

SPECTRUM

L3Harris Communication Systems Publication | AUSA 2020 Edition

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The appearance of U.S. Department of Defense (DoD) visual
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Spectrum is a L3Harris Communication Systems publication. The magazine provides the most-up-to-date information about innovative technologies, products and customer solutions through interactive features and in-depth story telling.



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L3Harris Communication Systems Publication | AUSA 2020 Edition



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OSCAR MIC CHECK

**SOF require flexible,
resilient and secure
communications on land,
in the air and at sea.**

Inside Cover photo:

The L3Harris Manned-Unmanned Teaming (MUMT) airborne data link system delivers secure communications between manned and unmanned aircraft, including the AH-64 Apache and MQ-1 Predator, and troops on the ground.

The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.

Non-Export Controlled Information

L3Harris Technologies is an agile global aerospace and defense technology innovator, delivering end-to-end solutions that meet customers' mission-critical needs. The company provides advanced defense and commercial technologies across air, land, sea, space and cyber domains.

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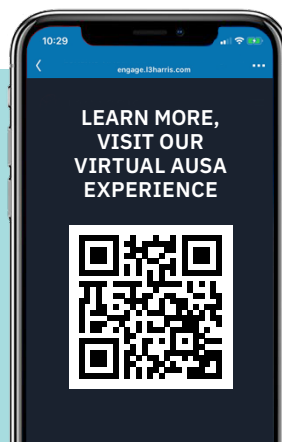
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One year after the merger of L3 Technologies and Harris Corporation, L3Harris Technologies is an agile global aerospace and defense technology company uniquely positioned to deliver innovative, end-to-end solutions, leveraging the industry-leading expertise of both legacy companies.

NEWS BRIEFS



First U.S. Army Unit Receives Enhanced Night Vision Goggle – Binocular

L3Harris has completed delivery of 656 combat-ready Enhanced Night Vision Goggle – Binocular systems to the U.S. Army. This next-generation night vision technology enhances the soldier's ability to locate and engage threats and access common operating environment imagery, improving Situational Awareness, mobility and protection.



U.S. Army Awards L3Harris with Third LRIP HMS Manpack Order

L3Harris Technologies received a third Low-Rate Initial Production (LRIP) order valued at \$95 million from the U.S. Army under the Handheld, Manpack & Small (HMS) Form-Fit Indefinite Delivery, Indefinite Quantity (IDIQ) contract to bring AN/PRC-158 multi-channel radios to the battlefield.

This LRIP will be followed by an Operational Test that will inform a Full-Rate Production decision for the AN/PRC-158 and other HMS products. The IDIQ contract includes a five-year base and an additional five-year option with a ceiling of \$12.7 billion. The Army expects to purchase approximately 65,000 HMS Manpack radios under the IDIQ.



STORM-SLX Hits Delivery Milestone for U.S. Army

L3Harris Technologies delivered the 3,000th STORM-SLX precision rangefinder to the U.S. Army earlier this year. The Small Tactical Optical Rifle-Mounted laser rangefinder system is the smallest U.S. Army-qualified weapon-mounted laser rangefinder available to the dismounted soldier. Part of the L3Harris STORM family of precision targeting systems, the STORM-SLX has extended performance over its predecessor. The STORM family continues to be the only U.S. Army-qualified laser rangefinders available for the dismounted soldier.



U.S. Marine Corps Awards L3Harris \$383 Million Contract with Initial Delivery Order for HF Radios

The U.S. Marine Corps awarded L3Harris Technologies a five-year, \$383 million ceiling, single-award Indefinite Delivery, Indefinite Quantity contract — with an initial delivery order of \$89 million — for AN/PRC-160 HF radios as part of the High Frequency Radio II program.

The contract enables the Marine Corps and other Department of Defense services to procure L3Harris AN/PRC-160 HF radios and related equipment. U.S. branches of the Marine Corps, Army, Navy, Air Force and Special Operations Command (USSOCOM) are all engaging in modernization efforts to meet evolving mission needs.



TO READ MORE ABOUT L3HARRIS' SUPPORT OF THE ARMY'S NETWORK MODERNIZATION EFFORTS, GO TO PAGE 8.

The U.S. Army is eyeing the AH-64 Apache, the E-variant of which is seen here equipped with the L3Harris Manned/Unmanned Teaming-eXpanded antenna, as one of the rotary-wing platforms to benefit from Air-Launched Effect capabilities.

Strengthening Army Aircraft Survivability

An important element of the U.S. Army's modernization priorities is the ability for rotary-wing attack aircraft to engage adversaries outside their targets' weapon system effective range.

L3Harris is supporting several efforts toward this goal, including developing components for the service's Air Launched Effects (ALE) program. The small unmanned aircraft, launched from Army aircraft, will be capable of conducting numerous missions, but the Army has prioritized the Detect, Identify, Locate and Report (DILR) mission.

ALE is part of a two-pronged concept supporting Army helicopters, including the currently fielded AH-64 Apache and the next-generation Future Attack/Reconnaissance Aircraft (FARA), to identify and engage targets beyond the line of sight leveraging ALE and long-range precision munitions.

In the first phase of several in the Army's "crawl-walk-run" approach to this new technology, L3Harris will conceive how ALE will achieve its DILR mission, according to Grant Webb, Army Business Development lead for L3Harris' Broadband Communications sector. This phase's five-month period of performance began in September 2020.

"When ALE finds a target, it can send the information to the launch platform,

and then the launch platform can fire a long-range precision munition – at a significantly greater range than the Hellfire missiles currently on Apache," Webb said. "The net effect gives the launching platform significantly more standoff [range], which provides more survivability for the aircraft and its crew members."

L3Harris is proposing a resilient datalink for ALE with a cutting-edge low-probability-of-detection, anti-jam waveform, Webb said. The solution "meshes" the radio network so the individual radios on ALE can coordinate amongst each other through a cognitive brain. This cognitive brain can support collaborative behaviors and lend itself to "swarming" configurations using multiple aircraft to more expeditiously conduct its missions.

The Army plans to conduct a series of down-select decisions throughout the course of the program until it has prime contractors for the mission system, payload and air vehicle that will comprise ALE.

While the final concept of operations will depend on the success of numerous tests and experiments over the next few years, the Army is also experimenting with launching ALE from the MQ-1C Grey Eagle unmanned aircraft and is investigating the feasibility to leverage satellite communications for the program, according to Webb.



