of their capabilities.

At UAS Project Office (PO) we dedicate ourselves daily to give these Warfighters the most reliable, most capable UAS using the world's greatest technologies. In the pages that follow we highlight many of those new capabilities that we will field or provide as system upgrades over the next year to improve our UAS fleet. Although our systems are the best in the world, we can never settle for being the best today. Tomorrow always reminds us that we must push ourselves to keep ahead of our enemies who are doing all they can to close the gap.

While one eye must always focus on the present, UAS PO is also gazing into the future. We are investigating potential applications for UAS technologies not currently in our inventory. We are developing bidirectional remote video terminals to give Soldiers on the ground the capability to control UAS payloads flying above. We are investigating promising technologies for UAS resupply, we are searching for new technologies that will assist operators with simultaneously tracking multiple targets with a single payload and we are developing and expanding our capabilities for manned/unmanned teaming, which we view as the greatest potential for military application of UAS capabilities.

It is with the future in mind that the Army will soon release an Army UAS Roadmap. Although the Army UAS Center of Excellence leads the roadmap development effort, they are supported by UAS PO and TRADOC Capabilities Manager UAS and we are all cooperating in that effort. This document will formalize and focus our future efforts so that we provide our Warfighters with all they need to fight and win our nation's conflicts and keep themselves out of harm's way.

And so it is to our young, energetic, and bright Warfighters that we proudly dedicate this publication. We will do all we can to give you the right equipment, help you sustain it, and improve it so that you stay one step ahead of the enemy.

I hope you enjoy this edition of "Eyes Beyond the Horizon!"

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Eyes Beyond the Horizon

Mr. Tim Owings
Deputy Project Manager, Unmanned Aircraft Systems

COL Greg Gonzalez and I are truly fortunate to be in the positions that we are in. One of the advantages is that we get to witness all the many accomplishments on a daily basis. It truly is amazing. Two simple charts cross our desks every week. The first is the worldwide readiness chart and the second is the flight hours situation report. The system readiness across all our systems has been consistently above 95 percent while at the same time, we are closing in on ONE MILLION flight hours. These results were achieved while continuing to evolve, improve, and adapt our systems to the ever changing environment of two simultaneous theaters. These accomplishments were the result of the hard work of a lot of people. Our TRADOC Capabilities Manager (TCM), the Unmanned Aircraft System (UAS) Training Base, outstanding prime contractors, and the UAS Project Office (PO) all played vital roles. However, most of the innovation and great ideas were first surfaced by the Warfighters that use our systems every day in some of the harshest conditions on the planet. A question that we constantly ask ourselves is simply, "Are we positioning ourselves today to deliver even greater accomplishments tomorrow?" Our Warfighter deserves the absolute best that we can deliver and we must be positioned for a changing environment just as the Warfighter must be positioned for a changing battlefield. For that reason I chose the name of our magazine as the title of my article for this edition. I am going to briefly discuss just a few things that are occurring across the community as we focus beyond the horizon.

Three primary organizations service the Unmanned System community. The TCM defines the requirements, the Army Center of Excellence (CoE) sets the strategy, and the UAS PO delivers the equipment required to support both the requirements and the strategy. Each of us is continuing to define the future of UAS within our respective roles.

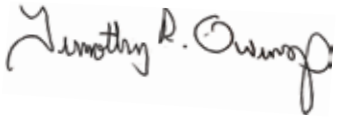
First, our TCM is focused on the next generation of capabilities from a requirements perspective. Currently three major requirements documents are being staffed. The first defines the next generation of small UAS requirements as a family of capabilities as opposed to a singular solution. UAS PO will field a proof on concept variant of this capability in 2010. The second requirement is for an improved Shadow® system. The document includes requirements for a Heavy Fuel Engine, greater endurance, and multiple payloads. UAS PO will field a limited set of improvements focused on this new requirement in 2010 as well. Finally, the requirements document establishing our One System® Remote Video Terminal system as a limited control station in addition to a video receipt device is in final staffing as well.

> "Innovation and great ideas first surfaced by the Warfighters."

Concurrent with these requirement evolutions, the CoE will release the Army's Strategic Roadmap. This document is likely the most significant in Army UAS history as it sets the Army's strategic path through 2035.

Here at the UAS PO, we are working to insure that we can meet tomorrow's needs as well. A major focus for our office is improving the rapidity of new technology integration while simultaneously continuing our evolution towards complete system interoperability. We stood up two new organizational elements focused on this intent. The first is the creation of the UAS Technology Center. The center is a technology incubator for the development, assessment, and early integration of new technologies. The new facility is already paying dividends with a large variety of new technologies under evaluation including a network dissemination package, electronic warfare packages, and new encryption technologies. The Technology Center works hand in glove with our Rapid Integration and Acceptance Center located at Dugway Proving Ground, Utah. The combination allows us to progress rapidly from technology assessment to flight testing to fielding. Additionally, it allows technology developers to integrate with our real hardware, potentially shortening the flash to bang timeline of a new technology by greater than 50 percent.

These are just a few activities across the UAS community that will largely define the future of Army Unmanned Aircraft Systems. There are many more to come. Until next time, keep safe.



The Extended Range/Multi-Purpose unmanned aircraft system is the Army's most advanced system providing combatant commanders a much improved real-time responsive capability to conduct long-dwell, wide-area reconnaissance, surveillance, target acquisition, communications and attack missions. An early version of the system, known as the Quick Reaction Capability (QRC), was fielded in Iraq in July, marking a place in history for the first operators to manage this system. The next fielding, known as QRC-2 will include weaponized systems capable of carrying and launching up to four HELLFIRE® missiles. The operators who will deploy with these systems are in the middle of their training, and ready to take their place in history in 2010. The stories of both the QRC-1 (above) and QRC-2 (below) operators follow on the next six pages.

Quick Reaction Capability-1

FIELDING UAS ASSETS TO GROUND COMMANDERS FASTER

The use of Unmanned Aircraft Systems (UAS) technology, such as the Army's new MQ-1C Sky Warrior®, continues to revolutionize how the Army conducts combat operations. UAS development and fielding has increased 25 fold in the last seven years, however, the time periods observed for development and fielding these systems are lengthy, according to Defense Secretary Robert M. Gates who spoke to students of the Air War College and the Air Command and Staff College at Maxwell Air Force Base, Ala., April 21, 2008.

Due to Secretary Gates' urge to field "75 percent solutions over a period of months" rather than 100 percent solutions which take more time to develop, the U.S. Army Aviation Center of Excellence answered the call to duty by exploring ways to provide ground commanders the first Extended Range/Multi-Purpose, Medium Altitude Endurance (MAE) UAS Company faster than past initiatives.

By mid-October 2008, E Company, Unmanned Aircraft Systems Training Battalion (UASTB), Fort Huachuca, Ariz., or Quick Reaction Capability-1 (QRC-1) was formed. After more than eight months of training to support full-spectrum combat operations, approximately 16 Soldiers from Echo Company deployed early July in support of Overseas Contingency Operations (OCO) in Iraq.

This company, consisting of a commander, first sergeant, 12 operators and three support personnel, is charged with running 24-hour flight operations for a one year deployment. UASTB officials are confident in the readiness of theirs and expect much success throughout the deployment.

TO A QUICK REACTION CAPABILITY

In the past 15 years, the majority of UAS operations and missions focused on dissemination of real time, full motion video to commanders and leaders within the battle zone to provide situational awareness. Most missions placed UAS operators as camera men instructed by superiors where to focus the camera and how to utilize the system.

Other missions entailed reconnaissance of roads (counter Improvised Explosive Device), counter indirect fire and intelligence gathering of locations or persons of interest. While providing much needed intelligence to ground commanders, the operators rarely interacted with the maneuvering elements in order to fight alongside them and provide the best utilization of the UAS as an offensive asset.

However, the QRC-1 was designed to integrate into an aviation brigade to be part of the planning and execution cells throughout the entire process—from reconnaissance and intelligence gathering prior to mission development—to mission planning and executing missions.

The MQ-1C will be able to fly longer distances, stay on station longer and provide a greater array of intelligence payloads (i.e., image, signal, measuring, and geographic) than any other Army asset. This aircraft also has the capability to detect, identify, cross verify, track, engage, and neutralize a single target autonomously or through cuing of other Department of Defense assets. With the range and scope of mission sets, UASTB officials expect it to be common for these operators to cue Naval, Air Force or Marine assets onto a target.

The MQ-1C will be a division level asset and will be directly tasked by ground commanders at the battalion or company level. The amount of planning and coordination conducted between the QRC-1 and the supported unit will directly influence the success of the mission.

MEETING TRAINING CHALLENGES

The QRC-1 Soldiers encountered many challenges to getting the QRC-1 into theater. They began their eight-month training in early December 2008, at a General Atomics facility in Southern California, by learning to operate the Universal Ground Control Station (UGCS), which controls the MQ-1C. Both the UGCS and MQ-1C were still in the testing and development phases of the Army procurement process. Validation and verification testing of the systems was conducted concurrently with the training.

In addition to simultaneous testing, other obstacles such as constraints of the use of technical manuals and references that explained procedures and system limitations and a training curriculum were involved, and all of the relevant documents were still in draft form.

Regardless of the issues they encountered, the QRC-1 Soldiers met all qualifications to standard. Many of the techniques were derived from rotary wing reconnaissance procedures and based on the Manned Unmanned teaming and hunter/killer operations. This experience laid the groundwork for the evolution of UAS Aerial Scout Operators and differentiating from past ER/MP MAE operators who controlled smaller, less capable systems.

FUTURE QRC-1 OPERATIONS

The QRC-1 deployed in support of Operation Iraqi Freedom and helped set the framework for the development of future quick reaction capabilities. As a result of integrating lessons learned during the initial training and deployment to Iraq and further developing doctrine, UASTB officials expect a bright future for this capability and those to follow.

Currently, two additional QRC companies (QRC-2 and QRC Replacement 1) are training for deployments in order to support OCO. ***CPT Travis W. Blaschke, ER/MP QRC-1 Company Commander***

> "The use of Unmanned Aircraft Systems continues to revolutionize how the Army conducts combat operations."

Quick Reaction Capability-2 Begins ER/MP Training and Preparation

After the highly successful train-up and subsequent deployment with Quick Reaction Capability 1 (QRC-1), the latest round of Army Extended Range Multi-Purpose (ER/MP) training is currently underway at the Unmanned Aircraft Systems (UAS) Training Battalion (TB), Ft. Huachuca, Ariz. QRC-2 swiftly came together in September anticipating their next adventure in the wild world of UAS. Comprised of several seasoned UAS operators, QRC-2 is poised to devour the next round of instruction. September marked the beginning of training with an introduction to Instrument Flight Rules. Currently QRC-2 is mastering the manipulation of the One System® Ground Control Station software. The days are spent on the MQ-1C simulators developing techniques and skills on the control panels and operating systems that will soon give fruit to highly efficient operators. The operators also receive training on the Aviation Mission Planning System for pre-mission planning and implementation into the ER/MP Software.

The ER/MP UAS is still in production and therefore requires a flexible group of Soldiers as well as instructors. Due to constant software upgrades that are inevitable when developing a brand-new platform, both Operators and Instructors must adjust to changes in Technical Manuals and Checklists. Many of the Operators are dual qualified on the Shadow and Warrior A systems which provides a good foundation of experience, making the adjustment that much easier. “Learning a system that is still in development requires an autodidactic quality that seems to be prevalent throughout QRC-2. We have a diverse group of Soldiers with a wide set of skills, all of which add to the quality of our group as a whole,” commented CPT Tae Kim, QRC-2 Commander. “This is an exciting time for UAS; QRC-2 will be making history as have our brothers in QRC-1,” CPT Kim continued. History will be made with QRC-2 as they are scheduled to be the first ER/MP unit to deploy

"I was excited to find out that I was going to be a part of QRC-2, it's history in the making. This is the latest and greatest of any of the UAS that the Army has."

the lethal HELLFIRE® missile early next year.

QRC-2 Soldiers began flight training in December. The future for QRC-2 includes flight tests and a Limited Users Test to validate their training and the equipment's capabilities. Once this training is complete, QRC-2 will deploy in support of Overseas Contingency Operations. QRC-2 First Sergeant states, "we will train and qualify our Soldiers on this new piece of equipment so that we can be proficient and be ready to fight as soon as we get boots on the ground."

Helping to ease the anxiety of the daunting tasks that lie ahead is the wealth of experience that makes up QRC-2. Of the 16 man line-up, 12 are veterans of Operation Iraqi Freedom or Operation Enduring Freedom and four of the Operators are dual-qualified. One Soldier, who has five deployments under his belt, brings a wealth of technical and tactical experience to the fight as QRC-2's most experienced technician and Operator. One QRC-2 Platoon Sergeant is also dual qualified on RQ7-B and Warrior-A and recently returned from Task Force Observe, Detect, Identify and Neutralize where he flew Warrior-A. One of the newest and youngest additions to the UAS community stated, "I am very happy to be surrounded by all the experience this company has brought to the table. I feel that I am blessed to be involved with the new QRC-2; it is an ongoing adventure that keeps growing and changing." Similarly, a newly promoted Sergeant remarked, "I was excited to find out that I was going to be a part of QRC-2, it's history in the making. This is the latest and greatest of any of the UAS that the Army has in their inventory."

