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## ARMOR & MOBILITY



## **U.S. SOF: BUILDING AN ENDURING ADVANTAGE**

U.S. Special Operations Command, MacDill Air Force Base, Tampa, FL, is re-investing in capabilities for operating in contested environments such as dry combat submersible, counter-unmanned aerial, and mission command to achieve next-level overmatch. By Jim Smith

## Features



#### TRANSFORMING WARRIOR EVOLUTION

**COL Anh Ha Program Executive Officer SOF Warrior U.S. Special Operations Command** 

## Departments



Insights



Advertisers Index/ **Calendar of Events** 



#### PROMOTING AUTOMATION AND MOBILITY

Col. Ken Kuebler **Program Executive Officer Fixed Wina U.S. Special Operations Command** 



#### **INDUSTRY PARTNER**

**Rugged Mobile Power Solutions** LIND Electronics, industry specialist in mobile power technology development, brings innovation and reliability to a precision market. **By Daniel Little** 



#### OPTIMIZING LETHALITY AND SURVIVABILITY

Mr. Geoffrey R. Downer **Program Executive Officer** Rotary Wing U.S. Special Operations Command



#### **Augmenting Lethal Reach Down Range**

The U.S. Army is testing its Extended Range Cannon Artillery (ERCA) Soldier touchpoint to put more command and control in targeted fire control. By Mark Schauer



#### ACHIEVING INFORMATION DOMINANCE

**COL Reah M. Pritchett** Program Executive Officer **SOF Digital Applications U.S. Special Operations Command** 



**Promoting Common Access to Mission-Critical Knowledge** The Defense Logistics Agency is working to develop common technology and standards for enhanced processes in additive manufacturing. By Beth Reece



#### TRANSPORTING MISSION PAYLOAD

Lt. Col. Alfredo Romero **Program Manager** Family of Special Operations Vehicles **U.S. Special Operations Command** 

**Cover:** U.S. Army Soldiers carry a rope used for fast roping as they walk to a CV-22 Osprey from the 8th Special Operations Squadron. Fast roping is used to infiltrate ground forces and it allows the aircraft to stay airborne.



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## **INSIGHTS**

The fact remains that much of the danger that threatens American national security comes from nationally unrepresented entities such as non-state-sponsored terror organizations. The fact also remains that those who protect our way of life as Americans do that protecting from beyond our eyes to ensure they stay beyond the eyes of those who would do us harm. They are our "Silent Professionals" and they are alive and well, though for our sake and theirs, the less we know of their work, the safer they keep us.

The annual Special Operations Forces (SOF) edition of Armor & Mobility takes us into a world that targets threats with an undefined footprint but that are just as deadly to our nation's interests as any state-backed missile strike. Leading off the issue, we get right into the capabilities and programs that drive the U.S. Special Operations Command (USSOCOM) mission. In an exclusive from the office of USSOCOM's Acquisition Executive James Smith, a command-wide Armed Overwatch focused re-investment in what enables SOF to counter violent extremists in contested environments from mission command to unmanned air to the maritime domain is well underway.

Dovetailing directly into a series of interviews with the Program Executive Offices (PEOs) that support the SOF mission, we start where the SOF mission begins and ends: the skilled Operator. PEO SOF Warrior COL Anh Ha shares his insight into experimentation and research priorities from Lightweight Medium Machinegun (LMG-M) fielding to the state of evolution of USSOCOM's touted Hyper-Enabled Operator (HEO) program. From dismounted to mounted, responsibility for USSOCOM's array of ground platform mobility applications is handled squarely by Program Manager for Family of Special Operations Vehicles (FOSOV) Lt. Col. Alfredo Romero who speaks to the evolution of Ground Mobility Vehicle 1.0 to 1.1, Light Tactical All-Terrain Vehicle (LTATV) performance testing of Increment II two and four seat variants, as well as the state of RG-33 Mine Resistant All Purpose (MRAP) Vehicle and SOF-specific Mine Resistant All Terrain Vehicle (M-ATV) development.

From the air, we get a look at current and forward-looking efforts by both PEO Fixed Wing (FW) and PEO Rotary Wing (RW) and ways USSOCOM is modernizing Crisis Response capabilities to sustain high-level Counter-Violent Extremist Organization (C-VEO) operational tempo. From MC-130 maritime operations to MH-47G Block II enhancements, aerial SOF remains critical to the overall SOF mission set. With today's approach to holistic national security as critical to platforms as information, PEO SOF Digital Applications (SDA) COL Rhea Pritchett is on the front lines of proactive defense. From software and data capabilities covering the spectrum of mission planning, public/non-public/commercial data, intelligence, and command and control enabling mission command, PEO SDA is taking the cyber fight to the enemy.

Be sure not to miss features on the Army's testing of Extended Range Cannon Artillery (ERCA) precision fire control software as well as the Defense Logistics Agency's push to leverage technology in the use of additive manufacturing (AM) capabilities across a common data architecture.

As always, we welcome any comments and thank you for the continued readership!

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# SOCOM AT&L REPOSITIONING WITH ADVANCES IN MOBILITY MODERNIZATION U.S. SOF: BUILDING AN ENDURING ADVANTAGE

U.S. Special Operations Command is reinvesting in capabilities required for operating in contested environments, including such program areas as dry combat submersible, counter-unmanned aerial systems, and mission command systems.

By Jim Smith, Acquisition Executive, U.S. Special Operations Command





A West Coast-based Naval Special Warfare operator fast ropes from an MH-60 Blackhawk assigned to the 160th Special Operations Aviation Regiment "Night Stalkers" at Naval Outlying Landing Field Imperial Beach. Naval Special Warfare is the nation's premier maritime special operations force, uniquely positioned to extend the fleet's reach and deliver all-domain options for naval and joint force commanders. (U.S. Navy Photo by Mass Communication Specialist 1st Class Daniel Gaither)

Colin Powell famously said, "show me your budget and I'll tell you your strategy." An unmistakable sign of U.S. Special Operations Command's (USSOCOM's) commitment to modernization is the 20% increase in research and development funds from fiscal year 2023 to 2024 and that trend continues through 2028.

To make room for this modernization, in a flat budget environment, we're making the tough choices to reduce funding in some areas that have served us well in the past but may not be needed for campaigning left-of-conflict. For example, we're going to reduce the number of AC-130Js we procure. We are going to reduce contractor owned and operated airborne intelligence, surveillance, and reconnaissance. And we're going to reduce our ground vehicle fleet mainly for our Navy component as our SEALS return to competencies in the maritime domain.

#### **MAINTAINING AN OPERATOR-CENTRIC FORCE**

Armed Overwatch is the outlier as it represents USSOCOM's continued investment in counter-violent extremist organization operations as our unique contribution to the national defense strategy. These heavily armed, resilient, and sustainable airplanes, with highly adaptable stateof-the-art sensor suites, will provide direct support to our ground SOF operating in permissive environments. Their availability to SOF will free up next generation aircraft for Joint Force operations in more contested environments. We expect to begin operational testing in FY24.

Our biggest investments are in the maritime domain with a focused effort on maritime mobility modernization. Our wet and dry combat submersibles will provide our SEALS with safe and reliable access. Our current dry combat submersible program successfully completed operational testing and will be fielded early this summer. We're also grateful to the multiple industry partners who have teamed with us in the development of a competitive acquisition strategy for a follow-on capability. In addition to the significant progress made in submersible modernization, we're hyper-enabling the Combat Diver with leading edge propulsion, navigation, communication, and environmental protection technologies. Across the surface fleet we are integrating interoperability and lethality systems into our exquisite Combatant Craft.