U.S. Special Operations Command Awards L3Harris Upgrade Contract

The U.S. Special Operations Command awarded L3Harris Technologies a five-year, \$100 million contract to upgrade and extend the service life of its existing fleet of approximately 550 L3Harris Very Small Aperture Terminals.



L3Harris Begins Work on JP2008 Ph 3H Sustainment Contract

The Commonwealth of Australia selected L3Harris Technologies to deliver sustainment support solutions for MTST satellite terminals, satellite phones, BGAN terminals and other communication equipment for the nation under a performance-based contract. The contract will run for at least 14 months, from July 2020 to mid-2021.

A NEW GENERATION OF NIGHT VISION TECHNOLOGY

The Hyper Enabled Warfighter, L3Harris' latest force-multiplier supporting the U.S. military, fuses capabilities needed to successfully carry out a ground mission into one integrated system, providing next-generation Situational Awareness, lethality and connectivity for end users.

It's dusk somewhere in eastern Europe, and a U.S. Army sniper team provides overwatch to an assault force tasked with recapturing critical national infrastructure from a highly capable enemy force.

Operating in an extremely contested environment, the sniper team is kitted with interconnected next-generation technologies, providing them the critical tactical advantage over the well-trained and well-equipped opposing force.

As the assault force begins its final approach toward the enemy position, the sniper team employs the equipment to detect, recognize and observe enemy combatants in low- and zero-light conditions. All the while, they share surveillance feeds, targeting data and other points of interest in near-real-time with assault teams on the ground as well as a tactical operations center located Beyond-Line-Of-Sight.

The technology also allows the sniper team to accurately guide assault teams to the target, helping them avoid vulnerable areas and choke points.

Once the compound is cleared and secured by coalition forces, the ensemble enables the sniper team to regroup with the assault force in

a GPS-denied environment using Augmented Reality (AR) digital compasses integrated into a heads-up display.

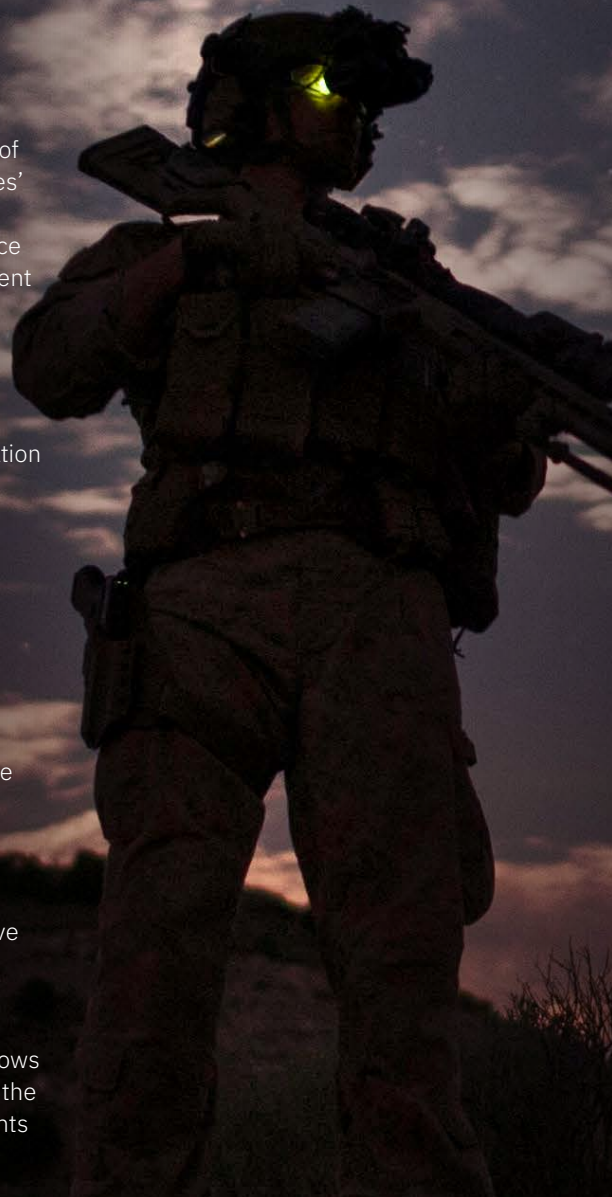
This operational vignette may be fictional, but it demonstrates the "art of the possible" for L3Harris Technologies' new Hyper Enabled Warfighter (HEW) concept, which is now available to force components across the U.S. Department of Defense (DOD).

Comprising a collection of proprietary solutions designed, developed and integrated together by the company, HEW is designed to enhance the Situation Awareness, survivability, lethality and connectivity of Army, Navy and Air Force warfighters operating at the "tactical edge" against peer and near-peer adversaries.

ANSWERING THE DOD'S CALL

The HEW concept has been made possible through L3 Technologies' merger with Harris Corporation in June 2019, according to Lynn Bollengier, president of L3Harris Technologies Communication Systems' Integrated Vision Solutions. This allowed the company to bring together an extensive range of specialist solutions already suited to supporting the warfighter against near-peer and high-capability threats. The development of HEW follows a call-to-action from the DOD to pivot the U.S. Armed Forces toward engagements associated with the "Great Power Competition" in addition to ongoing counter-violent extremist organization operations around the world.

"The HEW will have actionable information at their fingertips, supported through a cycle of interpretation, machine learning, Augmented Reality and Artificial Intelligence, all of which come together to provide actual information to the warfighter in a seamless way," she said, noting the modular concept



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ENVG-B SOLUTION**

can be scaled to support a variety of end-user applications. “Coupled with great hardware, the HEW benefits from increased field of view and surveillance, better image intensification and thermal imagery at night, and laser performance to allow them to complete their job and return home safely.”

CONNECTING THE DOTS

The modern warfighter has never been so well-equipped, although many sub-systems remain unable to communicate and cooperate with one another, according to Leith Ames, L3Harris’ Business Development director for Army programs.

“Warfighters use a laser rangefinder to confirm range and a weapon to observe and engage,” he said. “They use night vision devices to see at night. Most of the time, these pieces will work together, but they will not ‘talk’ to each other or utilize data from each other, which can be fed into a central system to allow the warfighter to become more effective. That’s the gap out there: how do we tie all of these systems together reliably in a way that the warfighter can trust the information coming to them?”

Essentially, HEW has been designed to “empower and unburden” users during engagements where they must remain focused on the objective in front of them instead of being distracted by heads-down displays.

HEW ties together head-, weapon- and body-mounted sensors into a single, secure and wireless network, allowing operators to aggregate, exploit and share data with other end users across the larger battlespace.