The steady beat of the training drum continues as QRC-2 marches toward victory. QRC-2 stands ready to survey the enemy and wield the sword in the defense of the nation. "But if you do evil, be afraid; for he does not bear the sword in vain."

As the demand for UAS increases across the multiple theaters of operation, UAS technology continues to proliferate. Like precursory UAS assets, the ER/MP UAS will bring something new to the battlefield, but this time in the form of its QRC capability. Unlike previous Army UAS assets that were strictly used for reconnaissance, surveillance, and target acquisition purposes, the ER/MP will also provide a lethal package. With the advent of the QRC capability, Ground Commanders and the Warfighter on the ground can be assured of enhanced aerial protection, lethality, and situational awareness.

WO1 Eric Cooper, ER/MP QRC-2 UAS Technician

ER/MP Operators Meet the People Building the Systems They Will Fly in Combat

U.S. Army Soldiers, who will operate the newest most technologically advanced Unmanned Aircraft System (UAS) when it deploys in 2010, received a sneak preview in December of the vehicles they will fly in combat. The UAS operators toured the General Atomics Aeronautical Systems, Inc. (GA-ASI) production facility in California where the new Extended-Range/Multi-Purpose (ER/MP) UAS is being manufactured, and also had the opportunity to meet the men and women building their vehicles and thank them for their support to Soldiers.

"All combat tools have human faces behind them – from the designers to the builders to the users – and it is important for our Soldiers to thank the great people who provide the tools they need to fight the unfortunate conflicts we face," said COL Gregory Gonzalez, Project Manager, UAS, U.S. Army. Gonzalez's office is responsible for the acquisition and fielding of all Army UAS's.

This class of UAS operators has extensive experience operating UAS in theater, including Warrior-class systems, Shadow® and Hunter UAS. They are deploying two years ahead of schedule to quickly bring this newest technology to areas of conflict. The rapid deployment is in response to the April 2008 challenge by Defense Secretary Robert Gates to field tools to Soldiers faster. The Army developed the Quick Reaction Capability (QRC) initiative to speed the ER/MP delivery from 2011 to 2009, deploying the QRC-1 unweaponized system -- also known as Sky Warrior Block 0 -- in July 2009 in support of Overseas Contingency Operations in Iraq. This new class of operators will deploy with QRC-2, weaponized with four Helicopter Launcher Laser Guided Fire-and-Forget (HELLFIRE®) missiles, in FY10. The missile, originally designed for use on Apache helicopters, is modified with a new inertial navigation system and the autopilot modified to accept target location information, allowing for improved high altitude engagements.

"The Army developed the ER/MP UAS program to meet the growing demand from combatant commanders who need real-time information and the capability to conduct long-dwell, wide-area reconnaissance and surveillance, as well as precision strike missions," said LTC Kevin Messer, ER/MP product manager. "Time and time again, unmanned systems save Soldiers' lives by providing the right information at the right time."

The latest technologies available in the ER/MP UAS include a heavy fuel engine, triple redundant avionics, and redundant flight controls/surfaces, network connectivity that reduces information cycle time and enhances overall battlespace awareness. It is capable of flying for more than 30 hours, can operate with or without satellite communications data links and, in addition to four HELLFIRE missiles, it will carry a Lynx® Block 30 Synthetic Aperture Radar/Ground Moving Target Indicator (SAR/GMTI) for immediate situational awareness and target detection. The SAR/GMTI is manufactured by GA-ASI.

Sofia Bledsoe, Public Affairs, PEO Aviation

COL Gregory Gonzalez, Project Manager for UAS, recognizes Soldiers with a coin presentation prior to a tour of the General Atomics manufacturing facility.

Top: (Left to Right) SGT Darick Ladner, SGT Brian LeClaire and SGT Jonathan Adams tour the General Atomics facility in Poway, Calif.
Bottom: COL Gregory Gonzalez, Project Manager for UAS, addresses Soldiers and the employees of General Atomics.

ER/MP HELLFIRE® Test Update

On November 22, 2009 a major milestone was "hit" literally for both the ER/MP program and the HELLFIRE® P+ program: MQ-1C #70114 performed a successful boresight, followed by successful dry runs against a target, a "cold pass" where the live missile was powered up but the switch was not enabled, and a "hot pass" where the missile came off the inboard rail of the left wing and impacted its target. There were a lot of "firsts" associated with this initial test flight: the first missile fired from the MQ-1C platform, the first missile firing commanded from a One System® Ground Control Station, and the first P+ missile recognition by a platform. The ER/MP system capabilities have been assessed against a variety of conditions to include shots at varying altitudes, against stationary and moving targets, using different auto-track modes, and most interestingly, with varying offset angles. The MQ-1C combined with the new HELLFIRE P+ missile is a lethal combination that will provide Soldiers a new target attack capability along with reconnaissance and surveillance.

Jeff Crabb, Deputy Product Manager, UAS P. O.

Mobile Tower Ensures Eyes Stay on the Horizon

During the Pre-deployment Site Survey to Operation Enduring Freedom in July 2007, the C Band antenna was elevated to maintain line of sight between the Ground Control Station and the Warrior Alpha aircraft. This was from run up to taxi and then subsequent take off to include climb out to exit down range for the mission.

To accomplish this feat, a military van was modified with a tower on the roof. The prototype did not provide the height needed to cover a full 360 degree positive look at our aircraft, nor did it provide adequate safety for the personnel required to install it or perform periodic maintenance.

Tactical Concepts leveraged off the Redundant Array of Independent Disks (RAID) programs idea for the tower. Since then, Tactical Concepts purchased 31 towers and distributed them across the Warrior Alpha platform and provided them to QRC-1 and QRC-2, the Unmanned Aircraft Systems Training Battalion for the Sky Warrior Program, Northrop Grumman for its TCDL link, and the Ground Based Radar being used at El Mirage, Calif. Tactical Concepts assisted the Department of Homeland Security Border Protection personnel using the same C Band data link.

The Tactical Concepts team has one at the flight line at El Mirage that provides left and right hand pattern capability for training new unmanned aircraft pilots.

Currently, the Tactical Concepts team is providing information and guidance to the Shadow team satisfying their requirement for elevating their antenna when operating in deployed areas with high vegetation such as trees that are 60- to 80-feet tall.

Tactical Concepts has two towers at an Afghanistan site with a Ground Data Terminal (GDT) and Portable Ground Data Terminal (PGDT) elevated to 56-feet Above Ground Level (AGL) and the same at Fort Huachuca, Ariz. for the Warrior Alpha training program.

Tactical Concepts personnel anticipate possibly deploying four towers to Task Force Observe, Detect, Identify, and Neutralize, in Iraq to get their antennas off the man made wooden platforms that are also being used by several other units for their antennas. This improvement will elevate the antennas an additional 16-feet above current heights.

QRC-1 has two towers deployed with them in Iraq and two more towers are with the QRC-2 assets awaiting deployment.

Tactical Concepts is evaluating deploying towers to the Rapid Integration and Acceptance Center facility at Dugway Proving Ground, Utah so operators can offset their antennas from the runway

and not be masked by any buildings or hangars. This offset will allow 100 percent line of sight to C Band transmissions during flight for that facility.

Tactical Concepts provided a weather mount installation for the S-280 shelter that allows the removal of the original tripod mount and safety straps to hold the weather instruments in place. This was a cost savings of approximately $1,000 as the tripod was a professional, sturdy camera tripod, designed to be outdoors. The instruments are now mounted on a staff, removable from the S-280 for transport and with no straps required.

In the near future, Tactical Concepts will have this tower certified for external sling loading on CH-47. The tower is already certified to fly internal on C-130, C-17 and on the C-5 aircraft.

If your task seems insurmountable, call Tactical Concepts to provide answers and procurement suggestions to assist your platform, resulting in better products for the Soldier.

John Talley / Sigmatech, Logistician / Analyst, Tactical Concepts, UAS P.O.

Left to Right: COL Gregory Gonzalez, Project Manager, UAS; MG Roger Nadeau, Commanding General, Army Test and Evaluation Command; Utah Lt. Gov. Greg Bell; BG William T. Crosby, PEO Aviation; COL William King IV, Commander, Dugway Proving Ground, and Mr. Tim Owings, Deputy Project Manager, UAS, officially open the Army UAS Project Office's Rapid Integration and Acceptance Center, Michael Army Airfield, Dugway Proving Ground, Utah.

RIAC Opens for Business

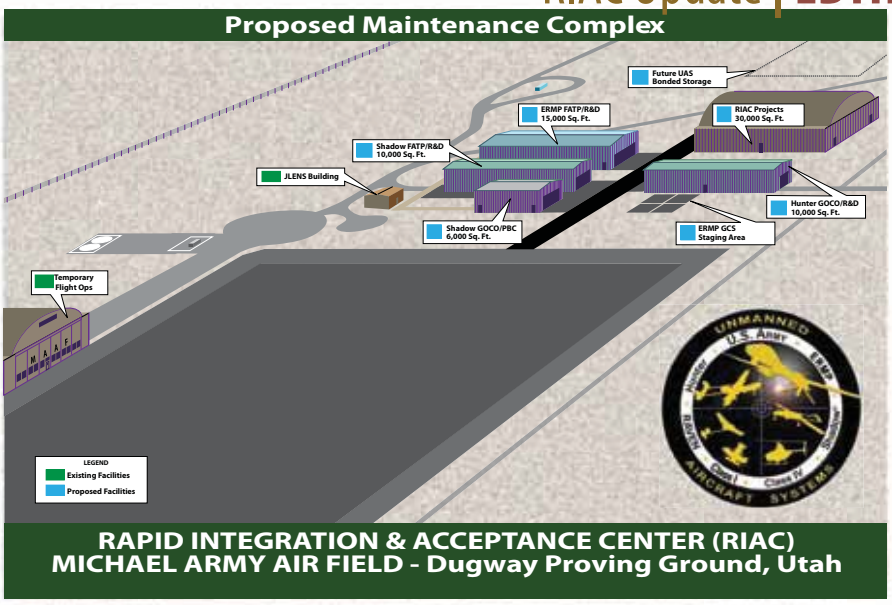


Figure 1

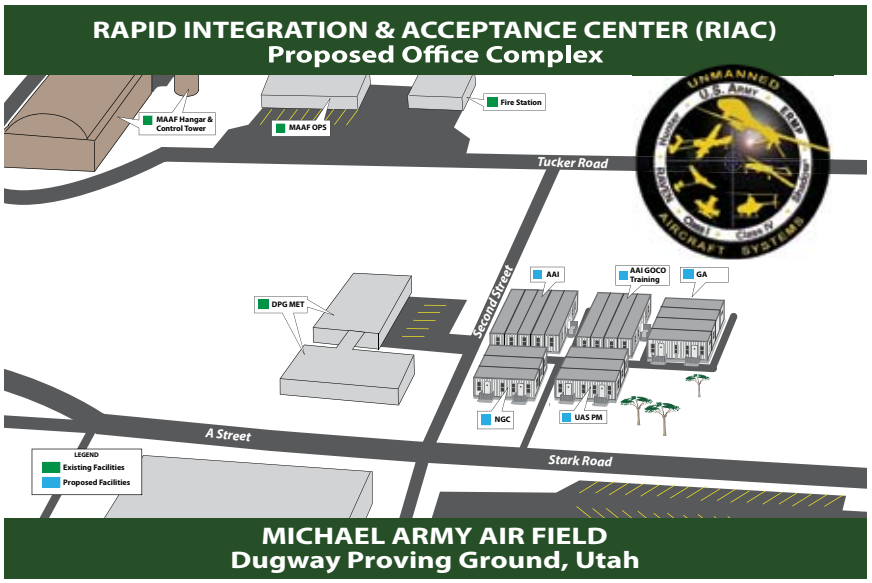


Figure 2

On September 23, 2009 the Rapid Integration and Acceptance Center (RIAC) held its official ground breaking and ribbon-cutting ceremony at Dugway Proving Ground (DPG), Utah. The long-awaited event, featuring exciting demonstration flights, was the perfect way to showcase the wide-ranging capabilities of UAS PO.

The state-of-the-art RIAC facilities at DPG will include a 6,000 square foot hangar, a 10,000 square foot hangar, a 15,000 square foot hangar, a 10,000 – 15,000 square foot hangar, and a 30,000 square foot hangar (See Figure 1). Each facility will accommodate specific air vehicles and be utilized for training, maintenance and testing. Each system will also have an exclusive area around the flight line for ground-control equipment. An office complex comprised of modular trailers for each contractor is being constructed in close proximity to the hangars (See Figure 2). The final phase of building projects will consist of constructing a bonded storage facility. At completion, the UAS community will have one unified location for development activities and acceptance testing, thereby ensuring that the Soldier is continually armed and outfitted with state-of-the-art, cutting-edge equipment.

Continued on Page 22-RIAC

The soon-to-be renovated Tooele Shadow Logistics building will include loading dock doors, security lighting, perimeter security fencing, and parking lot upgrades. Interior upgrades will feature office space, secured Government Bonded storage, new sealed flooring, insulation, and a controlled climate.