As we're learning from ongoing operations both in Ukraine and

#### SOCOM AT&L REPOSITIONING WITH ADVANCES IN MOBILITY MODERNIZATION



U.S. Soldiers exit from the ramp of a U.S. Airforce Lockheed C-130 Hercules aircraft during an Airborne operations parachute jump near Stuttgart. Led by jumpmasters from Special Operations Command Africa, airborne operations like these help personnel maintain proficiency and increase a unit's readiness for expeditionary deployments. (U.S. Army photo by Visual Information Specialist Jason Johnston)

the Middle East, we're going to need effective counter-unmanned aerial systems. Our approach to Counter-Unmanned Air Systems (C-UAS) is software-defined/hardware-enabled. We're teamed with a systems integration partner that ensures we have an open software architecture to allow multiple, best-in-breed, detect sensors and defeat mechanisms that can provide an expeditionary, end-to-end system for our small-unit SOF formations and their partners. Our program office for C-UAS holds every-other-month sessions to review proposals from industry for integration into our system architecture.

#### PUSHING GREATER COMMAND AND CONTROL AFIELD

Our Mission Command System (MCS) program of record is probably the most emblematic of how we are evolving towards competing left-of-conflict. While mission command systems in the past mainly focused on kinetic operations by displaying items such as range rings and no fire areas, we are developing a mission command system for our commanders to be able to command and control their campaigns. MCS is breaking ground for USSOCOM by mastering agile software acquisition practices through the software acquisition pathway. We're committed to an open-architecture ecosystem approach that will be interoperable in any Joint All Domain Command and Control (JADC2) environment. Currently, we have approximately 17+ industry partners in our ecosystem contributing to MCS and plan to deploy the latest version to each of our theater special operations commands by October 2024.

As we complete and field these capabilities to SOF, we are applying research and development funds to the key challenges that we recognize USSOCOM will need to contribute to the Joint Force. These five technology challenges are communications in a contested environment, collaborative autonomy of uncrewed systems, nextgeneration Intelligence, Surveillance and Reconnaissance (ISR), untethered logistics, and next generation mobility. A common thread through each of these is the need for a digital architecture and software-first approach to enable a true data-informed environment for our Operators.

## CONTINUED INVESTMENT IN COMMS AND CYBER DEFENSE

One of the greatest technical challenges facing SOF during operations with partners in contested environments is resilient communications. First, these communications need to have a low probability of detection or interception. In the presence of persistent jamming, they must allow our Operators and our crewed and uncrewed platforms to transmit and receive critical information. Finally, we must be able communicate with the rest of the Joint Force as well as our partners and allies. In some cases, we'll want communications equipment that we can export to partners. Given the

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#### SOCOM AT&L REPOSITIONING WITH ADVANCES IN MOBILITY MODERNIZATION



U.S. Navy Special Warfare Combatant-Craft crewmen (SWCC) traverse through a lake on a Special Operations Craft-Riverine (SOC-R) during a training maneuver in support of exercise Arctic Edge 2022 in Juneau, Alaska. Arctic Edge is a U.S. Northern Command exercise hosted by Alaskan Command, where Special Operations Command North can demonstrate its special operations capabilities in the extreme cold. (U.S. Army Photo by Staff Sgt. Arnell Ord)

sophisticated electronic-warfare environment we're seeing in Ukraine and other areas, resilient communication in a contested environment is, in my opinion, our most pressing challenge to solve.

Communications in a contested environment will enable our next technology priority: collaborative autonomy. USSOCOM is investing in a system-of-systems architecture and uncrewed platform-level software and hardware that will enable our Operators to control multiple uncrewed platforms across the air, ground, surface, maritime, and subsurface domains to perform tactical missions autonomously. Our ability to achieve machine-to-machine collaboration will enable the sensor-to-shooter threads required to enable both organic SOF and Joint fires. But, left-of-conflict, we also need collaborative autonomy as one of the three legs of how we view next generation intelligence, surveillance, and reconnaissance.

The other two legs are space-based payloads and cyber-based ISR. USSOCOM will maintain organic capability for airborne ISR in permissive environments, but our next technology priority is providing ISR in contested environments. We are currently coordinating directly with the U.S. Space Force's Space Development Agency for the addition of SOF-peculiar payloads to their Tranche 1 and Tranche 2 LEO constellations. We also believe commercial space can provide relevant information that can feed into our third leg, cyber-based ISR. We want to be able to provide SOF formations with relevant, timely, and fused information from across multiple publicly available and open-source information sources. This information, provided to our

Commanders in a "single pane of glass," will displace the airborne ISR we've relied on for past conflicts and transition to the relevant, timely, and population-centric information required for campaigning.

#### GLOBAL PARTNERING FOR INFRASTRUCTURE DEVELOPMENT AND THREAT REDUCTION

As we focus on the INDOPACOM area, we note the fact that our SOF units will be operating alongside partners at great distances from traditional supply bases. In a contested environment, we need to provide them with food, water, repair parts, ammunition, and power without subjecting them, or supporting units, to the risks inherent from operating near potential adversaries. We would like to be able to generate these supplies at the edge to untether our SOF and their partners from traditional logistics to the maximum extent possible. We are exploring means to provide water, generate and store power, and additive manufacture parts and ammunition to small-unit formations operating far from supply bases – all packaged within a self-sustaining, energy neutral platform.

Of course, we will still require mobility platforms that can deliver our SOF and the supplies they'll need that can't be manufactured at the edge in this INDOPACOM environment. We are exploring several methods to decreasing our runway dependency. The first is exploring amphibious capabilities to include enabling our MC-130s to operate as float planes. If we can enable the MC-130 to land and

#### SOCOM AT&L REPOSITIONING WITH ADVANCES IN MOBILITY MODERNIZATION



Special Tactics Tactical Air Control Party operators conduct close air support training in Green Valley, Arizona. TACPs integrate air combat power and surface fires into the ground scheme of maneuver, enabling dynamic and lethal firepower on today's battlefield. (U.S. Air Force photo by Tech. Sgt. Carly Kavish)

take off anywhere there is water, we will greatly improve the ability to provide SOF with the mobility required for campaigning. The other technology we're exploring, in conjunction with DARPA, is High-Speed Vertical Take-Off and Landing aircraft. These HSVTOL aircraft will be able to fly much farther and faster than current lift to cover the vast distances encountered in INDOPACOM and can operate without dependency on an airfield.

#### A PERPETUAL COMMITMENT TO OPERATOR SUCCESS

The National Defense Strategy directs us to build an enduring advantage. For SOF, that enduring advantage will be achieved by providing our most important asset, our people, with the technology, equipment, and services they need to be successful. Our acquisition efforts are focused on providing that capability in a networkcentric, data-enabled architecture that enables the communications equipment, mobility platforms, ISR assets, and software programs to operate synergistically to provide an undeniable overmatch capability to prevent any future conflict. But if there is conflict, to ensure SOF prevails.

#### About the Author

James H. Smith, a member of the Senior Executive Service, is the Acquisition Executive for United States Special Operations Command (USSOCOM) at MacDill Air Force Base, Florida. He is responsible for all special operations forces acquisition, technology, and logistics.



## TRANSFORMING TO ENSURE FUTURE OVERMATCH

Colonel Anh H. Ha is the Program Executive Officer SOF Warrior. He is a native of Rogers, Arkansas, and was commissioned a Second Lieutenant in 1996 as part of the early commissioning program at the Marion Military Institute. He then completed his Bachelor of Fine Arts at Louisiana State University in 1999 and was activated into the Army as an Infantryman. In July 2008, he transitioned to the U.S. Army Acquisition Corps. COL Ha's most recently served as a Fellow with the U.S. Army's Training with Industry Program.