“The HEW takes all available data and provides actionable information at the right time to enable the warfighter to shoot, move and communicate more effectively,” Ames said.

HEW is enabled by either L3Harris’ ground-breaking Enhanced Night Vision Goggles-Binocular (ENVG-B) or Fused Ground Panoramic Night Vision Goggle (F-Pano) helmet-mounted systems, and the AN/PRC-163 Software Defined Radio (SDR) – all of which are in the process of

being fielded by elements within the U.S. Army and Special Operations Command.

“The ENVG-B will truly be the greatest goggle that we’ve ever fielded,” Brig. Gen Anthony W. Potts, PEO Soldier, said in an Army statement last year. “The thermal channel has a day-night capability and we’ve added in things like Augmented Reality.”

Beyond this core capability of a head-mounted display and SDR, a series of additional sub-systems can also be integrated into HEW to extend capability further. Options include L3Harris Technologies’ STORM 2 laser rangefinder, ROVER 6 transceiver and the upcoming Next Generation Squad Weapon Fire Control System.

Further, HEW has been designed as a plug-and-play solution capable of accommodating non-proprietary sub-systems including the U.S. Army’s Family of Weapon Sights-Individual.

Networked through the U.S. Army’s Adaptive Squad Architecture, all relevant battlefield information is projected into the heads-up display of the ENVG-B/F-PANO, which immediately negates any requirement for the warfighter to be distracted by a chest-mounted tablet or smartphone. This allows the warfighter to observe an objective over or around cover without presenting themselves as targets to the enemy.

THE ‘SKY IS THE LIMIT’

As Ames suggests, the “sky is the limit” in terms of future capabilities of the HEW.

“Once we get it out there, warfighters will see its benefits and will build upon it with things we didn’t even consider before,” Ames said.

HEW is already positioned to benefit from a string of near-term upgrades, including the integration of edge computing, on-body processing and tactical Cloud support, as well as artificial intelligence and machine learning algorithms.

Additional upgrades on L3Harris’ HEW roadmap include cooperation with autonomous platforms, including unmanned aerial vehicles and autonomous underwater vehicles in particular.

“We are interested in anything that allows the warfighter to receive the right information very quickly and are working with other elements within the company to enable this moving forward,” Ames said, noting L3Harris intends to continue its internal research and development into HEW as the company strives to provide best-in-class capabilities for warfighters today and in the future. “We continue to receive tremendous support from corporate leadership, which illustrates our commitment to get behind synergistic concepts like HEW. It is exciting to see this happen and see the HEW come to life.” |



FOR THE INTEGRATED TACTICAL NETWORK, THE FUTURE IS NOW



L3Harris is demonstrating leading-edge technologies for the Army's future Integrated Tactical Network – today

The U.S. Army is hard at work on a network modernization strategy, which the service says will lead to a force that is “ready to deploy, fight and win decisively against any adversary, anytime, anywhere, in a joint, multi-domain, high intensity conflict, while simultaneously deterring others and maintaining our ability to conduct irregular warfare.”

In order to achieve this strategic imperative, Army Futures Command officials say it is critically important for the service to implement an Integrated Tactical Network, or ITN, described as the “backbone of the Army’s main operations.”

The ITN concept leverages both Programs of Record and Commercial-Off-The-Shelf components and transport capabilities.

THE CORE OF THE NETWORK

An operational test scheduled for January 2021 is the next major milestone toward ITN’s implementation. The test will evaluate the core of the concept – Handheld, Manpack and Small Form-Fit (HMS) radios.

Several L3Harris solutions, including the Falcon®IV AN/PRC-158 multi-channel manpack and the AN/PRC-163 multi-channel handheld radio, are already Programs of Record that enhance the land service’s ability to reach its goal.

In recent and upcoming tests, L3Harris Technologies is demonstrating how some of these core capabilities can enable a communications network that bridges the divide between multidomain voice and data.

L3Harris radio networks leverage wideband capabilities to connect tactical asset voice, data and video together, and high-frequency and Satellite Communications to connect information for expedited decision-making and

interoperability. Whether information is shared from manned or unmanned aerial assets, from soldiers on the ground or on the move, or from forward operating bases and central command locations, L3Harris is demonstrating how robust and resilient communications can be assured, jam-resistant and uninterrupted.

The name of the game is to enable “simplicity, resiliency and mobility,” L3Harris officials say.

Ken Harrison and Bill Seiss have had a front-row seat to the service’s modernization efforts and the exciting developments underway with the new U.S. Army Futures Command. As the local L3Harris Communication Systems representatives in Austin, Texas, they have been listening carefully to understand the warfighter’s needs and to ensure the command has a strong

partner in L3Harris – one that can help bridge the capabilities gap between the current and future Army network.

“Our resilient waveforms will allow operators to communicate without interruption, denial or interception from a threat,” Harrison said. “Our radio products host those waveforms to allow soldiers to communicate on the battlefield and allow platforms to communicate ground-to-ground or air-to-ground.”

L3Harris solutions’ open-architecture design allows for streamlined integration of new waveforms that will provide incremental improvements to meet the Army’s end-state of a “more-resilient, robust, protected tactical communications network,” he added.

The company is investing in products to address the Army’s goal to fight anytime, anywhere, according to Seiss.



The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.

“We’re looking at where the Army’s going and what their goals are for the network, and we’re incorporating those capabilities into our products,” he said.

L3Harris is including automation and machine learning into its networks and waveforms to make “smarter” radios that can automatically choose the best frequency in which to send information, according to Seiss.

The key benefit of the company’s offering is its use of multiple waveforms and channels in its radios, he said.

“One of the Army’s goals is to have multiple means to communicate in case one link goes down,” Seiss said. “These multi-channel radios provide SATCOM – including the new Mobile User Objective System – MANET networks and resilient waveforms all on one radio, providing the warfighter with multiple options.”

While L3Harris radios transport data, voice and video across the battlefield, the company’s Satellite Communications solutions send information beyond the line of sight; night vision technology also offers soldiers the advantage in low-light operations, Harrison added.

“The Army validates their requirements through experimentations and receives immediate feedback from industry to try to reduce the time from development to fielding, which was taking too long in the past,” Harrison said. “The Army is trying to build upon Programs of Record to go to the next level of development to provide greater capability for the network.”

RECENT EVENTS

In parallel to preparations for the test in January, L3Harris is participating in several Army initiatives to test the current state of related technologies to further enhance the ITN, including two Army demonstrations that concluded in the past month.