Shadow Logistics Occupy Tooele
TO SUPPORT RIAC

On September 23, 2009 the grand opening for the new Rapid Integration and Acceptance Center (RIAC) was the headline attraction at DPG in the Utah desert. BG William T. Crosby, Program Executive Officer, Aviation, COL Gregory Gonzalez, Unmanned Aircraft Systems (UAS) Project Manager, and LTC Andy Hamilton, Product Manager, Ground Maneuver–Shadow, with numerous local, military and civilian dignitaries, were present for the prestigious event with flybys from the most advanced unmanned aircraft in today's Army.

Several months before the grand opening ceremonies, the Shadow team was directed to establish an initial presence at Dugway by putting a system on the ground ready for flight operations–basically planting the UAS Project Office Flag. As flight planning was taking shape, it was quickly realized that flight operations and logistics operations could not adequately coexist in the same aircraft hangar facility on Michael Army Air Field. The Dugway flight operations currently have limited facilities to support the UAS start up of flight operations until new facilities are in place. This process requires time and funding and the Tactical Concepts Team on the ground at Dugway is hard at work making provisions to get support facilities and hangars erected to support the RIAC operation, but with the immediate need for logistical support for Shadow flight operations, an interim solution for logistical facilities had to be found. Little did anyone know that the interim solution would lead to facilities at nearby Tooele Army Depot (TEAD), Utah.

The Base Realignment and Closure (BRAC) within the Army Material Command base structure left TEAD with many vacant operational facilities. With the announcement of the UAS RIAC operations inhabiting the nearby DPG, the Commander, Tooele Army Depot, COL Yolanda Dennis-Lowman, offered the UAS PO the opportunity to consider multiple facilities at TEAD for logistics and operational support while standing up the new RIAC operations. The Ground Maneuver Product Office (GM PdO) was the first to take advantage of COL Dennis-Lowman's hospitality and cooperative spirit.

The plan to relocate the GM PdO and prime contractor AAI Shadow Logistics Operation from Ft. Huachuca, Ariz. (commonly referred to as Black Tower) has required extensive planning between GM PdO and AAI. There will be a period where dual operations will be at TEAD and Black Tower. These dual operations have invited the opportunity to evaluate the current operations at Black Tower and explore areas for improvement when standing up the new operations at TEAD. In August, a team consisting of subject matter experts was formed with members from AAI, TEAD, Shadow, Tactical Concepts and Lean Six Sigma (LSS) support from Technical Management to document the current operations at Black Tower and compose a plan to streamline the new operations at TEAD. The team conducted Gemba walks, a Japanese term meaning the actual place, of the warehouse facility and annotated the required facility upgrades necessary to bring the TEAD warehouse to logistical and security operational standards.

A LSS exercise known as 3P (Production, Process, Preparation) was conducted where the team simulated the process flow of materials through the warehouse facility to achieve the maximum throughput. From the 3P exercise, the team developed a conceptual facility layout to include workstations and warehouse storage requirements.

With the logistical support for Shadow located at TEAD, a short 45-minute drive through the Utah mountain pass, it presented new challenges for the GM PdO/AAI Team. As a result, the need for a forward pre-staging and post-staging area for equipment in the Acceptance Test Procedure process had to be identified near the Dugway flight line. A nearby facility was identified at Dugway to serve as a temporary forward staging location until

COL Gregory Gonzalez, UAS Project Manager, addresses the crowd and attendees tour the facilities during the opening of the UAS Rapid Integration and Acceptance Center at Dugway Proving Ground, Utah, on Sept. 23, 2009.

the new 10 thousand foot building for Shadow can be operational in the spring of 2010. The geographical separation between the flight operations at Dugway and the logistical support located at TEAD generated a need for AAI to evaluate their logistic processes at TEAD. AAI engaged their LSS resources to map the current value stream of the products as they flow from the AAI Manufacturing facility in Hunt Valley, Md., to the end customer. The value stream map identified several areas where quick win improvement opportunities will be capitalized upon and other areas where process improvements will be addressed as the operations become functional at TEAD. The team assembled once again at TEAD in October to review the operations move plan and evaluate the renovation construction progress. The renovation of the warehouse facility is moving rapidly and the warehouse was tentatively scheduled for AAI occupancy by the end of 2009. The persistent effort by the GM PdO to address process improvements with the move of Black Tower operations to TEAD and providing AAI with LSS support has proven to be an early success in establishing requirements and communication.

From conception to reality, the UAS RIAC buildup is moving full steam ahead and the Utah winter months will not decelerate the pace. Shadow Logistics is already planning a conceptual design for a Logistics Center of Excellence that will reside on the grounds of Michael Army Air Field at Dugway to replace the temporary Logistics facility at TEAD. This Logistics Facility is currently scheduled for Phase 3, Project 7 of the overarching building plan at RIAC and is slated as a Military Construction project. The Shadow community continues to lead the way in the UAS Project Office.

Al Martin, Logistics Management Specialist, Ground Maneuver Product Office, UAS P.O. and Timothy Franklin / Belzon Lean Six Sigma Black Belt, Technical Management Division, UAS P.O.

I-GNAT Retires with High Marks

On July 12, 2009 Army I-GNAT AI-001 took flight for its final mission. The success of the I-GNAT system is a true benchmark for success in unmanned aviation. The system was deployed for the Army in March 2004 in response to a call for immediate Intelligence, Surveillance and Reconnaissance assets to fly extended hour sorties in the skies of Iraq. Over the next five years, the fleet of five aircraft flew nearly 40,000 flight hours on 3,000 sorties. I-GNAT AI-001 flew 14,114 flights hours; an unprecedented and unmatched airframe total for any branch of service. This impressive achievement blazed the trail for the future unmanned aircraft and garnered respect in the hallowed halls of aviation history.

Warrior Alpha Soars into the History Books

Warrior Alpha and Task Force ODIN-Iraq (TFO-I) recently achieved 50,000 combat flight hours in less than three years. This remarkable accomplishment occurred since its inception in October 2006 and is even more notable because it all started by flying one 9-hour sortie per day. TFO-I now flies over 1,900 hours a month in support of the Warfighter in both Intelligence, Surveillance and Reconnaissance and Reconnaissance, Surveillance and Target Acquisition configurations. Achieving 50,000 flight hours at one site in less than three years is a first for both the UAS Tactical Concepts Product Office and General Atomics (GA). No other GA platform has achieved what TFO-I has done with Warrior Alpha in its first three years.

Hunter TCDL System First Flight in OEF

The UAS Project Office achieved a new milestone in November fielding and flying the first Tactical Common Data Link (TCDL) equipped UAS in support of Operation Enduring Freedom. A Hunter MQ-5B UAS equipped with dual Ku-band TCDL datalinks was flown in Afghanistan under the control of a Block-II One System® Ground Control Station and TCDL equipped L3 Communication Stinger-II Ground Data Terminal. The TCDL Hunter MQ-5B aircraft will benefit from a single aircraft extended Line of Sight range of operation. This capability doubles the range of the C-band legacy system and will have an increased downlink enabling the implementation of high bandwidth payloads to greatly increase mission effectiveness for Soldiers engaged in the Counter-Improvised Explosive Device. In continuing support of the ISR Surge efforts, UAS PO and Northrop Grumman plan a second fielding of a TCDL equipped Hunter in the fall.

Russell Fortner, Hunter Team Lead Engineer, UAS P.O., Bill Smithson, GDIT, Hunter Logistics, UAS P.O., Matt Brecher, Hunter Logistics, UAS P.O.

"This capability will greatly increase mission effectiveness for Soldiers."

The Hunter MQ-5B Aircraft with TCDL is fielded in OEF.

Hunter TCDL Ground Data Terminal with Radome.

U.S. Army SPC Michael Thomas looks for foreign object debris as SPC Christopher Ellis and Department of Defense civilian contractor Rafael Torres Jr., assigned to UAS Platoon, Alpha Company, Special Troops Battalion, 3rd Brigade, 1st Cavalry Division, reset the shuttle of a Shadow launcher.

Working the Army's UAS Future Strategy

The mission of the U.S. Army Unmanned Aircraft Systems (UAS) Center of Excellence (CoE) is to provide integration and coordination with all Army organizations, the joint services and other Defense Department agencies, to achieve the U.S. Army UAS strategy including concepts for current, emerging, and future UAS interoperability with all manned and unmanned systems.

As UAS capabilities mature, advance and become more prolific, these systems allow commanders the ability to employ a variety of UAS across the breadth and depth of the area of operations–using the best available UAS with the appropriate mission packages–to achieve mission objectives across the full spectrum of military operations.

By virtue of collaboration amongst the U.S. Army Aviation Center of Excellence (USAACE), the Army Maneuver Center of Excellence (MCoE), the U.S. Army Military Intelligence Center of Excellence and the Army Aviation and Missile Research, Development and Engineering Center (AMRDEC); the Army UAS CoE produced a UAS Futures white paper covering the current year through 2035.

This paper provides background for current and future UAS developments, addresses current identified shortcomings realized through operational experience, recommends the way ahead and provides the Soldier on the ground greater capability and reduced risk. The white paper serves as the cornerstone for the overall Army UAS Strategy planned anticipated to be published in 2010.

ARMY UAS STRATEGY

The Army UAS Strategy outlines how the Army will develop, organize, and employ UAS across the full range of military operations for the next 25 years and centers on the Soldier on the ground with the theme: "Army UAS – The Eyes of the Army."

Current Army UAS provide Soldiers a distinct advantage by providing real-time or near real-time situational awareness; multi-role capabilities including communications, reconnaissance and armed response; and the ability to dynamically re-task through autonomous operations.

The Army UAS Strategy focuses on distinct time periods: Near-Term: 2010 to 2015, Mid-Term: 2016 to 2025, and Far-Term: 2026 to 2035.

Within each of these sections UAS capabilities are described in context of doctrine, organization, training, materiel, leadership, personnel, and facilities.

OPERATIONAL VISION

The Army UAS provide organic and direct support for reconnaissance, surveillance, security, attack, utility, and command and control to all warfighting functions at tactical echelons.

The Army envisions universal operators capable of controlling all Army UAS platforms, including multiple platforms simultaneously, from a common ground control station sustained by universal UAS maintainers.

Actionable combat information is disseminated in real time vertically and horizontally across multiple tactical echelons via a robust network and a common remote video transceiver that doubles as an unmanned aircraft controller to allow Soldiers direct control of UAS mission payloads.

NEAR-TERM

The near-term focus of the Army UAS capabilities in 2010-2015 is to continue rapid integration of existing technologies to meet the Warfighter's battlefield requirements.

Reconnaissance and surveillance missions in support of intelligence, surveillance, and reconnaissance operations remain the Army's primary UAS focus to support Overseas Contingency Operations.

The near-term vision is fairly well-defined and is characterized by established UAS procurement and sustainment budgets and documented personnel requirements in tables of organization and equipment.

The continued development and fielding of additional and improved UAS systems demonstrate the Army's commitment to unmanned operations in the near-term.

Additionally, the Army must continue to invest in the rapid integration of emerging capabilities including: the

the fielding of the Extended Range/ Multi-Purpose UAS to meet operational requirements in the medium altitude ranges, the One System® Remote Video Terminal and the Universal Ground Control Station (UGCS) to support the Army's UAS capability vision and interoperability architectures.

MID-TERM

The mid-term focus of the 2016-2025 time frame is on full integration of UAS into all aspects of Army operations. Technological advances increase UAS capabilities and overall autonomy; however, UAS will never replace thinking, flexible and prepared Soldiers. Future UAS must support rapid and fluid operations, which enhance an increasingly net-centric force. UAS operations must be more precise to increase targeting accuracy and increase effects to mitigate collateral damage.

Desired mid-term capabilities include the use of optionally piloted vehicles which enable an increase in the operational tempo of manned platforms already in our inventory, and advancements in unmanned vertical takeoff and landing aircraft.

Additionally, Army UAS operators gain the ability to simultaneously manipulate multiple unmanned aircraft platforms from a single crew station though the use of a UGCS.

FAR-TERM

In the far-term, 2026-2035, the Army produces manned and unmanned systems with substantial commonality and technologies that increase endurance and carrying capacity, while decreasing size, weight and power requirements.

Future technologies will close the performance and airworthiness gaps with fixed wing systems, including rotor, propulsion, airframe and hybrid configurations providing point-to-point capability.

Future expeditionary operational environments require increased aviation support including all weather capability, fully compliant sense and avoid capabilities, seamless national airspace integration, universal commonality, and integrated capabilities such as swarming and other teaming capabilities.

Technical research expands the barriers of more efficient flight with significant improvements in space, weight and power.

UAS operations will enlarge the flight regimes and expeditionary utility of UAS, including delivery or retrograde of high value payloads, high reliability and low cost of operation, propulsion, operations in extreme conditions, reduced or zero visibility, improved data throughput, autonomous operations, and reduced manning requirements including forward area aircraft refueling and servicing, system hardware and operator personnel. Human factor considerations, advances in autonomous operations, and employment will offset the majority of the workload from the operator to the platform, and support near hands-off operations.