COL Ha has previously served as a Rifle Infantry Platoon Leader and then Company Executive Officer (XO) in 3-7 Infantry Battalion, 3rd Infantry Division, Fort Stewart, GA where he deployed to Kosovo in 2000. His next assignment was at Schofield Barracks, HI, with the 25th Infantry Division where he served as the General Staff 3-Plans Officer, the 2-35 Infantry Battalion Logistics Officer in Afghanistan 2004-2005, and the 2-35 Infantry Battalion Company Commander in Iraq in 2006-2008.

Upon transitioning to the U.S. Army Acquisition Corps; his other acquisition duties include Deputy Associate Director for TARDEC Quick Reaction Cell at Detroit Arsenal, MI. Assistant Product Manager for the Mine Resistant Ambush Protected (MRAP) All-Terrain Vehicle (M-ATV) in Detroit Arsenal and Afghanistan forward Operations in Kandahar, the MRAP Vehicle Department of the Army Systems Coordinator (DASC) in the Pentagon, Assistant Secretary of the Army (Acquisition, Logistics and Technology) (ASA(ALT) Forward Operations Director in Kuwait, XO to the ASA(ALT) Deputy for Acquisition and Systems Management (DASM), USSOCOM Program Manager for Counterproliferation at MacDill Air Force Base, XO for the ASA(ALT) Principal Military Deputy in the Pentagon, and XO for the Director of Supply Production, and Distribution for Operation Warp Speed in Washington DC.

COL Ha holds an Associate degree in Fine Arts from Marion Military Institute in Marion, AL; Bachelor of Arts Degree in English and double minor in Philosophy and Sociology from Louisiana State University A&M in Baton Rouge, LA; Masters of Business Administration in Acquisitions & Contract Management from Naval Postgraduate School in Monterey, CA; Masters of Strategic Studies from the U.S. Army War College in Carlisle Barrack, PA. His military education includes the Infantry Officer Basic and Advanced Courses, Combined Arms and Services Staff School, Anti-Armor Leaders Course, Advanced Nuclear Biological and Chemical Officer Course, Bradley Infantry Fighting Vehicle Commander Course, Acquisition Basic Qualification Course, Intermediate Qualification Course, Joint Professional Military Education Level I & II.

A&M spoke with COL Anh Ha, Program Executive Officer SOF Warrior, regarding current and ongoing efforts to provide the nation's SOF with mission focused, cutting edge capabilities.



## **COL Anh Ha**

Program Executive Officer Special Operations Forces (SOF) Warrior U.S. Special Operations Command

#### A&M: With global conflict deterrence today dependent on robust SOF, what are PEO SOF Warrior's primary mission focus areas for readiness?

**COL Ha:** Our experimentation and research have identified priority investment capabilities tied to USSOCOM Key Operational Problem sets. In this regard, PEO SOF Warrior is developing and testing combat materiel technology as a part of the command's catalyst to "transform". PEO SOF Warrior is driving development of tactical capabilities that will provide precision guided weapons from ground and maritime environments to achieve longer-range, multiple, over-the-horizon effects on high-value enemy assets. Our active programs of record include Ground Organic Precision Strike System and Maritime Precision Engagement.

A&M: From a firearms capability perspective including the Lightweight Medium Machinegun (LMG-M) and .338 Norma Magnum weapons, speak to their lethality and current projected fielding.

**COL Ha:** The .338 NM cartridge is comparable to standard issue .50 CAL for terminal effects at a smaller size and weight form factor

#### USSOCOM AT&L EQUIPPING THE GLOBAL SOF OPERATOR

with increased exterior ballistic performance. The LMG-M is currently under development and testing. We project an acquisition full-rate production decision FY25 and fielding to commence FY26.

# A&M: In terms of operator worn C4ISR, how does PEO SW see the evolution of SOCOM's Hyper-Enabled Operator (HEO) as inclusive without diminishment of operator combat capability?

**COL Ha:** Integrated vice hang-on is the operative desired end-state. By reducing weight and optimizing wearability, we increase an Operators ability to move and perceive his environment. Our HEO efforts focus on reducing cognitive load of the operator by offering functionality selection pull down menus that are tailored to the Operator's mission roles and the tactical scenarios they are confronted with. Allowing each operator to "select" desired information/menu will desensitize miscellaneous information not required by the operator in the moment. By presenting focused information, the operator is not distracted, and the direct result is improved operator performance on the battlefield. Shoot, move and communicate will always remain the focus of hyper-enabling the Operator. One dominant HEO Truth is not to degrade Communications or bog down the Operator with information that is not needed.

Artificial Intelligence supporting small unit maneuver example: in this case, multiple unmanned assets can be controlled through a common operator worn interface. The computers worn by the operator (and often integrated within the air or ground platforms themselves) use a complex form of pattern analysis we might call Machine Learning or Artificial Intelligence. AI in this example lessens the burden of an Operator having to control (steer) unmanned system. AI enables collision avoidance, pre-planned maneuvers, or software that allows a user to focus on other tasks than tele-operation of a system.

The HEO concept is also a catalyst to drive innovation for development and fielding of new, lighter weight sensors and edge computing to the Dismounted Operator. PEO-SW is pursuing power sources with increased energy density to integrate with current Special Operations Forces Personal Equipment Advanced Requirements (SPEAR) kit. This endeavors to reduce the physical burden through weight reduction as well as allowing Operators to worry less about battery life. As more systems come online into the HEO infrastructure, PEO-SW will guide developments to standard interfaces and standard USSOCOM preferred power sources to continue to bring a streamlined solution to Operators and give them maximum flexibility for configuring their kit.

#### A&M: As global climate extremes continue trends of unpredictability, what are some PEO SW focus areas for minimizing the unknown so operator can maneuver with less worry about weather?

**COL** Ha: Our Program Management Office for Survival, Support & Equipment Systems is focused on providing environmental protection to mitigates the impact of operating in inclement weather. By reducing bulk and weight we not only hyper-enable the operator but also reduce logistical burdens and challenges associated with managing operator load. Innovation is demonstrated with reduced need for operator to adjust gear or change layers to meet changing environmental conditions. In this case, we've developed a Military Alpine Recce System (MARS) -- a cold weather clothing system engineered to extend mission duration and operational reach using controlled air flow to manage moisture and heat. By tailoring air flow,



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Elite military special operations forces including U.S. Naval Special Warfare employ rigid-hull inflatable boat teams in simulated rapid response to the hijacking of a tanker. The simulated air and sea-borne rapid insertion involves search and seizure of the occupied tanker and the safe release of the tanker crewmen. The exercise tests tactical skills and abilities to operate cohesively in a Joint operational mission. (Photo by Master Sqt. Timothy Lawn, U.S. Army Central)

the system achieves a balance of regulating body temperature and protection from the elements in both static and varying levels of physical activity allowing a more controlled microclimate. By utilizing an active layer technology, excess heat, and moisture during periods of medium to high exertion occurs thereby preventing overheating and moisture saturation.

Our Program Management Office, Family of Special Operations Vehicles (FOSOV) is continuing to study, develop and test solutions that provide ground mobility options for operating in an Arctic environment. Several ground mobility evaluations and operator test events have been conducted in Arctic Environments. Acquisition efforts to date have focused on providing Arctic mobility solutions for the Ground Mobility Vehicle (GMV) 1.1, Lightweight Tactical All-Terrain Vehicle (LTATV) and Non-Standard Commercial Vehicles (NSCV). Modified, Commercial Off-the-Shelf (COTS) solutions have been utilized to provide a significant increase in mobility for Arctic Conditions and virgin snow. Environmental impacts are also taken into consideration with Cold Weather kits that allow vehicle starts and



continued operations to occur in severe Arctic extreme temperatures, as well as enclosure kits to allow open cabs vehicles to provide a climatecontrolled cabin for operating in Arctic Environments.