These combined efforts are “really about being able to penetrate and breach enemy defense systems so that we can have access into theater,” Jeff Smith, vice president of L3Harris Communication Systems Business Development, said. “Bringing in long-range fire, ground targets, air – fixed- and rotary-wing – at one time in the battlespace to give us the

ability to breach enemy systems and get into the operating environment is part of the construct.”

The annual Network Modernization Experiment, or NETMODx, seeks improvements in antijam capabilities in new radios crucial to securing C4I links as well as Manned Unmanned Teaming (MUM-T) communications. L3Harris already pioneered the high-speed transmit-and-receive capability of wideband video and data between U.S. Army AH-64 Apache helicopters and unmanned aircraft, including the MQ-1C Grey Eagle; the recent experiment allowed L3Harris to test new waveforms and begin coordinating next steps with the Army.

Project Convergence is an annual “campaign of learning” to bring together the weapons and capabilities it envisions using in the 2030s and beyond in a seamlessly networked environment.

“To make [Artificial Intelligence, autonomous and robotic capabilities in the air and on ground] work in a digital environment, you have to have an underlying robust and resilient network, and you have to have a data architecture and the data and the talent to put all that together,” Army Futures Command Commander Gen. Mike Murray told *Defense News* in September 2020.

While this year’s experiment mainly focused on weapon systems, L3Harris

brought network modernization solutions to the table, which company officials believe could serve as the backbone of the future system linking all the soldiers’ tools together.

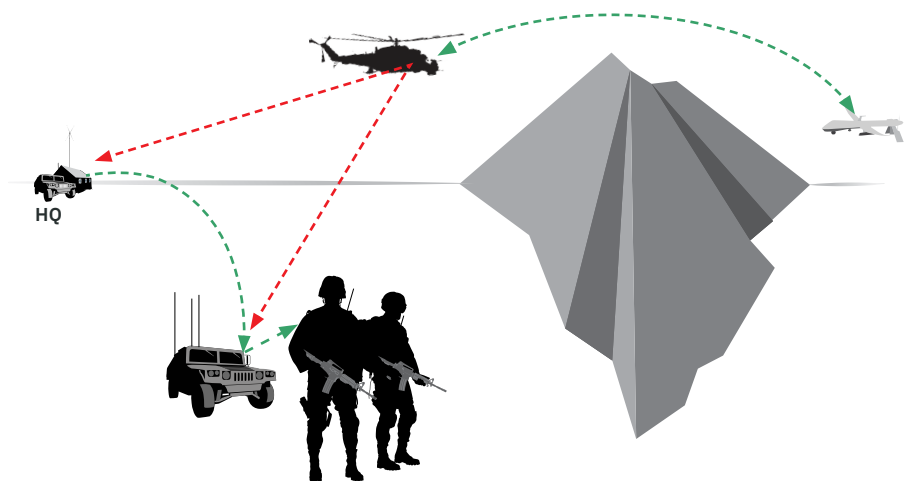
LOOKING FORWARD

As L3Harris prepares for a successful HMS demonstration in January, it continues to evolve its portfolio’s capabilities set to meet future demands.

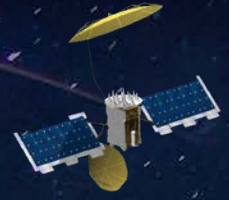
The company is launching a new Small Form Factor single-change radio solution for the Army this year and continues to deliver Enhanced Night Vision Goggles-Binocular and Satellite Communications capabilities to the service. Combined, SFF and ENVG-B work harmoniously to create a complete situational awareness system for ground troops, according to company officials.

Additionally, there are a several demonstrations in the next few months using L3Harris meshed SATCOM services that the Army is looking to integrate into the ITN as the land service continues to evaluate the system’s requirements.

The L3Harris team is listening closely to its Army customers to understand their mission needs as they operate across all warfighting domains, and to provide affordable solutions that will be required of the near-term and future integrated network.



L3Harris officials envision the company’s network modernization solutions as the backbone of a future system linking all the soldier’s tools together. Soldiers in the field can receive information from downrange aerial ISR via a link through manned aircraft. Tactical assets can also report back to Forward Operating Bases all in one integrated network.



GAME-CHANGING TECHNOLOGY FOR U.S. MARINES

L3Harris' leading-edge mission solutions were on full display at Exercise Steel Knight 20.

MEET MUOS

The Mobile User Objective System, MUOS, is the U.S. Defense Department's next-generation Ultra HF tactical satellite communications network. MUOS provides worldwide, BLOS voice and IP connectivity to the DOD Information Network (DODIN) via SIPR/NIPRnet. The MUOS network provides warfighters with unprecedented access to MILSATCOM channels with robust connectivity, increased mobility and enhanced security. Overall, these capabilities provide the ability for MUOS-capable terminals to communicate in underserved and disadvantaged environments connecting to the DODIN anywhere in the world.

Recent field demonstrations provided the U.S. Marine Corps with an up-close perspective on the robust capabilities of the AN/PRC-117G Multiband Networking Manpack radio featuring the Mobile User Objective System (MUOS) Satellite Communications waveform.

In December 2019, the Marines evaluated MUOS and the software-upgraded AN/PRC-117G during a series of exercises at *Steel Knight 20*. There, the warfighters from the 1st Marine Division conducted a series of scenarios across multiple training sites in California and Arizona designed to simulate operations against peer and high-capability adversaries.

"Adding this capability to the 117G enables the Marines to leverage the proven radios they have already deployed, fought and trained with to access the advanced capabilities and capacity of the MUOS satellites with a simple software upgrade," Dana Mehnert, president of L3Harris Communication Systems, said. "The MUOS upgrade also enables interoperability with other U.S. DOD and allied users who deploy this advanced capability."

Exercise Steel Knight 20 included the longest-range raid exercise in 14 years. It included 29 aircraft that transported ground troops from Marine Corps Air Station Camp Pendleton, California, to a simulated combat zone in Yuma, Arizona. Transmitting and receiving near-real-time updates during the long-range movement to the objective, the raid force commander was able to adjust and plan his raid based on any changes. The Beyond-Line-Of-Site (BLOS) and On-The-Move (OTM) capability offered by the AN/PRC-117G and MUOS led to a successful raid on the objective and met the commander's intent for digital interoperability and Command-and-Control On-The-Move.