Capabilities will increase, while size and weight continue to decrease, thus providing significantly greater capabilities in a much smaller package.

Offensive operations, while remaining at the command of a human operator, will become more automated leaving the fire decision in the control of the operator.

Multi-purpose and multi-role aircraft and payloads will be standard with operational utility decided at the point of launch rather than by class or model of aircraft.

FUTURE CHALLENGES

There are two fundamentals of UAS architectures which are critical for the Army's future UAS strategy: Commonality and an Open Architecture Systems approach.

Commonality – including airframes, control stations and operating software, payloads and power sources – decreases logistical burdens in terms of training, stocking and resupplying.

Commonality supports economies of scale and enables production of more equipment at a reduced per unit cost.

Open Architecture Systems provide for rapid integration and a fundamental 'build-to' baseline that enables plug and play operation.

These fundamentals apply throughout the system, including all aspect of UAS operations.

As the Army builds its way-ahead, both fundamentals will remain strongly at the forefront.

Continued on page 22

RIAC (Continued from page 15)

The facilities and staff of the RIAC have the task of providing swift and efficient testing of UAS improvements ensuring that they are in the hands of the Soldiers as quickly as technologically possible. While the business primarily is serving the Army Soldier, the RIAC will test concepts that enhance UAS capabilities beyond the scope of military usage; currently, the Center is working with other governmental agencies such as the U.S. Forest Service and Defense Advanced Research Projects Agency (DARPA). To date four programs are in development at the RIAC facility.

The first one, the Type-2 Interim Encryption Systems (TIES) conducted its initial test at Dugway. The Type-2 project, which will allow for digital video encryption, flew in October 2009. The target goals were to test the system maximum reception of a Mobile Directional Antenna System, to assess video quality after a series of target board runs, to test antenna switching logic and control through a series of maneuvers and to test antenna coverage through a series of maneuvers and AV-to-RVT geometrics. The TIES system was integrated into a Shadow® Tactical Unmanned Aircraft System and flew for approximately nine hours. The flights were successful and data collected is in the process of being evaluated in preparation for the next round of testing, slated to occur in 2010.

Heterogeneous Airborne Reconnaissance Team (HART) test is being conducted in concert with DARPA. It is an initiated effort to enhance video processing and imagery geo-registration almost instantly – within mere seconds of collection. The premier data collection flight was completed in November 2009. This was the first of four tests that will be conducted at DPG. The target goals of this test were to collect data from Shadow Ground Control Station and One System® Remote Video Terminal in order to support geo-registration and image analysis, to test and demonstrate motion imagery distribution across Tactical Operations Center (TOCs) and queries from remote Rack-mounted Data Archive and Retrieval system (RDARs)/TOCs and to demonstrate field of view impact on operators during day/night crossovers with Electro-Optical/Infrared back and forth switching. The HART test data will be analyzed in preparation for follow-on flights in 2010.

Additionally, the RIAC is supporting the Special Operations Command with various tests, and the final RIAC test scheduled at this time is the CORPORAL JCTD program for the U.S. Navy and Marines. This program is for a new captive carry payload pod that will be integrated onto the Shadow. Testing is tentatively scheduled for late FY10.

The RIAC facility is receptive to and available for all UAS testing. The state-of-the-art UAS accommodations at DPG, when complete, will provide a convenient, one-stop location for the UAS program in its entirety. ***Ferne Wlodarski, Test Lead, UAS P.O., William Clark / Aerodyne, RIAC Technical Lead and Jennifer Christensen, RIAC Site Lead, UAS P.O.***

Future (Continued from page 21)

FUTURE ENABLERS

As part of the Army's strategy, system survivability, footprint, autonomy, commonality and interoperability, and open systems architecture are among the general areas of concern. Specific areas include platforms and performance; control station complexity; data link security, throughput, and product dissemination; sensor and mission equipment package size, weight, power and capability; and operator training and qualifications.

The USAACE, in conjunction with the MCoE, Intelligence CoE, AMRDEC and UAS partners across the Army and Joint community, will identify and prioritize enablers to bridge these and future identified gaps.

The Army Science and Technology process supports the future vision by addressing and reducing these gaps in order to provide the technological support to fortify the overall Army missions.

CONCLUSION

The Army UAS CoE is leading the collaboration efforts to develop a flexible, comprehensive and actionable UAS Strategy for the Army which will encompass the 2010 to 2035 time frame and is expected to be published in April 2010.

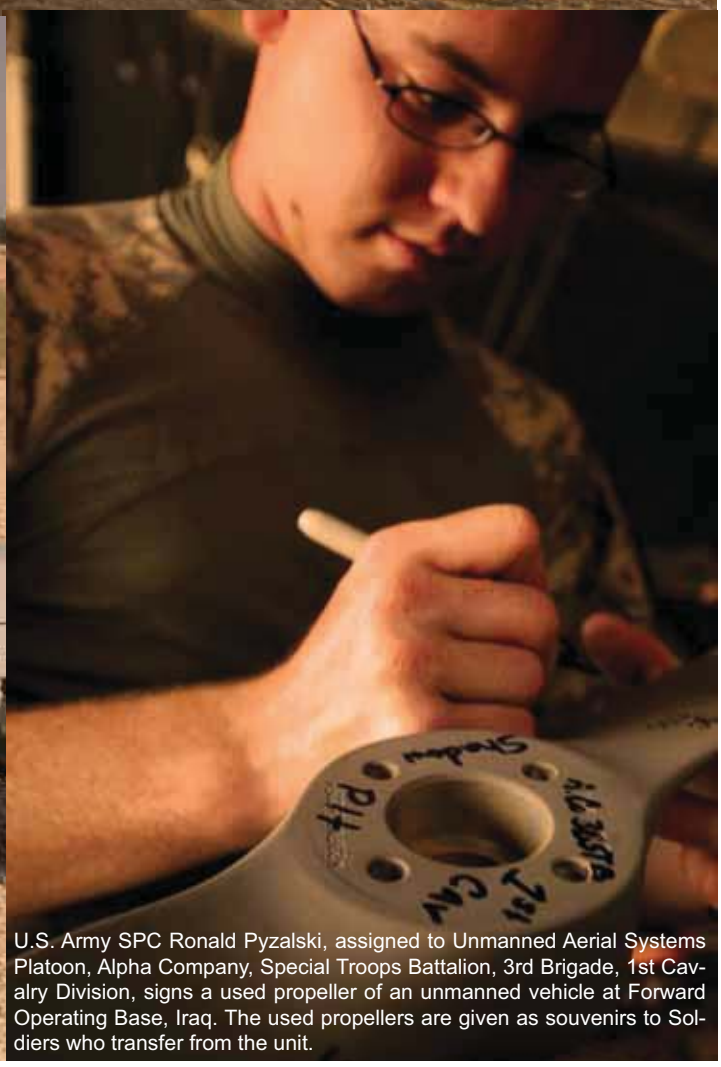
The roles, missions and numbers of Army UAS have expanded at unprecedented rates since 2001 and the Army's primary focus of UAS is to support the Soldier on the ground and protect the force.

The Army UAS will evolve to a much broader level of support and capability in the far-term as Army UAS are proving themselves in key and operational roles and are embraced by the Soldiers who employ them. Army UAS are the "Eyes of the Army!" ***COL Christopher B. Carlile, Director, UAS Center of Excellence***

SPC Mitchell Matney, a Raven operator for Headquarters and Headquarters Troop, 1st Squadron, 221st Cavalry Regiment, performs preventative maintenance checks and services to a Raven in Afghanistan.

SSG Jason Kudla, standardization operator, 504th Military Intelligence Company explains the dynamics of the Shadow® tactical UAS to William J. Lynn III, Deputy Secretary of Defense, during his visit to Forward Operating Base, Iraq on Sept. 11, 2009.

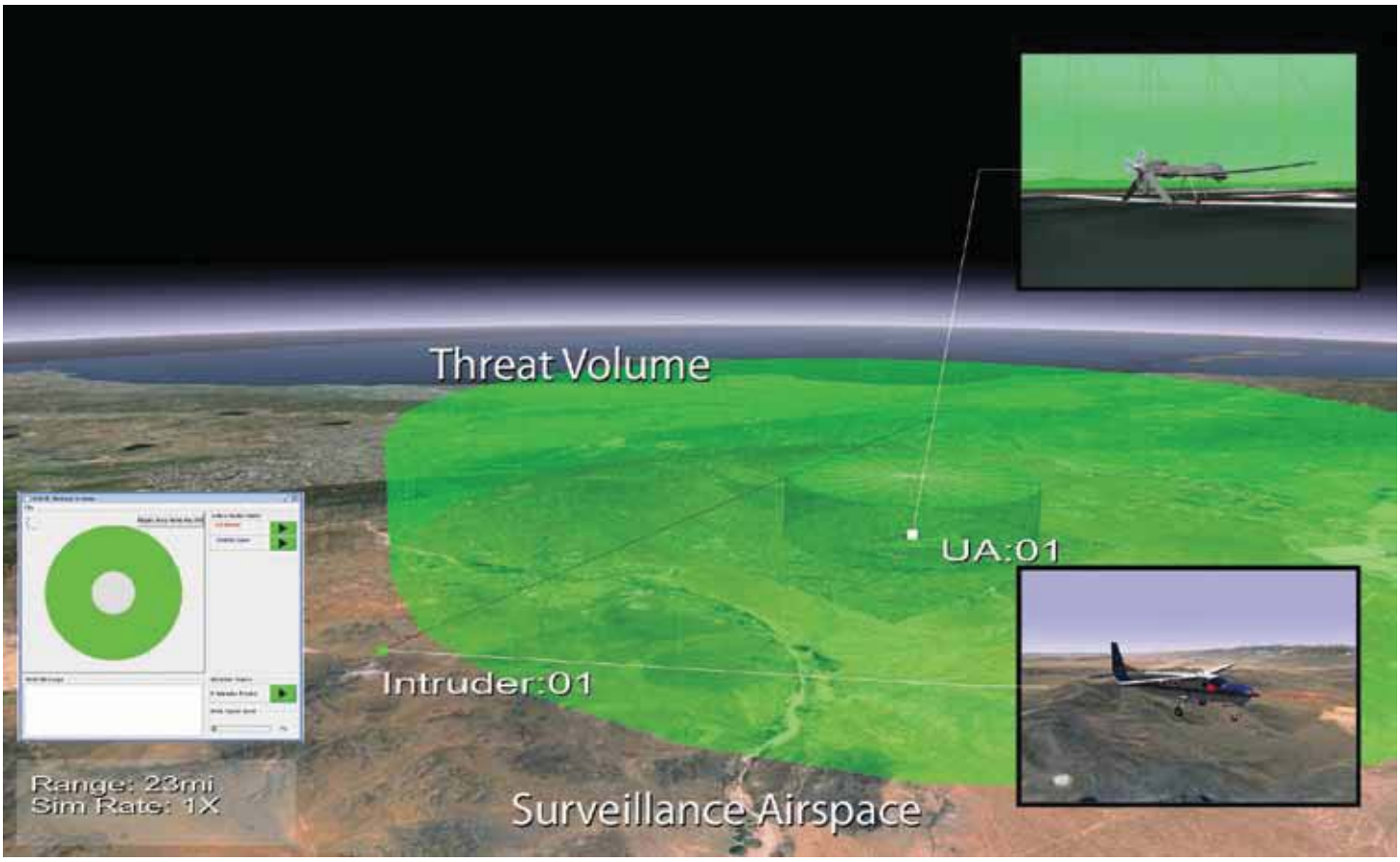
Soldiers with Darkhorse Troop -- Fort Lewis's 4th Stryker Brigade Combat Team, 2nd Infantry Division -- retrain on the Shadow at the Joint Readiness Training Center in June in preparation for redeployment to Iraq.



U.S. Army SPC Ronald Pyzalski, assigned to Unmanned Aerial Systems Platoon, Alpha Company, Special Troops Battalion, 3rd Brigade, 1st Cavalry Division, signs a used propeller of an unmanned vehicle at Forward Operating Base, Iraq. The used propellers are given as souvenirs to Soldiers who transfer from the unit.

Sight Unseen

THE NATIONAL AIRSPACE SYSTEM AND UNMANNED AIRCRAFT INTEGRATION



This image depicts an unmanned vehicle within its operational area, with an intruder approaching the threat volume. The status, shown by the Green Circle on the screen, means "authorized to fly."

Sight unseen means to do something or perform an act without seeing the object first. For the Unmanned Systems Airspace Integration Concepts Product Office (USAIC PdO), "sight unseen" has a double entendre: seeing a possibly conflicting aircraft without actually "seeing" it, and in a way that has never been done. The Army's Unmanned Aircraft Systems (UAS) Project Office (PO) established an office for the specific purpose of developing, testing and fielding a system giving UAS operators a "sight unseen" capability and allowing them an alternate means of compliance with Federal Aviation Regulation (FAR) Part 91.113.

The FAR states, in part, "When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When a rule of this section gives another aircraft the right-of-way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless well clear."

For UAS operators to comply and integrate routinely into the National Airspace System (NAS) with manned aircraft requires the integration of technology, operations and procedures, with cohesive requirements and standards.