#### A&M: What do you see as challenges/goals moving forward?

COL Ha: Special Operations Forces (SOF) are planning for and continuing to encounter complex and evolving threats across a wide spectrum of military operations as defined in the National Defense Strategy. These threats are ever present and growing within the unmanned systems, maritime, ground and air domains. USSOCOM research and development activities are making advances to counter such threats with solutionsets requiring more inherent autonomous, force protection capabilities that are proving to reduce the SOF Operator cognitive burden, while still providing the ability to detect, identify, and defeat these types of threats exponentially faster with increased precision. USSOCOM remains sensor and effector agnostic in its approach to the Counter Unmanned Systems missions.



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#### USSOCOM AT&L PROMOTING AUTOMATION AND MOBILITY

## BOOSTING SYSTEMS RESILIENCY TO ENSURE THREAT READINESS

Colonel Kenneth P. "Ken" Kuebler is currently serving as the Program Executive Officer (PEO) for Fixed Wing Programs, HQ U.S. Special Operations Command (USSOCOM), MacDill AFB, FL. He is responsible for developing, producing, testing, modifying, fielding, and supporting Special Operations Forces (SOF)-unique fixed wing aircraft and sub-systems, equating to over 100 programs and projects worth \$1.7 billion in 2017. SOF aviation capabilities include AC-130 and MC-130 variants, MQ-1C, MQ-9, CV-22, U-28, MC-12, C-145, C-146, other remotely piloted vehicles and precision guided munitions.

Col. Kuebler received his commission from the United States Air Force Officer Training School in July 1998 as a distinguished graduate. He has held a number of Air Force space and weapon system acquisition and operational positions, and positions on wing, Air Staff, Headquarters U.S. Special Operations Command, and the Joint Staff staffs.

Prior to his current assignment, Col. Kuebler excelled as the Director of the Air Force Portfolio Division at the Defense Contract Management Agency (DCMA) in Crystal City, Virginia. He is the Air Force's advocate and single point-of entry into the DCMA Enterprise covering more than 48,000 contracts, 43 Air Force Acquisition Category I & II Programs valued at more than \$2 trillion supporting Total Life Cycle Systems Management. Colonel Kuebler leads and coordinates the flow of information between the DCMA Enterprise and Senior Officials within the Office of the Secretary of Defense, the Service Acquisition Executives, Program Executive Offices, Designated Acquisition Officials, and Program Managers.

Armor & Mobility spoke recently with Col. Ken Kuebler, Program Executive Officer for Fixed Wing Programs, U.S. Special Operations Command, regarding current and ongoing priorities in enhancing modular open systems architecture and survivability resiliency in SOF next-generation and legacy capabilities.

## A&M: With global conflict deterrence dependent on robust SOF air presence, what are PEO FW's primary mission focus areas?

**Col. Kuebler:** PEO FW's focus always has been, and always will be providing our SOF operators with the Fixed Wing capabilities they need, when they need it, to deter and defeat our enemies and keep them, our international partners, and our nation safe and free. Following twenty years of capability development that emphasized Counter-Violent Extremist Organization (C-VEO) objectives, the Command and PEO FW are focused on those capabilities that increase SOF's capacity to Campaign in Strategic Competition, modernize Crisis Response capabilities in contested environments, and modernize and balance



**Col. Kenneth Kuebler** Program Executive Officer Fixed Wing U.S. Special Operations Command

sustainable, cost-effective C-VEO capabilities. To outpace adversaries, we are shifting our resources toward modernization while divesting of legacy systems and capabilities where prudent. For instance, Research, Development, Test & Evaluation (RDT&E) funds comprise 22% of our FY24 budget request as compared to 8% in the current year. Our focus is on developing multi-domain collaborative/autonomous solutions and Next-Generation Mobility capabilities that support campaigning in ways that complicate and compromise adversary actions and decision-making. To accomplish this, we continue to emphasize the use of Modular Open Systems Approach architectures, automation, and Artificial Intelligence/Machine Learning to reduce crew workload and make the operator more efficient, and the survivability and cyber resiliency of our systems. In these ways we will provide SOF with the robust, multi-capable air fleet needed to support the National Defense Strategy in the years to come.

A&M: Speak to PEO FW's C-130J current and future upgrades in terms of how modern development processes are being leveraged to increase mission effectiveness and survivability. What is the state of the maritime land and launch concept, as well as high energy laser?

#### USSOCOM AT&L PROMOTING AUTOMATION AND MOBILITY



An MC-130J Commando II sits on the flightline, June 24, 2022, at Columbus Air Force Base, Miss. The MC-130J is replacing the aging SOF fleet of 57 MC-130E, H, and P aircraft. (U.S. Air Force photo by Staff Sgt. Jake Jacobsen) (Portions of this image were masked for security reasons)

**Col. Kuebler:** PEO FW is aggressively developing and implementing technologies that increased the survivability of the SOF C-130J fleet in contested environments. These efforts include advanced Defensive Systems, a modern Radio Frequency Countermeasure capability, new radars that provide an improved Terrain Following/Terrain Avoidance system, and a modernized communications suite. To do so, the SOF C-130J fleets have transitioned to an agile hardware and software development approach which includes an Open Systems Architecture and has been used to synchronize efforts across 19 government and industry partners. The software development team is using common development tools to document, coordinate, prioritize, track, and execute program increments.

To be independent, PEO FW is developing and analyzing potential amphibious solutions that meet Special Operations Forces capability needs. This includes market research, capabilities assessments and vendor engagements. We are also performing design activities to design an amphibious capability on a MC-130J airframe. The effort includes engineering digital design and aerodynamic and hydrodynamic testing of designs through wind tunnel and tank testing.

The AC-130J High Energy Laser program continues to complete milestones with integrated weapon systems ground testing. Integration on the AC-130J and subsequent flight testing is scheduled to occur later this year.

#### A&M: What is the state of PEO FW's Armed Overwatch program in terms of deployment for support of austere operating, disaggregated SOF?

**Col. Kuebler:** After competitive prototyping, live flight demonstrations, and a rigorous source selection evaluation, USSOCOM selected L-3 Communications Integrated Systems to deliver a missionized strike platform based on the commercial AT-802U. L3's Armed Overwatch solution meets or exceeds all USSOCOM's key performance parameters,

including austere takeoff and landing, range and endurance, armament, sensors, defensive systems, secure communications, and modularity. The new aircraft, now designated the OA-1K, will provide costeffective close air support, precision strike, and armed intelligence surveillance and reconnaissance in support of disaggregated Special Operations Forces in austere environments. Low-rate initial production is underway on the first s OA-1Ks. Over the course of this year, USSOCOM will use the first three aircraft to certify the platform's airworthiness and to verify the integrated mission systems' functionality prior to proceeding into operational test next year. Because our acquisition approach included live flight prototype demonstrations, USSOCOM has already observed many of the OA-1K's capabilities. We look forward to qualifying the full suite of Armed Overwatch mission systems and fielding the most capable platform to safeguard our Special Operations Forces.

#### A&M: How is Terrain Following/Terrain Avoidance Silent Knight Radar system integration going on PEO-FW aircraft?

**Col. Kuebler:** Silent Knight Radar (SKR) was selected to fill a capability gap identified by Air Force Special Operations Command to provide a Low Probability of Intercept/ Low Probability of Detection Terrain Following/Terrain Avoidance solution to replace the aging AN/APQ 186

Multi Mode Radar on the CV-22 and add new capability to the MC-130J. Integration has been quite successful and development testing is nearing completion on both platforms. Both platforms are scheduled to begin operational testing in mid-2024 with Initial Operating Capability shortly thereafter. Fielding is scheduled to begin in the latter portion of 2024 and, once installed, Silent Knight Radar will provide AFSOC crews greatly improved mobility in denied, peer/near peer threat environments. SKR is currently fielded on US Army Special Operations Command (USASOC) MH-47 and MH-60 aircraft and is performing very well.