Scenarios, which were designed to demonstrate Command-and-Control (C2) connectivity throughout entire mission threads, saw MUOS employed throughout simulated congested and contested battlespaces. AN/PRC-117Gs were operated by dismounted Marine Rifle Squads in addition to being integrated on board a variety of Marine-specific platforms, including MV-22 Osprey Tilt-Rotor air frames, HMMWVs, and Light Armored Vehicles – the latter of which were used to support amphibious assault operations.

The exercise followed seven months in which U.S. Marine Corps Systems Command conducted a series of end-user evaluations designed to assess the latest version of the MUOS SATCOM system.

THE GAME-CHANGER

“This thing has been a game changer,” Maj. Gen. Robert Castellvi, commanding general of the 1st Marine Division, said of MUOS during a speech at the annual West 2020 conference earlier this year. “It has bridged the digital divide gap we have between our higher headquarters, that require high-bandwidth systems into the battalion, and below command posts that are dependent on very narrowband systems...It fared remarkably well.”

MUOS’ robust quality on the L3Harris terminals allows warfighters to communicate seamlessly when on the move, without needing to stop the mission to point antennas to regain communications, according to Marty LoBiondo, L3Harris’ product line management waveform director.

“It allows users to stay connected even in sub-optimal conditions,” he said. “MUOS provides the warfighter with significantly enhanced capabilities that enable new tactics, techniques and procedures for communication Beyond-Line-Of-Sight.”

Further, MUOS has allowed M777 and HIMARS artillery assets to coordinate fires from longer distances with fewer assets, Robert Brown, L3Harris’ lead sales engineer for Communication Systems, said.

Brown also highlighted the significant increase of MUOS in the Air Combat Element C2 community.

The MUOS terminal is much less burdensome on Marines than legacy SATCOM systems, Jeff Wrobel, L3Harris director of Navy and Marine Corps Business, said of the system’s operational advantages.

“Once you program and turn it on, you’re pretty much ready to go,” he said.

Sgt. Mason J. Roy, video chief for Communication Strategy and Operations at I MEF, echoed that sentiment, saying the operational advantages of MUOS were evident during recent field exercises.



“The idea that we can send a video or photo from the field to a command post [using MUOS] shows we can rapidly inform commanders with visual information so that commands could potentially adjust battlespaces to promote mission accomplishment and protect our troops.”

The Marine Corps is expected to operate the MUOS waveform as it replaces legacy narrowband SATCOM capabilities. Designed to ship data from the tactical “edge” across the battlespace, MUOS relies upon a network of satellites in Geosynchronous Earth Orbit (GEO) in addition to base stations in Italy and Australia.

AN/PRC-117G UPGRADES

Upgrades to the AN/PRC-117G have enabled the Marine Corps to ensure an “easy MUOS upgrade across the Corps without recapitalizing its entire installed base of radio systems,” Wrobel said.

L3Harris has also designed three new antennas for operations on the AN/PRC-117G to support the upgraded MUOS waveform.

These omni-directional antennas provide end users with OTM communications. They negate any requirement for end users to “pan and tilt” antennas to align

with any of the four MUOS satellites currently in GEO.

The upgraded AN/PRC-117Gs had been optimized to support the MUOS waveform in extreme latitudes. Historically, armed forces have struggled to maintain Line-Of-Sight connectivity to GEO satellites in these areas.

Additional operational benefits of the upgraded MUOS waveform over legacy SATCOM systems include enhanced voice quality and data support.

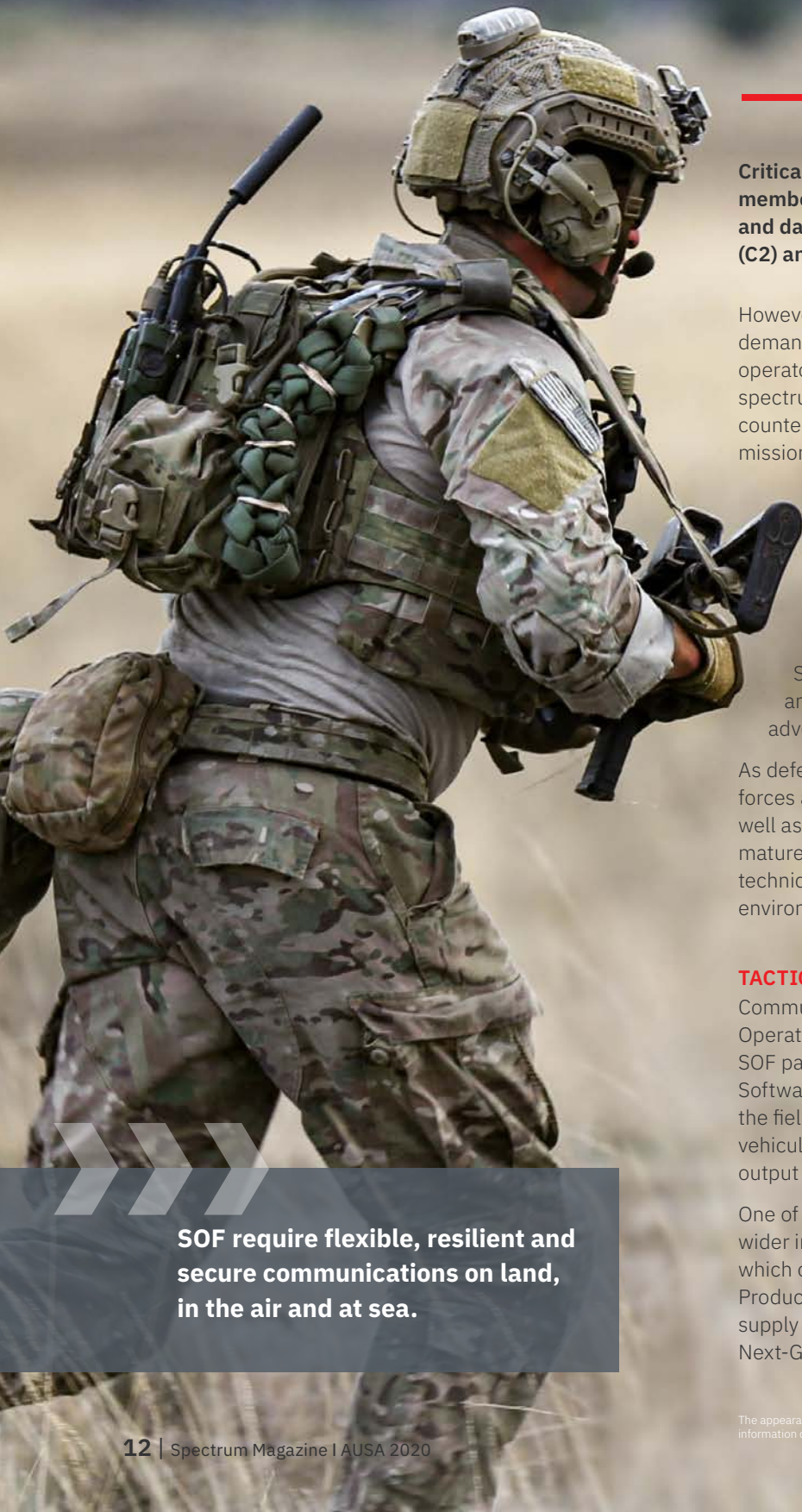
LOOKING FORWARD – NOW

The Marine Corps is focused on MUOS support of Marine Expeditionary Units (MEUs) in addition to naval vessels, according to Brown.