With the proliferation of UAS in the U.S. military services to accomplish combat missions supporting contingency operations, airspace needs are growing.

Segregated airspace no longer suffices for UAS training, testing and operations.

Currently, the Federal Aviation Administration (FAA) approves Certificates of Waiver or Authorization (COA) allowing limited UAS daytime-only operations in the NAS for specific unmanned platforms at specific locations with ground observers and/or chase aircraft to comply with FAR Part 91.113.

The number of COA submissions is growing and the submission and approval process is consuming valuable time and resources of the FAA and the Department of Defense (DoD).

The COA method of flying unmanned aircraft in the NAS is rapidly becoming untenable.

Congress directed researching and developing alternate airspace integration solutions in the 2009 National Defense Authorization Act.

Senior leadership within the offices of the Secretary of Defense, the Joint Chiefs Of Staff, and the services have called for these solutions to allow UAS immediate, and ultimately unfettered, access to the NAS.

The Joint Forces Command's (JFCOM) Joint UAS Center of Excellence chaired and sponsored the draft UAS Airspace Integration Initial Capabilities Document (ICD), which was commented on by all services and now adjudicated.

The JFCOM is sponsoring this ICD through the Joint Capability Integrated Development System process.

The ICD identifies 35 capability gaps within five broad pillars to UAS NAS access: Airworthiness, Pilot & Operator Qualification, Sense-and-Avoid, Operations and Procedures, and Equipage.

GBSAA APPROACH

In response to the pressing needs identified by government leaders and this study, DoD is attacking the airspace integration challenge on all fronts.

One front is the "sense-and-avoid" and DoD has designated the Army as lead for ground based sense and avoid (GBSAA).

Tactically, GBSAA provides geographically-focused near- and mid-term levels of access.

GBSAA is the result of a rigorous process, which considers the mission, system and location for employment. The idea is to take incremental steps and gain more access as technology improves and the system is tested further. GBSAA Phase I, also called "zero-conflict airspace" (ZCA), is the first step in this incremental approach.

The ZCA will allow UAS to fly in a monitored volume of airspace until an intruder aircraft penetrates that airspace, becoming a threat for midair collision. When that occurs, the UAS adopts a safe-state by either climbing to controlled Class A airspace, flying to restricted airspace, or landing. The ZCA concept allows UAS to operate in the NAS without chase planes or ground observers and would allow night flights.

> "The Department of Defense is attacking the airspace integration challenge on all fronts."

GBSAA PHASE II

Self-separation is Phase II of GBSAA and it allows the volume of airspace around the UAS (reduced in size) to move with the aircraft so the UAS can maneuver with other aircraft inside a certain area.

The USAIC PdO team is developing and testing GBSAA and is validating a methodology for GBSAA employment at El Mirage, Calif. – one of three service-nominated "proof of concept" sites. The other sites are Beale Air Force Base (AFB) in California and Cherry Point Marine Corps Air Station (MCAS), N.C.

At El Mirage, the ZCA concept is being tested and will be used for night flights by the Sky Warrior; which is the proof of concept closest to meeting near-term goals. At Beale AFB, the ZCA concept was considered for the Global Hawk to climb from Class C to Class A airspace using GBSAA. At Cherry Point MCAS, the ZCA concept is being tested to establish the ability to fly the Shadow tactical unmanned aircraft from military Class D airspace through non-segregated areas of the NAS into a restricted area.

The USAIC PdO strategy is to continue developing GBSAAs part of a larger Sense and Avoid (SAA) solution.

GBSAA PHASES III & IV

Phase III will integrate GBSAA with Airborne Sense and Avoid (ABSAA), to provide a comprehensive capability for UAS to operate in the NAS. Ultimately, this integration would add collision avoidance capability to avoid aircraft at much closer distances than would be allowed with self-separation.

Phase IV will integrate the system into the FAA's "Next Generation" airspace of the future.

This regimented process has been closely coordinated with the FAA; it holds promise as the near-term solution and as part of the future SAA system to allow UAS routine, unfettered access to the NAS.

The standards and requirements for a GBSAA system being developed at El Mirage will be largely extensible and transferable to other locations and will be common to all SAA systems; regardless of being on-board or off-board the unmanned aircraft.

COMING TOGETHER

After validation and verification, GBSAA ZCA will be a standard solution for any location desiring this capability.

GBSAA includes several components or functionalities. First, GBSAA is sensor independent, but includes a sensor or system of sensors (currently ground radar). The system includes procedures, networks and communications, correlation and fusion, logic, and a user interface.

The Army documented and organized the El Mirage approach and methodology and is validating a jointly developed process for GBSAA so it is standard and repeatable based upon the mission, the system being flown, and the location.

Once this process goes through validation and verification, Phase I of GBSAA will be considered a universal DoD solution for immediate UAS airspace access wherever needed.

In parallel, the USAIC PdO will continue working through a rigorous developmental process to incrementally define and develop next steps, each much more complicated from a technology perspective, and lessons learned will be shared with all services working on airborne SAA.

CONCLUSION

The challenge to develop a viable SAA capability is crucial to the final objective of seamless, unfettered, routine, and shared unmanned and manned flight in the NAS. The technologies exist to realize a viable ground based SAA system, but the challenge lies in maturing and coordinating these technologies into a robust system safe enough to use for this purpose.

The Army's UAS PO, through the USAIC PdO, is leading this effort for DoD to realize this sight unseen.

LTC Trey Kelley Product Director, Unmanned Aircraft Systems Airspace integration Concepts, UAS P.O. -

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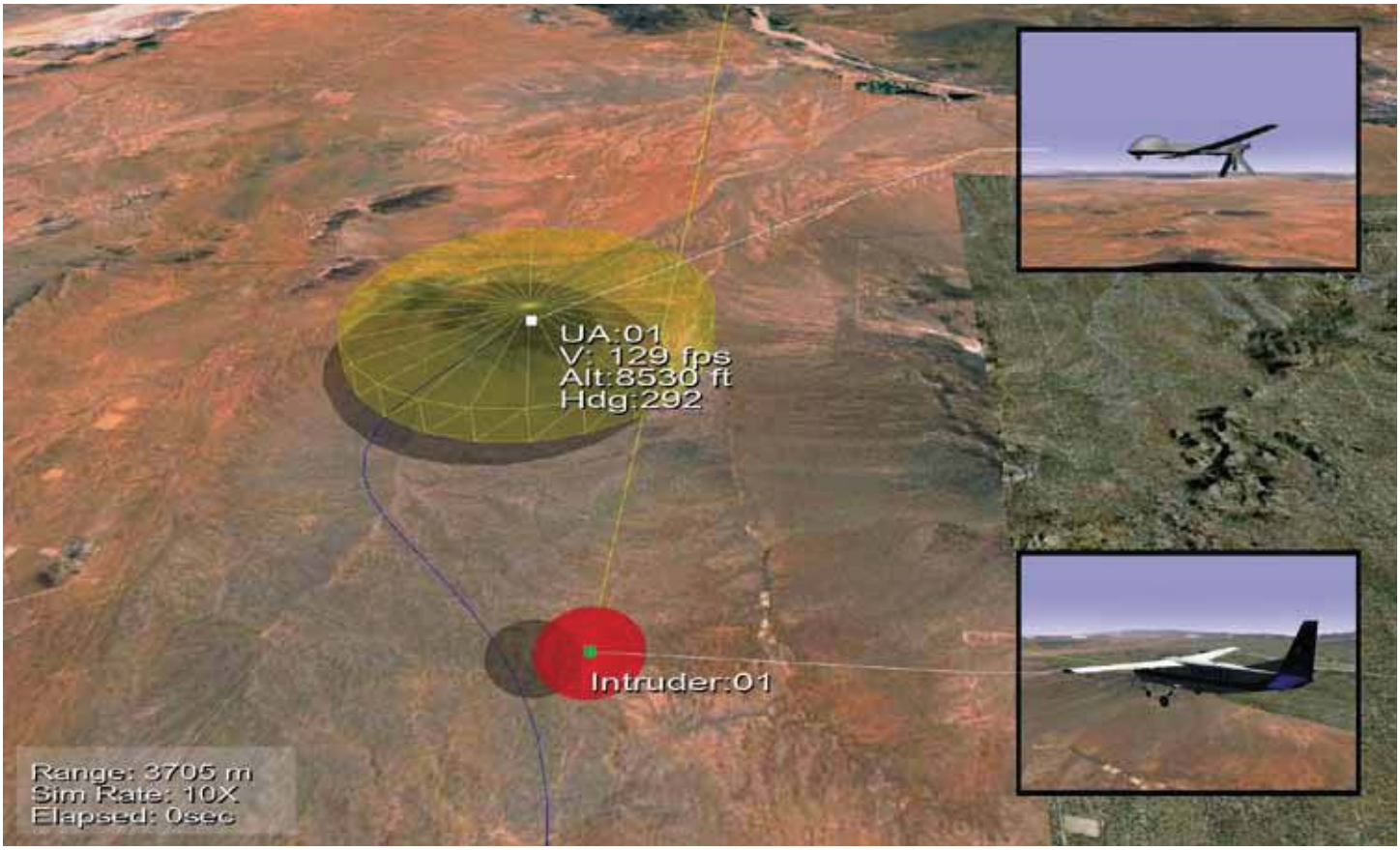
GBSAA Sensor Site #2 "Brian Ranch" Calif.



This image depicts an intruder has become a threat. The airspace and status shows red, meaning the unmanned vehicle must execute a safe state.

Class I Block 0 UAS Performs Well at LUT

September was another busy month for the Class I Block 0 Unmanned Aircraft System (UAS). A Limited Users Test (LUT) conducted at White Sands Missile Range (WSMR), New Mexico, utilized various spin-out technologies from Program Executive Office Integration but actually showcased the Class I Block 0, or as the Soldiers call it, "The Hawk." For three weeks, Soldiers from the Army Evaluation Task Force (AETF) were in the field to prove the technology feasible and practicable on battlefield by using the Hawk in a variety of missions including: Base Defense, Offense, Cordon and Search, Convoy Clearance and Urban Operations. The Hawk was definitely a force multiplier for the leaders on the ground during the LUT as it transmitted images and coordinates to various battlefield hubs and to numerous Tactical Operations Centers, providing the leadership and the Soldier with near real-time battlefield intelligence. The Hawk operator could identify a target and transmit its coordinates to higher headquarters even if the imagery transmission malfunctioned.

AETF leadership required some convincing to apply the Hawk to its full potential, however, it proved itself a valuable member of the network and quickly became a force multiplier. In fact, once it effectively spotted the enemy in the difficult broken desert terrain of WSMR, many leaders refused to start a mission without having the Hawks present and overhead.

One situational example that convinced leadership of the value and potential of the Hawk follows:

During a base defense mission, higher headquarters developed and transmitted a list of High Value Targets to be identified and destroyed. Within five minutes of the transmittal of that message the Hawk operators found the top three targets, transmitted pictures and coordinates of the targets and, consequently, artillery was used to destroy the targets. To prove that this was not a fluke, headquarters transmitted another list of High Value Targets and within a few minutes, the targets were identified by the Hawks and neutralized.

These successes created confidence in leadership and the infantrymen conducting the missions who want to be as informed as possible before conducting a mission. While I was personally observing the scout platoon conduct reconnaissance missions on the objective, the Platoon Leader and Company Commander saw enemy forces along the ingress route. The two leaders quickly formulated an alternate route based upon the Hawk-provided imagery leading to the enemy being overwhelmed and the mission's successful completion.

Several times during pre-mission reconnaissance, enemy personnel were seen seeking cover from the Hawk by running into a building. The Hawk then took up an orbiting position around the building, effectively keeping the enemy Soldiers pinned in one building prior to the fight. This lack of mobility for the enemy and knowledge for the AETF Soldiers greatly enhanced their capabilities and provided different options for the Commander. Another training highlight occurred when a Hawk operator identified enemy Soldiers setting up an Improvised Explosive Device (IED) along a major road and the IED and the Soldiers emplacing it were neutralized.

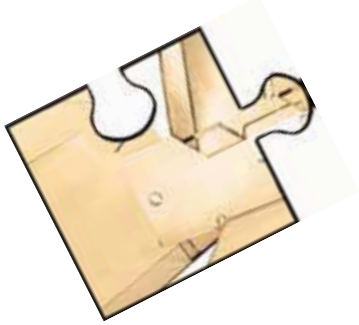
The AETF Soldiers also adapted Tactics, Techniques, and Procedures to better utilize the Hawk. During the LUT, the leaders wanted a central location from which to launch UAS missions, leading to the concept of "airport operations" for the infantry unit. The unit would launch the majority of the Hawk missions from the Forward Operating Base. When needed, the AETF would send the scouts out to launch points in these extended range operations allowed the AETF to fly the Hawk to the objective while the operators remained outside of mortar range. With the AETF in this configuration, they could provide continuous air surveillance over the objective during the mission while maximizing useful flight time. Because the operators coordinated with each other and the leadership, invaluable intelligence was provided adding to the decision making abilities of the unit.