#### A&M: From an ISR perspective, speak to the Adaptive Airborne Enterprise (A2E) concept and how that leverages to existing assets to enhance ISR capability?

**Col. Kuebler:** Adaptive Airborne Enterprise (A2E) is a phasedapproach to develop human-machine teams commanding a family of uncrewed and optionally-crewed Airborne Intelligence, Surveillance, and Reconnaissance (ISR) systems. A2E addresses USSOCOM Key Operational Problems and several Air Force imperatives by operationalizing the Unmanned Aerial Systems (UAS) strategy to provide exquisite, attritable, and expendable UAS for collaborative operations in permissive, contested, and denied environments.

Development and integration of an open systems architecture (OSA) and common payload interfaces are key A2E enablers for both legacy and future airborne ISR systems. OSA supports rapid integration of sensors and payloads by limiting the impact to system operational flight software which results in a dramatic reduction in the scope of testing leading to quicker fielding of new capabilities. OSA is the foundation for the follow-on A2E efforts which will modify our current legacy ISR platforms for effective employment within the collaborative A2E environment.

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#### USSOCOM AT&L OPTIMIZING LETHALITY AND SURVIVABILITY

## POWERING MISSION REACH AND ENHANCING SURVIVABILITY

Appointed to the Senior Executive Service in August 2019, Geoffrey R. Downer currently serves as the Director Special Programs (Aviation), U.S. Army Aviation and Missile Command (AMCOM) and Program Executive Officer for Rotary Wing with duty station at Fort Eustis, Virginia. In this position, Mr. Downer is responsible for the development, acquisition, modernization, fielding and sustainment of the U.S. Army's Special Operations classified and unclassified fleet of uniquely configured aviation vehicles. The objective of these low density, high demand classified and unclassified aviation enablers, is to provide the capability necessary for the U.S. Army Special Operations Forces to execute their mission to find, fix and finish targets of interest anywhere in the world, under hostile conditions, in the most extreme operational environments and conditions for the war on terrorism. Mr. Downer also serves on the Army's Aviation General Officer Steering Committee.

Armor & Mobility spoke with Mr. Geoffrey Downer, Program Executive for Officer Rotary Wing, U.S. Special Operations Command, regarding current and ongoing efforts to support SOF and Conventional vertical lift needs by extending survivability and range in future Multi-Domain operational environments.

## A&M: As global conflict deterrence today relies on robust vertical lift insertion and egress, what are PEO RW's mission focus areas?

**Mr. Downer:** PEO Rotary Wing (RW) provides the Army Special Operations Aviation Command and 160th Special Operations Aviation Regiment (SOAR) (Airborne) with the most advanced RW aircraft, mission equipment, and training systems available. To accomplish this critical mission, PEO-RW focuses on readiness, advanced technologies, and life-cycle logistics to ensure the 160th SOAR maintains a competitive advantage against all potential threats. Along with the Technology Applications Program Office and Product Manager SOF Training Systems, PEO-RW resources strategies that support a three-part acquisition strategy of technology recapitalization, lethality, and survivability upgrades, and planning for the future of SOF vertical lift. These helicopters must also be capable of operating at extended ranges under adverse weather conditions to infiltrate, provide logistics for, reinforce, and extract SOF in contested or anti-access/area denial (A2/AD) environments in support of Multi-Domain Operations.

#### A&M: From MH-60M Block 1 Project Management Office (PMO) and A/ MH-6 Block 3 Mission Enhanced Little Bird PMO perspectives, how are situational awareness and increased payload?



## Geoffrey R. Downer Program Executive Officer Rotary Wing

Director, Special Programs (Aviation) U.S. Army Aviation and Missile Command Mr. Downer: Throughout the years we have added capabilities to our aircraft to include aircraft survivability equipment, sensors, avionics, weapons, and various mission equipment kits. Each of these systems have associated A-Kits and B-Kits which add weight to the aircraft and over time our aircraft have increased in weight which has adversely impacted our payload capabilities. Because of this, we are constantly looking at ways to restore that payload loss through weight reduction to other systems/subsystems on the aircraft, rotor improvements, and incorporating increased horsepower engines on our aircraft.

Additionally, we are pursuing emerging technologies to improve our crew's situational awareness to provide the opportunity to operate in any environment and provide better aircraft/crew safety. To meet this end, we look at technologies that other services are developing to find opportunities to collaborate or enter into efforts that develop SOF unique solutions.

The currently fielded MH-60M Block 1.0 provides increased situational awareness to the crews through technology insertions for critical mission equipment to include the Degraded Visual Environment Pilotage System (DVEPS) that was jointly developed with the Army.

#### USSOCOM AT&L OPTIMIZING LETHALITY AND SURVIVABILITY

The DVEPS system is designed to fuse sensor information and Digital Terrain Elevation Data (DTED) to provide real time information related to landing zone obstacles and reference points to provide a synthetic visual scene in a zero-visibility landing. Additionally, the aircraft is equipped with a Silent Knight Radar (SKR) that provides terrainfollowing/terrain-avoidance information to the crew which is also common with the MH-47G and the CV-22B. SKR allows the crews to fly at low altitudes at flight speeds regardless of the environmental conditions. The MH-60M has increased payload capabilities through main rotor speed improvements that not only provides greater lift but provide greater directional control margin. The next big step in payload restoration is anticipated to come from integration of the Army's Improved Turbine Engine Program (ITEP) engine on the MH-60M during the Block 2.0 program. The ITEP is the Army's next generation engine that will be the engine for its next generation FARA aircraft but will also be installed on the Army's UH-60 and AH-64 aircraft. USSOCOM is currently flying with a SOF unique engine in the MH-60M with the GE YT-706 engine that provides 600 Shaft Horsepower (SHP) over the Army's T-700 engine. The ITEP will provide USSOCOM additional SHP over the YT-706. USSOCOM plans to follow the Army's effort to install the ITEP in the UH-60M induction for the MH-60M Block 2.0 modification which is expected to begin in FY27.

100% of SOF's fleet of AH/MH-6M aircraft is currently in the Block 2.2 configuration. USSOCOM plans to enhance the aircraft's situational awareness of the aircraft through the Block 3.0 program. This effort includes a new digital cockpit, the Avionics Management System (AMS), that provides functionality similar to that of the 160th SOAR MH-60M and MH-47G Common Avionics Architecture System (CAAS) cockpit in smaller form function and lighter weight. The AMS cockpit addresses obsolescence issues by providing higher resolution displays that can display digital information from onboard sensors and by accommodating upgraded communications packages with data transfer capability. Additionally, the Block 3.0 program consists of a new machined aluminum airframe for the aircraft that not only resets the life of the aircraft, but also provides for greater safety margins in the future. The new cockpit design separates primary flight display information from mission system information. This architecture enables the rapid integration of mission systems such as aircraft survivability equipment, communication systems and advanced sensors without an impact to the flight critical portions of the system.

#### A&M: How are Block I MH-47G deliveries coming along and what is the state of Block II heavy assault fleet integration? Are there any improvements planned for either?