“The Marine Expeditionary Force has been doing a lot of work with the MEUs recently to integrate the MUOS capability aboard the Amphibious Readiness Group ships,” he said.

The AN/PRC-117G and AN/PRC-158 MUOS software upgrade provides the Marines with a greater number of SATCOM users, enhanced voice and data communication, as well as robustness in disadvantaged environments where they operate, such as urban and high/low latitude locations. ■

OSCAR MIC CHECK



Critical to any special operation is communication with every member of a team, requiring simultaneous access to voice and data communications to enhance Command and Control (C2) and Situational Awareness (SA) across the battlefield.

However, a rapidly evolving operating environment is demanding even more of Special Operations Forces (SOF) operators who can be tasked with conducting the full spectrum of operations, ranging from counterterrorism and counterinsurgency missions to the support-to-resistance missions associated with great power competition.

As a result, Special Operations Task Groups (SOTGs) operating on land, in the air or at sea are demanding flexible, resilient and secure communications solutions throughout operational theaters.

Nowhere is this more prevalent than along NATO's eastern flank in Europe, where U.S. and coalition SOTGs continue to have communications disrupted and/or intercepted by near-peer, peer and high-capability adversaries in the form of Russian armed forces.

As defense sources associated with Ukrainian SOF and armed forces attest, Russian armed forces across the border, as well as proxy forces in the Donbas region, continue to employ mature electronic warfare concepts of operation, and tactics, techniques and procedures to create a C2-disrupted or -denied environment.

TACTICAL SOLUTIONS

Communications solutions available to the U.S. Special Operations Command (USSOCOM) as well as international SOF partner forces around the world range from handheld Software Defined Radios (SDRs) capable of being upgraded in the field with new waveforms and software, to larger manpack, vehicular and airborne radios that provide greater levels in output for enhanced range.

One of the largest SDR providers to USSOCOM as well as the wider international SOF community is L3Harris Technologies, which on Nov. 21, 2019 received its latest \$86 million Full-Rate Production order as part of an overall \$390 million contract to supply the command with Falcon® IV AN/PRC-163 Next-Generation Tactical Communications (NGTC) SDRs.

SOF require flexible, resilient and secure communications on land, in the air and at sea.

The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.

Speaking to *Special Operations Outlook*, Jeff Kroon, L3Harris vice president of Tactical Communications Engineering, illustrated a series of demand signals arising from the special operations communications market that led to the development and continued upgrade of the AN/PRC-163 NGTC.

“Globally, SOF users rely on communications to support mission flexibility, resiliency, operational effectiveness and safety,” Kroon said. “The focus is shifting from counterinsurgency missions to readiness amidst near-peer threats, thus increasing the need for resilience and protection from electronic attacks of all kinds.”

This shift is causing many countries to recapitalize their tactical communications solutions with the latest and greatest solutions in the market, according to Kroon. This means new radios, new waveforms and new levels of security.

“Resilience, survivability and adaptability are key aspects to communications in modern warfare, and new requirements for cyber hardening are vital as the tactical IP network extends to the edge,” Kroon said.

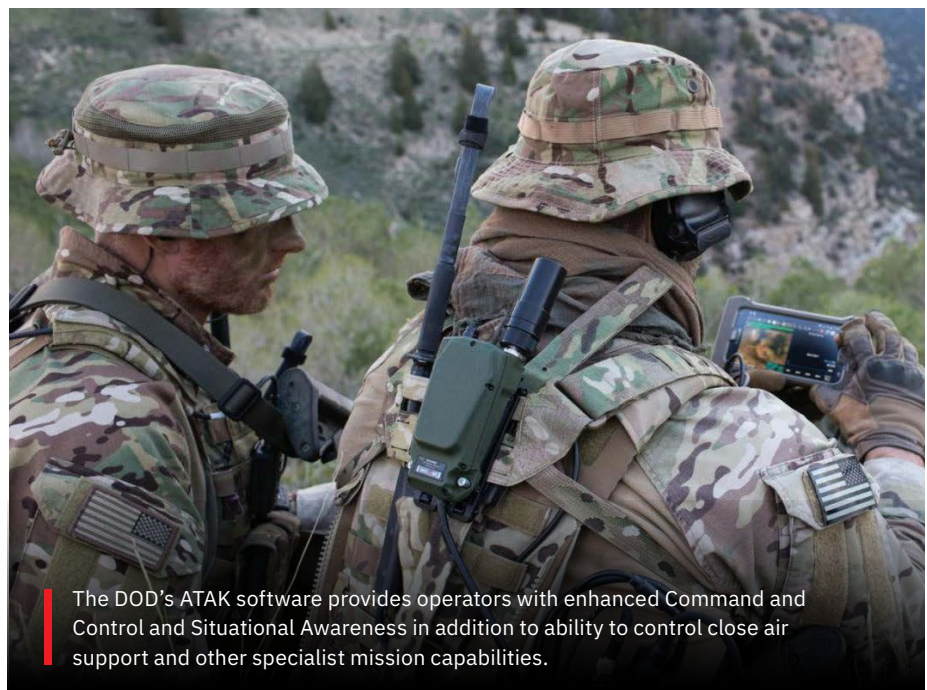
Specifically, L3Harris has warned how legacy IP-based waveforms and radios with inadequate security now represent a vulnerable entry point to an otherwise secure network that extends to a larger wide area network throughout the modern battlespace.

“Type 1 NSA-certified encryption is paramount in protecting these tactical edge networks, and, in turn, the entire wide area network to which it connects,” Kroon said. “Uncertified equipment, such as commercially available and programmable radios, are not government tested for vulnerabilities such as malware introduction, spoofing or other types of electronic threats that could compromise SOF operator safety. SOF requirements around the world are transitioning to fully resilient communications waveforms and cyber-protected hardware assets.”