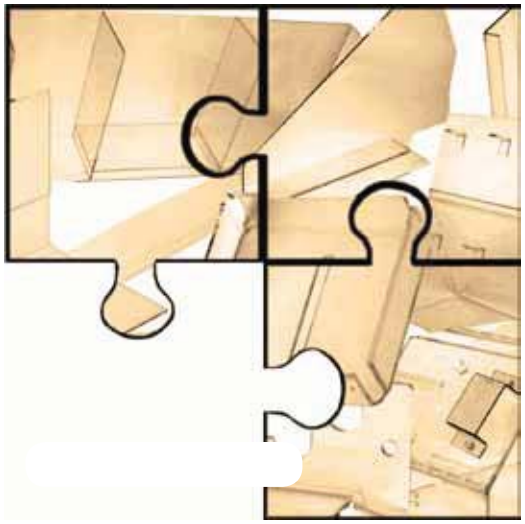
As mission after mission successfully completed with input from the Hawks, leadership grew increasingly confident in its abilities. When asked to prioritize the technologies available to them during the LUT, most leaders put the Hawk as the number one technology for fielding with the Soldier today.

MAJ Jeremy Brunet, Assistant Product Manager, Brigade Combat Team Modernization, PEO Integration

SGT Blake Myers operates the Honeywell Gas Micro Air Vehicle system, a precursor to Class I, in Iraq. Myers was the first to operate the system from outside the wire on a combat mission, April 25, 2009.

Putting Together the Puzzle - Systems Engineering





Ever put a puzzle together? Systems Engineering (SE), much like putting together a puzzle, matches varied pieces together to make one cohesive whole. It requires interacting with others in a variety of disciplines, depending on their particular industry, and striving to ensure that the unique parts can work together to perform a desired function.

In the coming months, the Technical Management (TM) Division will begin standardizing the Unmanned Aircraft Systems (UAS) Project Office (PO) in the same manner in which a puzzle is pieced together. These upcoming changes will take the PO to a more rapid but centered Systems Engineering organization in an effort to support the ever changing Acquisition environment.

To meet this challenge, TM evaluated the current established SE processes and identified a set of core processes and/or practices as the central focus. Those identified procedures used by the workforce today are Risk Management, Statement of Work, Technical Evaluation, and Standard Operating Procedures (SOPs).

• Risk Management – The Risk Management tool was rolled out earlier this year with the Medium Altitude Endurance Product Office leading the way in being the first to enter and begin tracking risk using the Risk Management tool. This simple standardization effort gives the front office a one stop shop to see risk across the office.

• Statement of Work – The Statement of Work (SOW) templates were developed for each functional area to assist in the development of future SOWs. The library consists of all possible requirements for potential use in a production SOW, not just the standard requirements that are inherent in all contracts. These templates will provide a solid framework when developing the next SOW.

• Technical Evaluation – The Technical Evaluation checklist provides a consistent approach for technical evaluations across the office.

• Standard Operating Procedures (SOPs) – The SOPs development guidance memorandum was released in October 2009 and allows for consistent formatting and content information for all SOPs generated within the PO. Future development of SOPs will be assigned a document number to provide a level of configuration control for (official and approved) internal UAS documents.

• Additional tools that are in the process of being developed are Assets Management System, SE Review Checklists, Rapid Integration and Acceptance Center (RIAC) Configuration Management and Office Wide Document Collaboration.

• Assets Management System – This automated tool will provide a consistent mechanism for establishing and tracking the system's configuration and to reserve assets for test events in support of technology/RIAC missions and future efforts.

• SE Review Checklists – Develop a consistent approach for establishing entrance and exit criteria for technical reviews (accountability and milestone progress) providing the framework for design review and requirements to proceed into the next phase.

• RIAC Configuration Management – Define a common set of guidelines for configuration management at the RIAC in Dugway, Utah that are relevant to all activities executed under the authority of the PO. The implementation of these guidelines will be outlined in the configuration management handbook.

• Office Wide Document Collaboration – Uses SharePoint as a central infrastructure for data storage and lessons learned.

Each puzzle brings challenges but with standard practices and processes in place the reward of synergy and interoperability makes the challenge worthwhile. The goal is not to complicate the process but to make the SE process repeatable and standard within the UAS PO. Remember with every great challenge there is always an even greater opportunity.

Brenda Matthews, Systems Engineering, Technical Management Division, UAS P.O.

New MUSE Software Released

The Shadow® 200 trainer software, Multiple Unified Simulation Environment (MUSE) version 8.1.1, was formally completed and released in September 2009. This version provides training capabilities for Shadow 200 Global War on Terrorism II and Software Automation 4 Delivery 3 technology insertions. The Directorate of Simulation, Ft. Rucker, Ala., accredited the MUSE version 8.1.1 for the Shadow 200 Institutional Mission Simulators (IMS) at the Unmanned Aircraft Systems Training Battalion (UASTB) at Ft. Huachuca, Ariz., the Shadow Ground Control Station Embedded Trainer, and Portable IMS (PIMS) in July 2009. MUSE v. 8.1.1 will be distributed to fielded units for the next Shadow software block upgrade. Examples of the new functionality in MUSE v. 8.1.1 for the Shadow 200 are in the table (right).

Points Nav Orbit Radius and Direction	Precision Navigation	Climb Rate Display
Disable Profile 99 in Flight	Audible Warnings	MET Sensor
Flight Termination Payload Stow	Return Home Plans	Auto Query
TALS Auto Land Abort	IR Strobe	GPS Health
Minimum Altitude Above DTED	Launch Abort	Oil Healer

The next Shadow MUSE, v. 8.3.1 release, currently in development, will contain functionality to address Shadow's new Laser Designation capabilities and allow instructors to train, launch, and land heavy air vehicles.

Development continues on the Hunter MUSE version 8.1.2. Hunter's new Automated Takeoff and Landing System (ATLS) is the focus of this MUSE release and several modifications to MUSE datalink protocol handler will be made to integrate with the new ATLS datalink structure. The Unmanned Aircraft Systems (UAS) Joint Technology Center Systems Integration Lab (JSIL) is also investigating trainer solutions for Hunter's Viper Strike, laser designator, and simulated flight control box functionality for inclusion in a future MUSE release.

Jim Perillat / SAIC, Jason Songy / SAIC, CJ Jacobs / i3, Steve Grady / Dynetics, JSIL Tactical UAS Training Systems Engineering Team

JSIL Mobile Training Team Support

In 2009, the Unmanned Aircraft Systems (UAS) Joint Technology Center Systems Integration Lab (JSIL) conducted three Mobile Training Teams (MTTs) in support of the 101st Airborne Division at Ft. Campbell, Ky., the 3rd Armored Cavalry Regiment at Ft. Hood, Texas, and the 5th Special Forces Group at Ft. Campbell. These MTTs were conducted to support Soldiers while their Shadow equipment was in RESET.

The MTTs involved delivering a Portable IMS (PIMS), and a Vignette Planning and Rehearsal Software (ViPRS) system to each unit. JSIL personnel trained the Soldiers on the use of the equipment and then left the equipment with the unit. There were no problems reported with the equipment or the software during the MTTs.

During the MTTs, the Soldiers were able to conduct training in support of Readiness Level progressions as well as tactical training. They were able to build vignettes on the ViPRS system based on lesson learned and the Tactics, Techniques, and Procedures developed during their recent deployments. These vignettes were captured by JSIL personnel to share with other Shadow units.

In addition, the JSIL provided a PIMS to the Noncommissioned Officer Course (NCO) at Ft. Rucker for use in developing a syllabus for NCO education.

The JSIL has upcoming MTT events in Alaska supporting the 25th Infantry Division (ID), New York supporting the New York National Guard, Washington State supporting the Washington National Guard and at Ft. Carson, Col., supporting the 4th Infantry Division.

New JSIL Army UAS Training initiatives that started in FY 10 are supporting several Manned-Unmanned (MUM) training activities. The JSIL is integrating the Shadow PIMS with the Apache Risk and Cost Reduction

System (RACRS). This integration is being conducted so Shadow and Apache crews can conduct tactical reconnaissance and strike training missions using the PIMS, RACRS, and ViPRS with emphasis on Shadow Operators lasing targets for Apache Block I and II crews. The JSIL is working to integrate the Shadow 200 GCS with the Aviation Combined Arms Tactical Trainer (AVCATT) to allow for MUM collective training during AVCATT training events at Ft. Rucker and deployed locations. A set of procedures is in development to provide instructions on connecting a Shadow GCS to AVCATT, and prepare the GCS for an AVCATT exercise by loading the appropriate correlated terrain databases, models, and tactical maps.

Also, the JSIL continues to develop the Universal Ground Control Station (UGCS) MUSE based embedded trainer. In October 2009, an Interim Design Review was held where the UGCS trainer design details and development status were presented. The MUSE Shadow software is being upgraded to incorporate a new NATO Standardized Agreement 4586 protocol handler and several new simulation components modeling the Tactical Common Data Link Shadow system that will be controlled by the UGCS; specifically a Universal Ground Data Terminal, air Vehicle Specific Module, Mini-C and Mini-T Air Data Terminals, and payload video control simulations.

JSIL Tactical UAS Training Systems Engineering Team

Shadow Updates

IMPROVED PARACHUTE

This past summer, the Ground Maneuver Product Office (GM PdO) began fielding a critical improvement to the Shadow® aircraft - an improved parachute. When the parachute is deployed it reduces the cost of damage and improve overall reliability. The new parachute has proven very successful since fielding and has decreased the average cost of damage by over 70 percent. This dramatic enhancement allows most aircraft to be repaired on-site, therefore limiting the impact to the operational unit. In three instances, mishaps were reduced to Class D (less than $20,000 damage). The parachute release mechanism dependability has also been significantly improved. An innovative release mechanism was integrated to greatly enhance reliability of deployment and prevent previously-experienced uncommanded deployments. A new ground release mechanism has been incorporated to cut the parachute away from the aircraft after impact.

COLD WEATHER IMPROVEMENTS

The 1101 engine, which powers the Shadow air vehicle, is undergoing upgrades for improved operation in cold weather. The GM PdO developed and is fielding oil pump improvements and a new cold weather oil to circumvent a problem encountered during the past several winters. As ambient temperatures fall, the quantity of oil pumped to the engine also falls, so manufacturer AAI Corp., in tandem with the engine manufacturer, UEL, determined the root cause of the trouble and modified the oil pump to prevent oil flow stoppage. This modified pump, in combination with the new oil will prevent numerous engine failures. When running at cold temps, we can ensure success by adding oil to the fuel tank as well. This premix, much like you run in a two-cycle engine, will further avert cold weather engine failures by adding another layer of protection in the engine. Fielding of the modified oil pumps and the cold weather oil is beginning in both Operation Iraqi Freedom and Operation Enduring Freedom. The modified engine will have part numbers ending with -40,-50, or -60.

100,000th MISSION

The Shadow completed its 100,000th mission in October. Shadows are deployed with the U.S. Army, Army National Guard, Army Special Forces and the Marine Corps, and have achieved over 445,000 flight hours, most supporting combat operations. Shadow systems were first deployed six years ago and as of November, 87 of 113 systems have been delivered.

NEW WING, FUEL INJECTION, AND LASER DESIGNATOR

Eighteen months ago, the Intelligence, Surveillance, and Reconnaissance Task Force requested upgrades to the Shadow system for Laser Designation and increased payload/endurance. Since then, the Shadow team developed, integrated, and tested these two capabilities with an Electronic Fuel Injection reliability improvement to be delivered in 2010. The fielding schedule depends on the unit's deployment status; some units will get the upgrade in theater and others in preset or reset. The software upgrade version 2.04 will be backward compatible and precede the hardware. Units will exchange their aircraft for four new aircraft and receive two weeks of training. The new wing is compatible with the previous aircraft, and the intent is to keep the wings in theater for deployed units until there are sufficient wings available for the entire fleet. Likewise, each unit will get two Laser Designator payloads (POP300LD) that will be interchangeable with the POP300.

Small UAV Ideal for Afghanistan

In Norse mythology, the all-father, Odin was a warrior god who ancient warriors beseeched for victory and protection in battle. It was said Odin had ravens that would fly over the earth each day. The ravens brought tidings of events from all corners of the earth.

Today, Soldiers in Laghman Province are also using Ravens to gather information like Odin.

"If we need to get eyes on something we'll use the Raven," said SSG Tyrone Baird, the master trainer for 1st Squadron, 221st Cavalry Regiment. "The Raven has a couple of cameras--the first is the normal day camera, but when it gets dark we switch to the thermal camera." Baird said the Raven also has GPS tracking capabilities, and said such tools make the Raven a valuable asset in gathering information.

SPC Mitchell Matney, a Raven operator for Headquarters Troop, 1-221 CAV., agrees. "The Raven allows us to gather intelligence," said Matney. "We can track targets, gather intel and scout ahead with it."

The Raven is renowned for its small size which allows Soldiers to carry it into the field without encumbering its bearers. According to Matney, the total system weighs about 40 lbs. with the UAV proper weighing about 4 lbs.

"It's modular," Matney. "You can distribute the system throughout the squad which minimizes the amount of weight each Joe has to carry."

Such modularity makes the Raven ideally suited for Afghanistan's more rugged areas, Baird said.