**Mr. Downer:** The entire 160th Special Operations Aviation Regiment (SOAR) MH-47G aircraft are currently in the Block I configuration and the fleet continues incremental upgrades to mission equipment systems such as Aircraft Survivability Equipment (ASE), avionics, and tactical mission networking. The current focus on the MH-47G effort is the Block II program where new machined aluminum airframes are being manufactured and the legacy systems and subsystem (engines, drive components, flight controls, etc.) are recapitalized, refurbished, and installed in these new airframes. Improvements made to the MH-47G Block II are a higher degree of commonality with the Army CH-47F Block II with a common operating gross weight, common flight spectrum, and a higher degree of commonality with major airframe subassemblies. As SOF transitioned from the Block



The 160th Special Operations Aviation Regiment (SOAR) continues incremental upgrades to MH-47G mission equipment systems such as Aircraft Survivability Equipment (ASE), avionics, and tactical mission networking. Block II improvements will include new machined aluminum airframes and recapitalization of legacy systems and subsystems such as engines, drive components, and flight controls. (160th SOAR)

I to Block II configuration it was an opportunity to reduce the gross weight of the SOF variant by nearly 1,000 pounds with modifications such as lighter weight wire and connectors, and an integrated ballistic protection system. Additionally, the aircraft was designed with increased structure in the engine bay to accommodate a larger engine in the future if the Army or USSOCOM decides to replace the engine. To date, USSOCOM has received 15 MH-47G Block II aircraft from Boeing's Ridley Park, PA facility.

USSOCOM has several improvements planned for the Block II program. Examples include fielding and operational use of the Engine Barrier Filter, MH-47G Shipboard Landing envelope expansion, Advanced Parallel Actuator System (APAS) that will provide the pilots an opportunity to fly a larger envelope, and the development and inclusion of enhanced maintenance practices into Block II. USSOCOM and the Army are also looking at incorporating an Improved Drive Train and Rotor System which gives the Chinook an extra 4,000 pounds of lift capability and a 10% increase in torque.

#### A&M: In terms of Silent Knight Radar as a basis for sensor data fusion to enhance situational awareness, how is the PEO progressing? Feel free to speak to other goals/challenges.

Mr. Downer: PEO RW is in the beginning stages of the Sensor Data Fusion effort. We are reducing risk by starting the effort by leveraging the Terrain Following and Terrain Avoidance (TF/TA) sensor information in conjunction with Degraded Visual Environment Pilotage System (DVEPS). This enables us to demonstrate the multiplicative data sensor fusion effects provided to our SOF aircrews while also informing our emerging technical strategy on how to best scale sensor data fusion in our aircraft and throughout the mission sets. By fusing disparate systems and federated systems into a 3-Dimensional World Model, we can significantly reduce the cognitive workload of our operators during both the enroute and approach profiles of flight. As we progress in the early development of sensor data fusion, we are excited that the lessons that we are learning will be directly applicable to various other sensors on the aircraft. The goal will be to add new sensors to the aircraft with seamless fusing in order to reduce integration timelines and provide the most advanced situational awareness to the pilot.

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## EXPANDING THE INTEROPERABILITY ENVELOPE IN CYBERSPACE AWARENESS

Colonel Rhea Pritchett is a native of New York. She graduated from Hofstra University, Hempstead, New York in 1999 and received her commission as a Second Lieutenant in the United States Army Signal Corps.

COL Pritchett's previous assignments include numerous assignments at Fort Hood, Texas: Nodal Platoon Leader, A Company, 16th Signal Battalion, Company Executive Officer, C Company, 16th Signal Battalion, Operations officer and Assistant S-3, HHC, 16th Signal Battalion., Detachment Commander and Battalion S-6, 11th Military Police Battalion (CID), Operations Officer, 57th Signal Battalion. Colonel Pritchett completed two combat deployments to Irag in support of OIF and was selected for the Acquisition Workforce in 2006. Her Acquisition assignments include Test Officer for Operational Test Command, Fort Hood, Texas, Assistant Product Manager for PdM WIN-T Inc.1 and Strategic Mission Command at Aberdeen Proving Ground, Maryland and an Assistant TRADOC Capabilities Manager for Network and Services at Fort Gordon, Georgia. In 2016, Colonel Pritchett served as a Training with Industry Fellow at Lockheed Martin Rotary and Mission Systems in Orlando, Florida. Immediately following her TWI assignment in 2017, she became a board selected Product Manager for Live Training Systems within the Program Executive Office for Simulations, Training and Instrumentation in Orlando, Florida. Colonel Pritchett's most recent assignment was as the Military Deputy for the Software Engineering Center at Aberdeen Proving Ground, MD.

Armor & Mobility spoke with COL Rhea Pritchett, Program Executive Officer SOF Digital Applications, U.S. Special Operations Command, regarding current and ongoing mission sets that address the need for SOF to stay on the cutting edge of secure, open architecture driven communications in the virtual combat space.

## A&M: With future global conflict deterrence dependent on robust software deployment, what are PEO SDA's mission focus areas?

**COL Pritchett:** PEO-SDA delivers innovative, relevant, and dependable Special Operations-peculiar software and data capabilities for the SOF warfighter to achieve information dominance and win in a complex environment. PEO-SDA software and data capabilities cover the spectrum of mission planning, public/non-public/commercial data, intelligence, and command and control enabling mission command. Moreover, these software and data capabilities support a myriad of mission sets prioritized by SOF Warfighters. At present,



## COL Rhea M. Pritchett

Program Executive Officer SOF Digital Applications

PEO-SDA is focused on integrating existing and new software and data capabilities on various networks utilizing common core services to enable Integrated Deterrence, competition, crisis, and conflict.

#### Key Mission Areas include:

- OPS/ All Source Intel Data Fusion
- Digital ISR
- AI Enabled Decision Support Systems
- Data Centricity
- Open System Architectures

PM Intel philosophy is that most of the tools exist to be able to perform the analyst's job. Our job is to provide applicable data feeds and interoperability amongst tools and commands. We are focused on an open concept architecture with a host of tools available in the "toolkit". PM Intel is also focused on the fusion of PAI/CAI data with other collected intel data along with a D-DIL capability for a potentially contested comms environment.

SDA is focused on integrating and shortening the decision chain across the enterprise and at every level while reducing the cognitive burden on the individuals on our team.

#### USSOCOM AT&L ACHIEVING INFORMATION DOMINANCE

#### A&M: From a data fusion perspective, what is the state of the Distributed Common Ground/Surface System SOF and Fusion Analysis **Development Effort (FADE)?**

COL Pritchett: FADE/MIST is one of the available tools in the "toolkit" for all source analysts' workflows. It is government-owned so it is not going anywhere. It is still a resource available with regular improvements provided by the hosting agency. However, as we have discovered, one tool does not do all things for the multi-intelligence environment our analysts work in so we have invested in or discovered other tools to fill gaps for our users.

#### A&M: In terms of SOF Geospatial Intelligence Processing (SGIP), how is 3-D modeling aiding in video processing, exploitation, and dissemination for operational fluidity?

COL Pritchett: 3D modelling is one of the tools available to analysts which can be used for mensuration of objects such as walls, or it can be used to help build additional situational awareness of an area. There are multiple commercially available and open-source 3D modeling solutions available for use.

#### A&M: What is the state of Mission Command System/Common Operating Picture (MCS/COP) integration and sustainment?

**COL Pritchett:** MCS/COP utilizes a modular open systems approach leveraging best in breed capabilities to create an ecosystem of interoperable and collaborative tools and services to enable command and control for mission command. As an ecosystem, MCS capabilities are currently deployed in the cloud as well as on-premises, in integrated and stand-alone configurations, and support strategic, operational, and tactical missions. Moving forward, the program is focused on integrating existing stand-alone capabilities as microservices in the MCS ecosystem and transitioning the ecosystem to a modern Kubernetes based environment that utilizes commodity hardware and cloud resources including tactical mission networks managed by individual SOF commands. The program continues to work towards creating a singular integrated capability for SOF by FY25.