ENHANCED CAPABILITY

The introduction of the AN/PRC-163 NGTC provides a significant step-change in the tactical communications capability of SOF operators across USSOCOM. The dual-channel SDR is supported by the TSM-X™ Mobile Ad Hoc Network (MANET) waveform, which is capable of connecting more than 200 nodes across a battlespace into a single mesh network.

The SDR provides multi-channel communications and can be connected to L3Harris’ ISR video mission module to support close air support and joint fires support, for example.



The DOD’s ATAK software provides operators with enhanced Command and Control and Situational Awareness in addition to ability to control close air support and other specialist mission capabilities.

In October 2019, L3Harris announced the first Full-Rate Production order for the AN/PRC-163.

“We are delivering these two-channel handheld radios at an escalating pace to meet the increasing demand,” Kroon said. “As with any of our Software Defined Radios, the AN/PRC-163 becomes more capable with every new firmware release. The introduction of new mission modules, like the ISR Generation 2 mission module, allows the rapid insertion of new capabilities into the tactical formation without the need of a separate device, additional connectors or batteries.”

AN/PRC-163 SDRs can also be networked to the Android Tactical Assault Kit (ATAK), which was designed by the U.S. Department of Defense as a software solution to be viewed on end-user devices including smartphones.

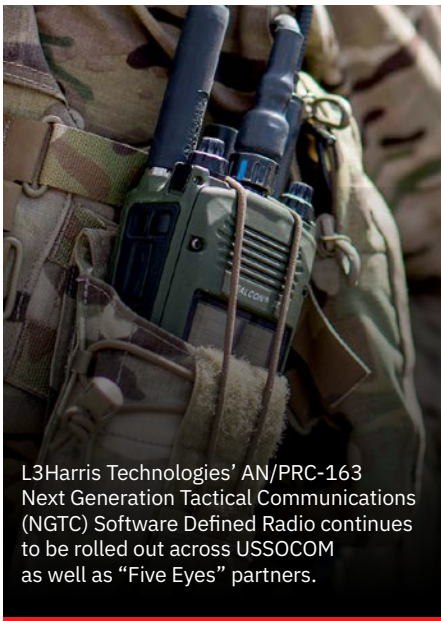
ATAK-enabled smartphones are already in service throughout USSOCOM and the wider international SOF community, providing operators with a “secure, mobile, interactive geospatial tool [and] common operational picture,” according to a USSOCOM spokesperson.

USSOCOM personnel generally wear ATAK as a chest-mounted solution or as a standalone end-user device used to support tactical chat, Link 16 datalink connectivity, HALO/HAHO military freefall, route planning and navigation, in addition to radio controls, the spokesperson added.

Traditional VHF/UHF (30-512 MHz) Line-Of-Sight communications will remain the backbone of all SOF communications, on the ground and for ground-to-air coordination.

“We are seeing the convergence of ISR and tactical communications

Continued 



L3Harris Technologies' AN/PRC-163 Next Generation Tactical Communications (NGTC) Software Defined Radio continues to be rolled out across USSOCOM as well as "Five Eyes" partners.

solutions into a single tactical communications ensemble on the operators," Kroon said. "MANET [waveforms] are gaining momentum and extending tactical IP networks to the edge. Every operator can be equipped with a radio and an End User Device."

Dual-channel handhelds provide the ability to support 30-512 MHz, Satellite Communications, tactical MANETs and ISR in a single device, providing the flexibility and adaptability that the dynamic SOF operator needs for all stages of a mission, while removing the need to carry multiple legacy devices. The demand is out there for faster frequency hopping, faster data and more resilience, and new waveforms are always under development by governments and industry.

"As new waveforms are developed and released, the multi-channel devices are well equipped to allow the introduction of new capabilities into the tactical networks while still providing a fallback plan or interoperability with adjacent conventional forces or partner forces," Kroon said.

PACKED UP

SOF commands within NATO and the "Five Eyes" community are seeking to maintain interoperability with USSOCOM partner forces; meanwhile, L3Harris continues to develop the manpack

variants of the AN/PRC-167 NGTC, also contracted to USSOCOM.

Company officials said the new dual-channel manpack was planned to be unveiled to the market at the SOF Industry Conference in May 2020. However, SOFIC was canceled due to the COVID-19 pandemic and was changed to a virtual conference. L3Harris described the new technology as a "game changer" for USSOCOM force components.

The Polish Special Operations Component Command (POL SOCC) received four Sikorsky S-70i Black Hawk helicopters in December 2019 as it seeks to maintain similar levels of interoperability with its USSOCOM partners.

Industry sources associated with the POL SOCC said the organization is seeking to upgrade the airframe's communications solution with L3Harris SDR technology to ensure interoperability with the remainder of POL SOCC's communications devices, as well as U.S. and international SOF partners.

According to Poland's Defense Minister Mariusz Blaszczak, the procurement of the airframes will "ensure interoperability with the rapid reaction forces of NATO."

SOF commands, including the Swiss Special Forces Command (KSK) – which is in the process of upgrading force elements with a variety of SDR solutions – continue to upgrade their communications capabilities.

Maj. Marco Dâmaso, system portfolio manager for special units, Swiss Armed Forces, Armed Forces Planning, said the KSK is interested in the capability to run battle management system software as well as capacity to support navigation in C2-denied or -degraded environments. A competition will be initiated in 2021, with program completion by 2025.

Additionally, active-duty units within the KSK, which include the Army Reconnaissance Detachment 10 and Military Police Special Detachment Unit, are expected to evaluate MANET High Data Rate personal radios with the aim to "increase connectivity and allow potential new capabilities" in the future.

Dâmaso also highlighted the interception and deception of tactical communications by Russian armed forces operating in Ukraine as well as demand signals to support urban operations in contested environments.

"Today, there are several solutions to enable the tactical non-GNSS [Global Navigation Satellite System] navigation and localization through inertial, RF [radio frequency]-based and smartphone-based solutions," he said.

Finally, the threat of Low Probability of Intercept/Detection by peer adversaries across the contemporary operating



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environment continues to drive a resurgence in High Frequency (HF) throughout the SOF community, which is driving some NATO forces to continue to pursue requirements for such a capability that is harder to disrupt and comprises a low-cost alternative to Satellite Communications (SATCOM).