"If there are Taliban up in the mountains, we can use the Raven to fly ahead to determine where they are (hiding). The Raven allows us to see where Taliban are suspected to be instead of sending guys up the mountain only to find nothing and be exhausted (from hiking in full gear)."

Getting the drop on enemies helps save lives, Matney said.

"The last time I was in Iraq," Baird said, "My FOB (Forward Operating Base) was receiving mortar fire and we sent the Raven out to find their position. The Raven found where they were. We sent out some guys. They ended capturing twelve guys and stopping them from hurting anyone."

Another advantage of the Raven's diminutive size is its stealth capabilities. The Raven is pretty small, doesn't make much noise and its coloring make it difficult to find in flight, Baird said.

"It is definitely fun to fly," said Baird, "but the more important thing is knowing that I am contributing many different ways with the Raven. I am proud to be able to serve my country."
SPC Derek L. Kuhn, 40th Public Affairs Detachment - Reprinted from "The Mountain Warrior"

ChemRaven Test & Demo

A new Raven equipped with a Chemical Sensor Module took flight over Dugway Proving Ground, Utah in July successfully detecting both methyl salicylate (mustard gas) and Triethyl phosphate (nerve agent) stimulants. This test was followed by a demonstration to a group of VIPs, including BG Jess A. Scarbrough (shown left), Program Executive Officer for Chemical and Biological Defense.

Also tested was a newly developed autonomy tracking algorithm. This new algorithm enabled the Air Vehicle (AV) to track the plume in 3D, defining the width, downwind extent, and top of the plume. The operational team was able to set the "autonomy safety settings" via FalconView™ mapping software. Additionally, a manual search area could also be commanded in FalconView.

New to the Chemical Biological Detection and Early Warning System effort was the fusion of data from an array of ground sensors and air vehicle sensors into one collocated command site. The data fusion allowed the operator to either autonomously or manually command the plume search and designate strong sensor detections to queue remaining sensors for plume verification. The ChemRaven flight path, in congress with this system, could also be queued by the fusion operators and directed to fly toward the area of detection.
Ken Fidler, Small UAS Team, Aviation and Missile Research, Development and Engineering Center

Digital Data Link Arrives

The Small UAS (SUAS) Product Office is moving forward with conversion of the Raven fleet to a new digital data link (DDL). The prime vendor for the DDL Raven system, AeroVironment, Inc. of Simi Valley, Calif., is currently reviewing the performance of the link and assessing training packages to support the new hardware.

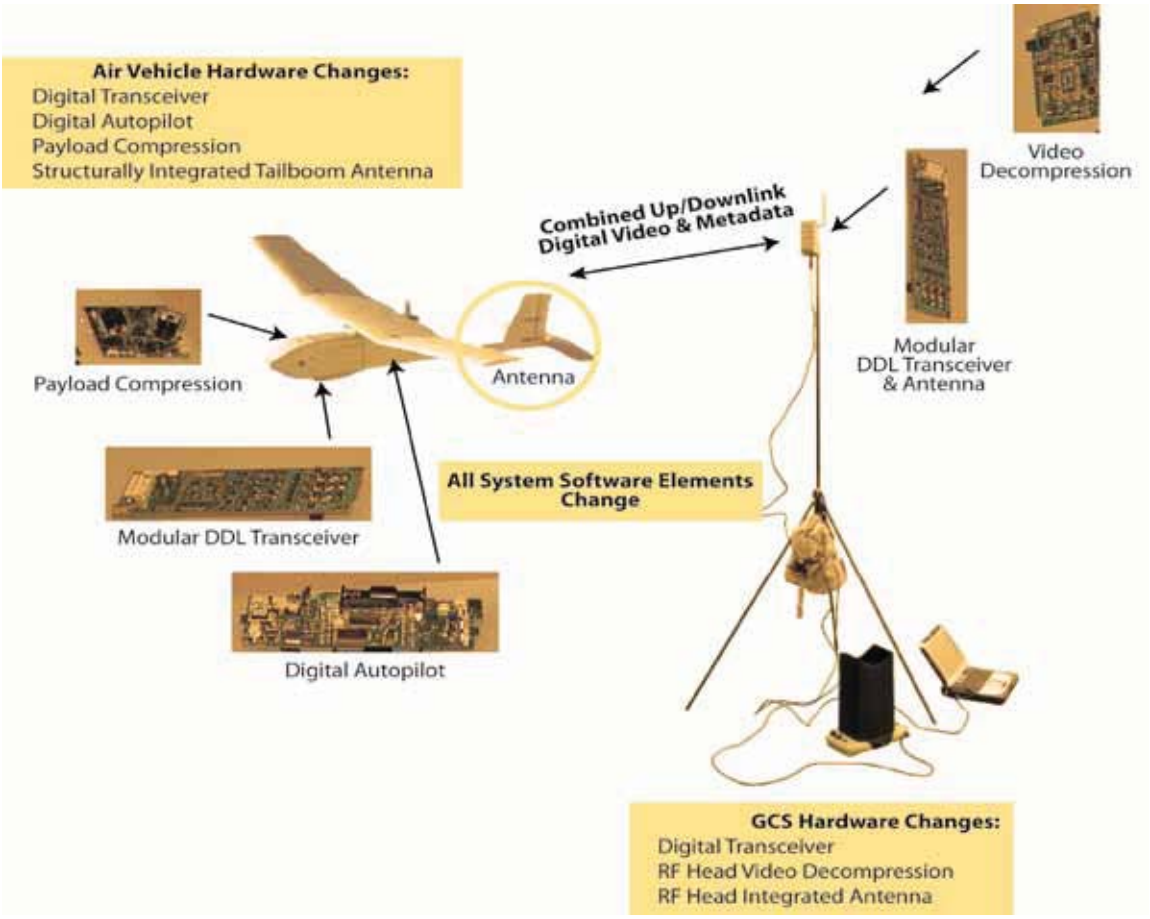
The first units to receive training on the new DDL Raven will be Military Police companies from across the nation. Training for those units began in November 2009. Fielding of DDL equipped Raven systems kicked off with those same units in December and fielding will continue at a rate of approximately three brigades per month according to the Department of the Army schedule. Teams from the SUAS Product Office will deliver conversion hardware for units currently equipped with the analog eight-channel Raven systems on a schedule beginning in CY 2010.

The DDL offers significant advantages over the previous analog versions of Raven. The most important benefit is the ability to fly multiple Raven aircraft in an operational area. More efficient use of the spectrum assigned for Raven operations and the ability to lock specific aircraft to specific ground control stations allows up to 16 aircraft to operate in an assigned area. Previously, frequency allocations limited units to four Ravens in an area. The use of Internet Protocol (IP) in the command and control link will allow two Raven aircraft to be deployed in a relay configuration, extending the range of the "mission" aircraft significantly. A voice-over-IP capability will be incorporated soon.

Other enhancements will be fielded during the conversion to DDL. The daylight payload will be upgraded from a 3 megapixel color camera to a five megapixel high-resolution digital camera with improved stabilization. The system will also offer an additional level of zoom, known as "ultra-zoom." The Raven motor will be upgraded to a higher efficiency model offering more power than the previous motor. Combined with a new, longer propeller, operations at higher altitudes will be enhanced. The GPS antenna will incorporate both L1 and L2 bands for improved GPS accuracy. Incorporation of a three-axis magnetometer will improve heading and azimuth accuracy. An aircraft tracker will be integrated to replace the auxiliary "bird-tracker" previously used to locate downed aircraft. Operators may select an automatic tracker function or manually turn the tracker on or off. Additionally, the FalconView™ tool bar, AV Screener, and system simulator will also be improved.

Other unmanned systems will also incorporate DDL. Honeywell, manufacturer of the gMAV and Class I, is working on integrating the DDL as the primary data link.

The Small UAS Product Team, UAS P.O.



Raven Sets Flight Record

Move over 100 minutes because 120 minutes now stands as the new flight time record for a Raven Small Unmanned Aircraft System (SUAS). This is the direct result of a higher capacity air vehicle (AV) battery pack and a new lighter airframe. The SUAS Laboratory conducted flight tests on the new system in a parallel development and test effort for the Digital Data Link Raven System upgrade.

The new airframe manufactured by AeroVironment, Inc. now includes the gray paint mixed directly in the structure matrix eliminating the steps taken to paint the parts which reduces the weight of the airframe, called Raven-Lite, by 70 grams.

In May 2009, the SUAS Laboratory conducted an endurance test with both a Full Rate Production (FRP) Raven AV and a Raven-Lite. The FRP AV was launched first and commanded to climb to 520 feet Above Ground Level (AGL) while flying a 3-kilometer long by 500 meter wide Diamond Default pattern. Five minutes later, the Raven-Lite was launched, climbed to 500 feet AGL and flew the same Diamond pattern. The flight for the FRP AV lasted for 114 minutes, breaking the old record by four minutes, but the Raven-Lite achieved 120 minutes. This record was matched in July with a FRP Raven AV using the higher capacity battery pack.

Lebanese Soldiers Train

A Letter of Offer and Acceptance (LOA) was implemented in March 2009 with the Lebanese Air Force (LAF) for the acquisition of four RQ-11B Raven systems. Although normal procurement lead times for the Raven through Foreign Military Sales (FMS) is 11 months, the LAF received their Raven systems 58 days after LOA implementation.

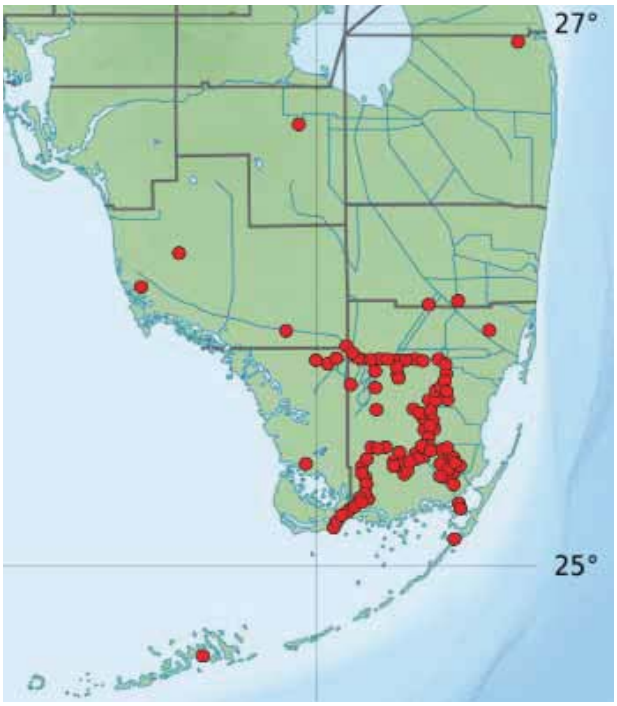
The Raven systems delivered to the LAF are considered a critical piece to a comprehensive robust Department of Defense military assistance program. The Ravens strengthen the LAF's ability to defend Lebanon's borders, maintain internal security, fight terrorism and implement United Nations Security Council Resolution 1701, which ended the 2006 Hezbollah-Israeli war in Southern Lebanon.

The program from day one had Congressional, Secretary of Defense, and General Officer level leadership interest across various commands. There was absolutely no room for error or schedule slip in order to complete training and the delivering the systems to Lebanon by the desired date. The Small Unmanned Aircraft Systems Product Office, the Acquisition Center, the U.S. Army Aviation and Missile Command (AMCOM) legal team, AMCOM's Security Assistance Management Directorate, prime contractor AeroVironment, Inc., and the Unmanned Aircraft Systems Project Office's Business Management and FMS personnel coordinated daily on issues and addressed critical program milestones to mitigate program risks and expedite delivery.

The Lebanese Raven program is a great example of various organizations pulling together to achieve a common goal. This remarkable team effort exceeded all expectations to support U.S. Policy and the LAF in their efforts to safeguard the peace, unity, and sovereignty of Lebanon. ***Steven Moore, Director, Foreign Military Sales, UAS P.O.***

Python Recon in Everglades

Looking for Burmese pythons might not be among the top things you would do if you had a Raven small unmanned aircraft system, but the Raven is proving to be the right tool for finding these snakes in the Florida Everglades. The south Florida ecosystem has been negatively impacted by years of unauthorized release of these household pets and their subsequent breeding. Until now the interactions have primarily been on the main park roads or levees, which are indicated below with the red dots. In September 2009,



various thermal sensors were tested for the ability to locate the pythons by mounting a Raven on a man lift. If Federal Aviation Administration permission is obtained, the next phase of test plans for flying Raven is to search for Pythons.

Images Intensified

The Small UAS (SUAS) Lab recently evaluated a new camera payload designed to work in both day and night conditions. The payload is equipped with an Image Intensified (I^2) camera, an Electro Optical (EO) camera adjusted closer to the Infrared (IR) spectrum. The tests involved finding the weight, power consumption, and camera performance of the I^2 payload compared with a Full Rate Production (FRP) IR Thermal Side Look Payload and a FRP EO Payload.

The I^2 payload houses an Intevac E3010 Low Level Camera with a spectral response range of 500-900 nm and an output resolution of 1280x1024 at 30 frames per second (fps). The camera features non-uniformity correction, bad pixel replacement, histogram equalization, extended dynamic range, scintillation filtering, automatic gain control, day/night operation, and horizontal image orientation.