#### A&M: How is the Tactical Assault Kit (TAK) improving mission execution?

COL Pritchett: The Tactical Assault Kit suit of tools provides an underlying common communication and situational awareness platform that enables SOF operators and commanders to shorten the kill chain. By providing a lightweight, portable tool that works across platforms using simple cursor on target protocols, we are able to build our SOF-peculiar tool sets in a way that lets commanders, analysts, unmanned systems and sensors, and operators in the air, ground, and sea have integrated, real time situational awareness, even at the edge and in communications denied environments.

#### A&M: Feel free to speak to goals/challenges moving forward.

COL Pritchett: MCS is working with the Command Digital and Artificial Intelligence Office, the J6, and PEO-C4 to pilot an open-source data architecture including a data lake house, data fabric, and shared graph store to make SOF data accessible and usable on each network classification. Moreover, this data layer will enable SOF interoperability

with Joint, Interagency, Intergovernmental, and Mission Partners and provide SOF options to operate in Joint All Domain Command and Control (JADC2) environments.

#### PM Special Operations Mission Planning & Execution/Tactical Assault Kit Objectives:

**GOALS:** All domain capability convergence (i.e. air and TAK); DDIL enhancement; Integrated multi-code route planning; Development and deployment automation

CHALLENGES: Lessening the cognitive burden on operators



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## POSITIONING MOUNTED SOF FOR FUTURE THREAT DEFEAT

Lt. Col. Romero currently serves as the Program Manager for Family of Special Operations Vehicles, U.S. Special Operations Command. In this role, he is responsible for the planning, development, acquisition, testing and product improvement for SOF-unique ground mobility. Lt. Col. Romero was commissioned in 2002 and in 2004 he reported to 3rd Material Readiness Battalion in Okinawa, Japan as the Reparable Issue Point Officer-in-Charge. From 2005-2008, Lt. Col. Romero served as both the Supply Officer and Headquarters Company Commander for 3rd Battalion, 5th Marines and deployed in support of Operation Iraqi Freedom 05-07.1 and Operation Iragi m 06-08.2 in Al Fallujah, Irag. In 2008, Lt. Col. Romero attended the Naval Post Graduate School with a follow-on assignment to Headquarters Marine Corps, Programs & Resources, Program, Assessment and Evaluation. While there, he served as the sustainment Program Evaluation Board analyst, conventional ground ammunition analyst, and Assistant Commandant of the Marine Corps directed reset and reconstitution analyst. In 2013, Lt. Col. Romero reported to 2d Supply Battalion as the Supply Company Commander and in 2014, was assigned at the Combat Logistics Battalion-26 Operations Officer. Lt. Col. Romero deployed with the 26 Marine Expeditionary Unit in support of the 6th Fleet and 5th Fleet area of responsibility to include the establishment of Fire Base Bell in Erbil, Iraq for Operation Inherent Resolve. In 2016, Lt. Col. Romero attended Air Command and Staff College. From 2017-2020, Lt. Col. Romero served as both the Operations Officer and XO for Marine Corps Logistics Base Barstow. In 2020, Lt. Col. Romero received the Ground Acquisition Military Occupational Specialty designation.

Armor & Mobility spoke recently with Lt. Col. Alfredo Romero, Program Manager, Family of Special Operations Vehicles (PM FOSOV), U.S. Special Operations Command, regarding current and ongoing program efforts designed to keep SOF and Joint Partners ready for the future ground fight.

## A&M: With global conflict deterrence today dependent on reliable SOF ground presence, what PM FOSOV's primary mission focus?

Lt. Col. Romero: PM FOSOV's primary mission focus is to support USSOCOM Commander priorities and to ensure the PM FOSOV fleet is postured to meet the current and future operating environment. Increased survivability, mobility, lethality, transportability, signature management, and mission payload are themes we strive to focus on within PM FOSOV. At the end of the day, our goal is enabling the warfighter to complete their mission. We receive a lot of feedback from the USSOCOM user community, which generates Engineering Change Proposals (ECPs) to modify certain characteristics of the PM FOSOV fleet.



## Lt. Col. Alfredo Romero

Program Manager Family of Special Operations Vehicles U.S. Special Operations Command

A&M: From a Light Tactical-All Terrain Vehicle (LTATV) perspective, what is the state of Increment II 2 and 4 seat variants?

Lt. Col. Romero: PM FOSOV is in full production of the four-seat variant. The Light Tactical All-Terrain Vehicle (LTATV) Program recently completed performance testing of the Increment II Accessory kits (Top Mounted Weapon Package, Occupant Compartment Enclosure Kit (OCEK) and Artic Mobility Tracks kit). PM FOSOV will investigate light weight lethality packages for the LTATV.

## A&M: Also state of Joint Light Tactical Vehicle (JLTV) heavy gun acquisition?

Lt. Col. Romero: USSOCOM is not procuring JLTV Heavy Gun Carriers, this is considered "Big Service" provided equipment. USSOCOM is only providing bolt on expansion Special Operations Peculiar (SO-p) Vehicle Interface Kits along with other safety and lethality related kits.

A&M: How is V-22 Internal Transportable Vehicle (ITV) integration and sustainment going? Any lessons learned for likely improvements?

#### USSOCOM AT&L TRANSPORTING CRITICAL MISSION PAYLOAD

Lt. Col. Romero: The ITV is not currently a part of the PM FOSOV fleet.

#### A&M: With evolution of Ground Mobility Vehicle (GMV) 1.0 to 1.1, are there any improvements currently planned and what is the state of H-47 internally transportable variant integration?

Lt. Col. Romero: Currently, the GMV 1.1 is in the Sustainment Phase after production ended in June 2021. Prior to that, the GMV 1.1 designed/developed several major engineering change proposals (ECPs) onto the platform that provided increased capability from the legacy GMV 1.0 such as increased payload (11,200 lbs. to 13,000 lbs. Gross Vehicle Weight), horsepower, upgraded suspension system and improved Reliability/Durability over the vehicles harsh Mission Terrain/Profile. Currently, the GMV 1.1 is C/MH-47 Internally Transportable and in a ready to fight configuration, which the GMV 1.0 is not.

# A&M: From a Heavy Tactical Vehicles (HTV) perspective, what is the state of RG-33 sustainment and how far along is progress toward a full fleet of SOF-specific M-ATVs?

Lt. Col. Romero: RG-33s are currently being sustained with residual parts on-hand. The USSOCOM enterprise and Special Operations Command Central Command (SOCCENT) are evaluating armored casualty evacuation and MRAP level survivability requirements. This could trigger an enduring RG-33 requirement and formal



U.S. Army Special Operations Soldiers with 3rd Special Forces Group (Airborne) conduct a security halt with a ground mobility vehicle 1.1 at Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, CA. The Green Berets used the MCAGCC training areas to refine detachment tactics and prepare for combat operations. (U.S. Marine Corps photo by Cpl. William Chockey)

sustainment of this Army divested platform or give birth to a different capability altogether. The U.S. Marine Corps recently divested of its service common M-ATV M1240 Variant. United States Army Special Operations Command (USASOC) has established enduring requirements for both U.S. Army Service Common M-ATVS and the SO-p M-ATV. This is not expected to change due to a limited number of available SO-p M-ATVs.

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# PRECISION FIRES EVOLUTION EXTENDING TARGET COMMAND AND CONTROL AUGMENTING LETHAL REACH DOWN RANGE

U.S. Army Futures Command Long Range Precision Fires Cross Functional Team is testing Extended Range Cannon Artillery, or ERCA, to accommodate more modularity in firepower. By Mark Schauer, Yuma Proving Ground



U.S. Army Yuma Proving Ground has conducted extensive developmental testing of prototypes of the XM 1299 self-propelled howitzer, and recently hosted the third Soldier Touchpoint of the system held at the proving ground. This event marked the first time that Soldiers have been able to drive the vehicle in realistic conditions in the natural environment. (Photo by Mark Schauer)

U.S. Army Yuma Proving Ground (YPG) is at the forefront of Army modernization efforts. Perhaps the highest profile test projects at YPG in recent years support the Army's top modernization priority: long range precision fires.

The Army aspires to dramatically increase the range of smart munitions over the 30 kilometers a currently fielded 155mm howitzer shell is capable of when fired at top zone with rocket assistance. YPG testing has already achieved significantly increased distances in test fires conducted at both the proving ground and the nearby Barry M. Goldwater Range.

#### ENHANCING ORDNANCE AND WEAPONRY

Called Extended Range Cannon Artillery (ERCA), YPG is currently conducting developmental testing of multiple facets of it, from the artillery shells to the longer cannon tube and larger firing chamber the improved howitzer will need to accommodate them. YPG's ammunition plant has been instrumental in building multiple experimental formulations, shapes, and configurations for new propelling charges to accommodate the improved projectiles.

"It's not a baby step, it is a big leap," said Steve Flores, Long Range Precision Fires Cross Functional Team Integrator. "It's a soup-to-nuts redesign of the artillery system: a new cannon, a new platform, and new ammunition."

YPG has also conducted extensive developmental testing of prototypes of the XM 1299 self-propelled howitzer, and recently hosted the third Soldier Touchpoint of the system held at the proving ground. This event marked the first time that Soldiers have been able to drive the vehicle in realistic conditions in the natural environment.

"It's meant to get equipment into the hands of Soldiers earlier," said Flores. "It gets user feedback for the development of the weapon system and the munition."

## PRECISION FIRES EVOLUTION EXTENDING TARGET COMMAND AND CONTROL



Yuma Proving Ground conducts developmental testing of multiple facets of the Extended Range Cannon Artillery (ERCA), from the artillery shells to the longer cannon tube and larger firing chamber the improved howitzer will need to accommodate them. (Photo by Mark Schauer)

"They validate the Soldiers' crew drills, get them used to it, and see what they think," explained Hector Magana, test officer. "They ask if it is going to help them or not, what about the new system that they like and don't like. Based on that, they make changes to the vehicle before it gets fielded."

#### EMPLOYING USER FEEDBACK TO MAXIMIZE IMPROVEMENT

The Soldiers who participated in the week-long event hailed from the unit that will do operational assessments of the platform in fiscal year 2024.

"Each one of them was handpicked specifically for the skills that they have shown in the line of duty," said Giancarlo Torres, test officer. "Any recommendations they may have will be taken with high value."

YPG support included personnel to drive and operate the weapon, data collectors, test officers, and instrumentation personnel. Though Soldiers will ultimately fire the weapon, this touchpoint focused on other aspects of operation, such as breech and tube maintenance, and YPG gun crews performed all firing.

"We make sure the vehicles are ready, that they have all of the ammunition and propellant they need to do live fires and make sure they have support from drivers and test officers to ensure everything is done safely," said Magana.

"Our personnel are the ones trained on how to operate the prototypes," added Flores. "It makes sense to bring the Soldiers here to be trained by our trained personnel as well as the developers."





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# MATERIAL SUPPLY CHAIN CREATING COMMON OPERATIONAL ADVANTAGE PROMOTING COMMON ACCESS TO MISSION-CRITICAL KNOWLEDGE

The Defense Logistics Agency (DLA) is working to develop common technology, standards and processes for additive manufacturing (AM) that will enable the military services to share data and increase readiness while saving money.

By Beth Reece, Defense Logistics Agency



Cody Hagood, right, from the U.S. Army Redstone Test Center, demonstrates to Anthony Delgado, left, additive manufacturing program manager for the Defense Logistics Agency, and others how an additively manufactured fuel elbow for the UH-60 Black Hawk looks through a computer aided design at Redstone Arsenal, Alabama. (DoD image)

"Our research and development efforts are enabling digital transformation across the Defense Department, facilitating critical collaboration with our partners, and will ensure DLA is poised to be a force enabler for AM across DOD," said Patrick Kelleher, executive director of operations and sustainment for DLA Logistics Operations.

DLA's four-pronged role in additive manufacturing, or AM, was formally defined in June 2021 through DOD Instruction 5000.93. It includes defining processes to integrate AM into the supply chain and setting standards for safely handling and distributing raw materials. The agency's second focus area is developing processes for sharing supplier-generated technical data across the department and documenting and maintaining a list of sources that have successfully delivered AM parts and raw materials.

Developing a DOD framework for sharing common technical data requirements and acceptance criteria is the third part of DLA's AM efforts, followed by the responsibility to integrate AM into the department's IT architecture.

"DLA's role is more clearly defined than ever, and that's to be a

facilitator and enabler of service-driven AM capabilities," Kelleher said. "We're focused on eventually procuring AM items designated for DLA supply support. This is only going to be possible with strong collaboration and strategic partnerships with the military services."

#### **EMPLOYING THREE DIMENSIONAL MODELING**

The Joint Additive Manufacturing Model Exchange (JAMMEX) is a key part of DLA's contribution and lets users download and print 3D models from multiple sources through a single system. It launched in January 2020 and the Army is the first service to use it. Kelleher said the best use for JAMMEX so far is for interim parts for battledamaged equipment while users wait for the actual part to be delivered.

"DLA is excited for JAMMEX to continue to provide a full spectrum of support to the warfighter by reducing readiness risks, decreasing costs by providing a catalog of alternate sources for hard-to-procure and obsolete parts, and improving responsiveness," he added.

#### MATERIAL SUPPLY CHAIN CREATING COMMON OPERATIONAL ADVANTAGE

Navy LCDR Jake Lunday, an engineering duty officer and additive manufacturing analyst, organizes 3D printed parts aboard the USS Indianapolis. The Defense Logistics Agency is working with the military services and industry to develop common technology, standards and processes for additive manufacturing. (Photo by Navy Petty Officer 3rd Class Austin Collins)



DLA is also working toward remote inspection for additively manufactured parts. Conventional inspections can take over 100 steps, but remote inspections typically take about 10, Kelleher said, adding that the benefits of remote inspection are significant.

"It allows for real-time feedback from various experts, which improves inspection quality and speed. It reduces contract lead time and travel costs, and increases material availability," he continued.

#### **REDUCING COST WITHOUT SACRIFICING QUALITY**

The DOD Manufacturing Technology Program gives DLA yet another way to develop and support advanced manufacturing technologies to lower costs for production as well as repair and maintenance. The agency's R&D team recently partnered with the Army, academia and industry through ManTech to use AM to address supply shortages due to an issue in manufacturing quality of a fuel elbow for the UH-60 Black Hawk helicopter.

"This initiative showcases DLA's ability to partner with the military services to design, build and test additive manufacturing parts to strengthen the defense supply chain," Kelleher said.

DLA Aviation Commander Air Force Brig. Gen. Sean Tyler said that the ability to download validated 3D designs and print parts anywhere in the world is a game changer for military logistics because it can make legacy weapons systems easier to maintain. "Rather than having to continue to produce and store parts for potential obsolescence, we can store digital plans and manufacture true just-in-time, on-the-spot parts and equipment," he said.

Tyler also stressed that expanding AM throughout DOD requires alignment and commitment from stakeholders ranging from program offices and academia to engineers.



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June 26 - 27 AUSA Warfighter Summit & Expo

Fayetteville, NC Meetings.ausa.org/warfighter23

June 26 - 29 NSMMS & CRASTE Tucson, AZ Usasymposium.com

June 27 – 29 Modern Day Marine Washington, DC Moderndaymarine.com

June 28 - 29 Automated ISR & Battle Management Symposium National Harbor, MD Autoisr.dsigroup.org

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August 15 - 17

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