Daytime flight tests determined a focal point for clear video at both a normal and zoomed setting, at an Air Vehicle operational altitude ranging from 400 to 1,000 feet Above Ground Level. Zoom commanded below 400 feet degraded video resolution. Several conclusions were made during twilight and nighttime flight tests. The I^2 camera works well for twilight conditions; much better than either the FRP EO or IR payload. At minimal light conditions with no moonlight, it performed similarly to the FRP EO camera at night. Intevac provided new hardware to the SUAS Laboratory which should enable enhanced day and night condition performance. Flight tests will continue with the new hardware.

Based on test-related data, the increased weight of the I^2 payload did not affect flight performance nor should the slight increase in power consumption affect flight endurance.

Ken Fidler and Daniel Hiatt, Small UAS Team, Aviation and Missile Research, Development and Engineering Center

The Small UAS Lab team evaluates an Intevac E3010 Low Level Camera on a Raven, checking visual performance at various light conditions both daytime and nighttime.

Top to bottom: U.S. Army SPC Corey Weinheimer operates a Raven during a joint U.S.-Iraq air assault operation to search for weapons and insurgent activity; U.S. Army SPC David Brown helps Iraqi police manage surveillance activities along the Euphrates River as a new highway bridge, designed to help stimulate the area's economy, is built; and U.S. Marine Lance Cpl. Samuel Kautz performs pre-flight checks at a Combat Outpost.

OSRVT Expands Capabilities:

2,000+ UNITS NOW AIDING SOLDIERS

In the first quarter of FY 2010, the One System® Remote Video Terminal (OSRVT) will expand its capability throughout Iraq, Afghanistan, and in all of the Combat Training Centers for deploying Soldiers. New platform integration, encryption and production milestones came to fruition since last summer.

Team OSRVT supported integration into multiple platforms and OSRVT is now compatible with the Sky Warrior QRC in theater and the new Hunter frequencies that will soon be in theater, and is conducting several demonstrations on platforms that will yield greater capabilities in the near future.

Following the initial Sky Warrior QRC fielding, Common Systems Integration Product Office (CSI PdO) addressed Soldier feedback regarding improving range Full Motion Video (FMV) clarity on their OSRVTs by improving signal strength and video quality. The CSI PdO continues to address the remaining Soldier-identified issues to maximize system performance. Soldier feedback enhances our product and the situational awareness of the Combat Aviation Brigade commander and the commanders and Soldiers thousands of feet below as they accomplish their assigned missions. User feedback provides paramount data to meet requirements and in turn, CSI PdO actively tests against Soldier's comments to deliver the best product.

CSI PdO personnel are also building profiles for new frequencies for Hunter and Raven and in the coming months, Soldiers will see that both Hunter and Raven systems will be using new frequencies. Team OSRVT coordinated with the respective platforms to ensure that quality video and metadata are provided to our Soldiers in theater. The end of 2009 marked the fielding of CSI PdO -11 software.

Perhaps the greatest gain in OSRVT integration, Manned Unmanned Teaming, Level of Interoperability-2 (MUMT-2) (the program formerly known as VUIT-2) on the AH-64s, is currently integrated into the OH-58 Fleet. The Aviation Applied Technology Directorate successfully demonstrated FMV and metadata on an OH-58D at Fort Eustis. In the coming year the Kiowa fleet will begin its conversion to become MUMT-2 capable. In addition to the OH-58 fleet, the AH-64 MUMT-2 battalion achieved such great operational success, additional MUMT-2 capable Apaches will support both Operation Enduring Freedom (OEF) and Operation Iraqi Freedom.

Both AAI and CSI PdO are proud to announce the 2000th system has been deployed in support of OEF. Since initiating fielding in 2007, CSI PdO and AAI have now sent over 2000 OSRVTs and over 691 Mobile Directional Antenna Systems into the fight. Although we want to thank everyone for their tremendous efforts, this team knows that our charge is to maintain our place as the lead in FMV and metadata dissemination on the battlefield. CSI PdO's primary goal is to press forward with product development and improvements to ensure that our Soldiers have real-time situational awareness both on the ground and in the skies while confronting our nation's enemies.

LTC Jennifer Jensen, Product Manger, Common Systems Integration, UAS P.O. and MAJ Jason Ross, Commons Systems Integration, UAS P.O.

One System® Remote Video Terminal features new encryption and is now integrated with more platforms, including the Shadow® tactical UAS shown above at Forward Operating Base in Iraq. U.S. Army SPC Christopher Ellis conducts a radio check as he prepares to launch a Shadow.

Can't Get This in a Book

About six months ago, while working for Systems Products and Solutions on the One System® Remote Video Terminal (OSRVT) fielding team, I looked at a large stack of black cases and thought "who will field all these systems?" I was hoping to get a couple of pack mules, and then it hit me, I am the mule! The 63 pound OSRVT cases are still stacked up in a dusty tent at the Forward Repair Area in Iraq. Our group is in charge of issuing, fielding, and training military personnel on the OSRVT and Multi-Directional Antenna System throughout Iraq and Afghanistan. Fortunately, AAI Corporation employees assisted with the delivery. Over many months, we issued hundreds of OSRVT systems and trained nearly 400 Soldiers, Airmen, Sailors, and Marines in the most austere regions of the world. And this was just the very beginning of the surge for Intelligence, Surveillance and Reconnaisance assets.

The volume of systems is daunting, especially when it is over 120 degrees in the shade. Every time we pull a pallet another comes in. However, the exhaustion melts away when I go to the Soldier's site and meet the customers from all walks of life. The classes typically start the same: we guzzle coffee and exchange stories about home or our new definitions of comfort. Many students have no idea why they are there for training, but once I start, they scoot up on their seats and refill their coffee...this is not just another training, but a tool that changes the art of war.

The "ah-ha" moments happen for Soldiers when trainers talk about digital recording and target calculation features, especially for those who normally can't see unmanned video when they are on a mission. The most incredible feature of the OSRVT is shortening the communication time to milliseconds. Speaking, hearing, and comprehending what one Soldier sees on the other end of a radio can cause serious delays while speeding down the road, like a GPS announcing a turn after passing the street. Missing a street in a war zone could be catastrophic rather than inconvenient.

The convenient technology that we take advantage of in the States is missed in war zones. Live video, cell phones, Tivo™, are sometimes a dream, but placing an OSRVT in the hands of a Soldier is closing the gap. The lack of communication can be aggravating, even petrifying, when surrounded by enemy forces. A life-threatening situation is hard to explain and must be experienced to "get it". The initiative the Army is taking to get the OSRVT out to the Forward Operating Bases is proof of understanding the OSRVT operator's needs. Highlighting a feature of the OSRVT/UAS capabilities or spending extra time training can make or break the concept.

Not all training happens in an ideal setting. Sometimes trainers are on the front lines with the Soldiers. Our favorite moments are when we see appreciation on the faces of our new brothers-in-arms when we do something like throw on a pair of gloves and charge up a three story ladder to troubleshoot their system. We are willing to go wherever they go to get the job done.

Having personally experienced what many combat Soldiers, Marines, Sailors, and Airmen endure - including water bottle showers, sand fleas, and hard sleeping cots - I can tailor my training to them. And it is the best feeling in the world to know that this training and this tool can help save lives.

Tarah Hollingsworth / CAS/ITT, Resource Center, UAS P.O.

U.S. Army Acquisition Corps Awards 2009

The Unmanned Aircraft Systems (UAS) Project Office's Common Systems Integration Product Office received the Excellence Award in the Information Enabled Army category. Congratulations, too, to other UAS Project Office nominees: Mr. Ron Smith (Life Cycle Logistician of the Year) and the Contracting Process Improvement team.

Left to right: Mr. Tim Owings, LTC Jennifer Jensen, Mr. Ed Gozdur, BG William T. Crosby.

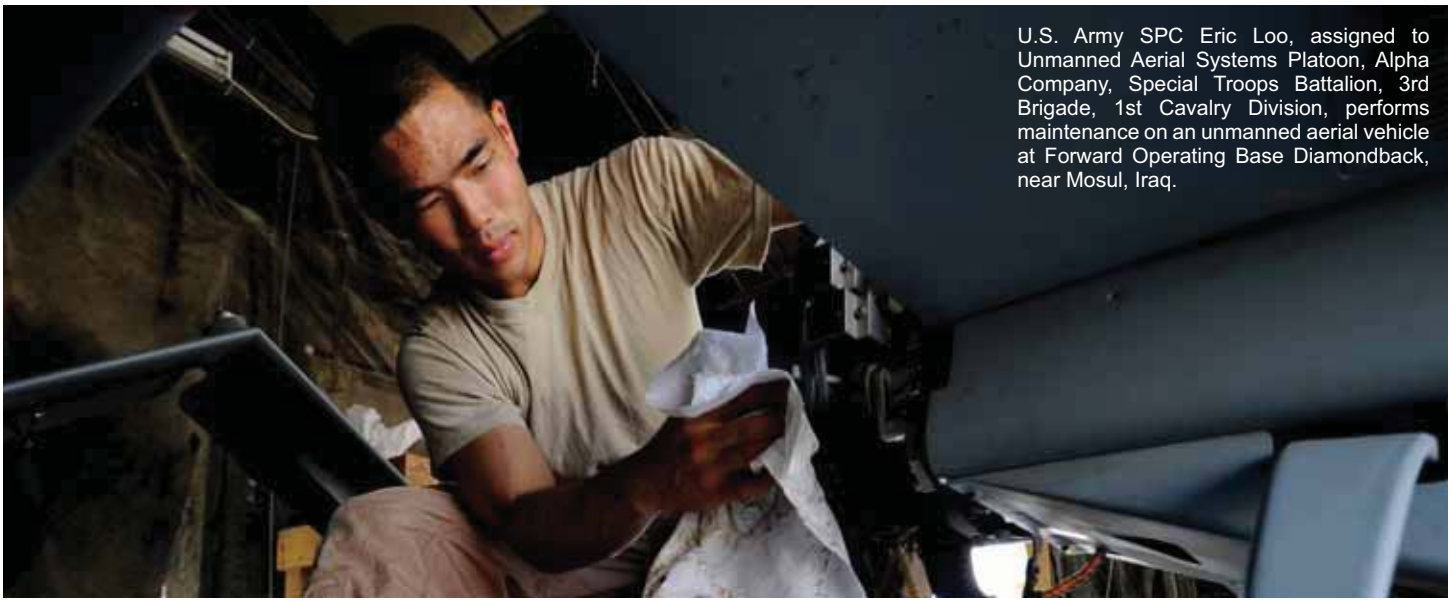
Left to right: Ms. Paula Yates, Ms. Brenda Matthews, LTC Jennifer Jensen, and Mr. Ed Gozdur.

C4ISR Journal Awards 2009

Congratulations to both Shadow and VUIT-2 who were BIG 25 Award winners in C4ISR Journal's annual awards event. VUIT-2 went on to be named to the BIG 5 for 2009.

Each year, C4ISR Journal scours the intelligence community for the projects, innovations and organizations that the editors believe are making the biggest difference in the world of intelligence.

Apache helicopter gunner's view shows UAS map feed on the right screen during manned-unmanned teaming.



U.S. Army SPC Eric Loo, assigned to Unmanned Aerial Systems Platoon, Alpha Company, Special Troops Battalion, 3rd Brigade, 1st Cavalry Division, performs maintenance on an unmanned aerial vehicle at Forward Operating Base Diamondback, near Mosul, Iraq.

AAAA UAS Soldier & Unit of the Year 2009

The UAS Soldier and Unit of the Year were awarded Dec. 10, 2009 by the Army Aviation Association of America (AAAA) during their annual UAS Symposium. The UAS Soldier of the Year is SGT Jimmy Marayag with Company B, 4th Brigade Special Troops Battalion, 4th Bde. Combat Team of the 101st Airborne Division (Air Assault), Fort Campbell, Ky. The UAS Unit of the Year is Troop A, Task Force ODIN-Iraq, previously assigned to Contingency Operating Base Speicher near Tikrit, Iraq. The commander of Troop A is CPT Michael J. Goodenough and the senior non-commissioned officer is 1st SGT Kahrim G. Singleton.

SGT Jimmy Marayag receives the UAS Soldier of the Year award. Left to right: CSM Tod Glidewell, USAACE Fort Rucker; Mr. Frank Pace, executive vice president, General Atomics-Aeronautical Systems Inc.; MG William O. Barclay, Commander, Fort Rucker; SGT Marayag; Mr. Tim Owings, Deputy Project Manager, UAS.

Representatives of the UAS Unit of the Year receive their award. Left to right: CSM Tod Glidewell, USAACE, Fort Rucker; Mr. Russ Walker, division vice president, TUAS, AAI Corp.; MG William O. Barclay, Commander, Fort Rucker; 1SG Kahrim G. Singleton; CPT Michael J. Goodenough; Mr. Tim Owings, Deputy Project Manager, UAS.


UNMANNED
U.S. Army
AIRCRAFT SYSTEMS
Hunter
ERMP
RAVEN
Class I
Class IV
Shadow