“Special operations forces around the world continue to invest in HF communications,” Kroon said. “HF radios are now smaller and faster than previous generations. With innovations in the areas of resiliency and wideband data, HF offers more flexibility to the SOF community than ever. HF can

support the backhaul link as well as intel from the edge.

“These new innovations, combined with modern encryption algorithms and backward-compatibility with legacy HF systems, are driving many SOF organizations to modernize their HF fleet,” he added. “Concerns about SATCOM-denied environments also drive many users to HF. HF nets have no single point of failure, and that’s the flexibility that SOF communicators require.”

As USSOCOM and international SOF partners continue to urgently predict and equip for an uncertain future

operating environment, the importance of secure, resilient and flexible tactical communications looks set to remain a priority for commanders moving forward – especially given that they are a “gateway” to the enabling of next-generation capabilities, including Augmented Reality and Artificial Intelligence/machine learning-assisted decision-making. |

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WATCH
163 VIDEO



“We are seeing the convergence of ISR and tactical communications solutions into a single tactical communications ensemble on the operators. MANET [waveforms] are gaining momentum and extending tactical IP networks to the edge; every operator can be equipped with a radio and an end user device.”

Jeff Kroon

Vice President, Tactical Communications Engineering
L3Harris Communication Systems



THE HF COMMUNICATIONS RENAISSANCE

As combat environments, including space, become more contested, military customers require easy-to-use robust, cost-effective Beyond-Line-Of-Sight communications in the absence of satellite availability.

U.S. armed forces have renewed interest in L3Harris Technologies' high-frequency communications solutions, including the Falcon III® AN/PRC-160 High Frequency (HF) radio. The U.S. Army announced last October that it had ordered more than 1,500 AN/PRC-160 HF radios. The U.S. Marine Corps followed suit that December and informed L3Harris of a \$50 million follow-on delivery order for the radios as part of its High Frequency Radio II (HFR II) modernization program. And, in March 2020, the Marine Corps awarded L3Harris a five-year, \$383 million ceiling, single-award Indefinite Delivery, Indefinite Quantity (IDIQ) contract — with an initial delivery order of \$89 million — for Falcon III AN/PRC-160 HF radios as part of its High Frequency Radio II program.

“HFR II will fill much of the same needs that the legacy HFR system provide: long-haul communications, and the primary backup mode of communications in a Satellite Communications-denied environment,” Leigh King, Marine Corps Systems Command's project officer for the HFR II, said in a Marine Corps Systems Command press release.

As the global leader in tactical communications, L3Harris Technologies is on the cutting edge of advancements in HF communications. Through continuous innovation, our radios and related equipment deliver new and enhanced capabilities never before possible with legacy HF radios.

L3Harris' high-frequency radio solutions provide On-the-Move communications in satellite-denied environments.

HISTORY, ADVANTAGES AND CHALLENGES

High-frequency radio communications have been an element of civil and military communications for decades. With the inherent ability to communicate at distances that span the globe, HF has provided an accessible and versatile tool for long-haul communications. During World War II, for example, HF communications were the primary means for ship-to-shore and ground-to-air communications. Adjusting HF and antenna orientation enables radio waves to either traverse the ground (ground or surface wave) or refract off the ionosphere (sky wave); this flexibility results in communications that can penetrate thick tree canopies, reach into valleys and provide reliable voice communications over long distances.

Effective HF communications have been seen as a skill to be mastered. An understanding of environmental conditions, antenna takeoff angle, signal amplification and frequency propagation are all elements to consider for successful communications over HF. When any one of these elements is miscalculated, communications will be unsuccessful — for instance, selecting a high-HF frequency with the wrong antenna takeoff angle could result in radio waves piercing the ionosphere and never refracting to desired receive radio. Though HF has been a powerful tool, it has taken mastery of communicators to harness the power.

Legacy HF systems were typically limited to relatively narrow bandwidth allocations. In the past, HF radios utilized bandwidth in the range of 3 kHz, which is sufficient for voice and low data rates but lacks the



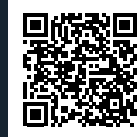
The AN/PRC-160 is a modern solution for Beyond-Line-Of-Sight communications in a satellite-denied environment. It is the smallest, lightest and fastest wideband HF manpack available — providing 10X throughput over legacy systems. The wideband system also is the world's only HF manpack meeting new NSA crypto-modernization standards.

capacity for more robust and resilient data transmission. Today's HF radios are vastly more capable of transmitting both voice and data, while additionally offering the resiliency needed by forces in contested environments.

THE CUTTING EDGE OF HF RADIOS

In 2012, L3Harris delivered the RF-7800H-MP, the first wideband HF manpack with bandwidths up to 24 kHz and data rates up to 120 Kbps. This radio was specifically designed to provide HF advantages for international partners.

As the next-generation HF radio system was being designed for delivery to the field, L3Harris purposefully took into consideration the 130 countries around the world where legacy HF systems were deployed. L3Harris designed a solution that could leverage the existing infrastructure and ease the technical and logistical burden of upgrading; installations could be left intact — all ancillaries, including antennas, antenna couplers, power amplifiers and cables, could be reused — and reap the benefits



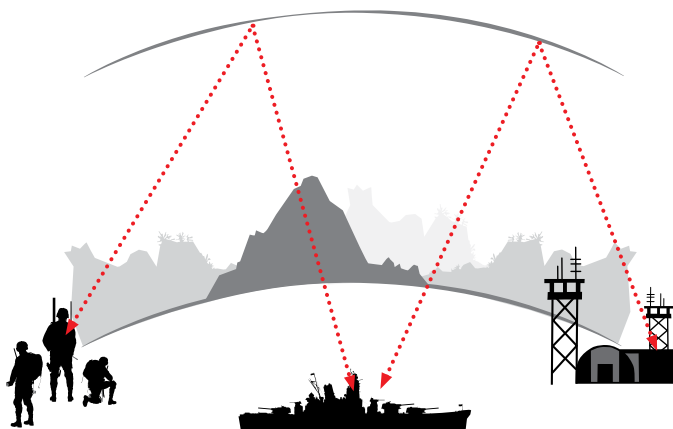
LEARN MORE ABOUT FALCON RADIOS

of a modernized HF system. Additionally, L3Harris designed its wideband HF manpack with the intelligence to downgrade real-time to a narrowband STANAG 4538 system for legacy interoperability. These design choices showcase L3Harris' commitment to innovation and commitment to making HF more powerful and easier for the warfighter to use.

In 2017, L3Harris announced the release of the AN/PRC-160, the first wideband HF manpack meeting new NSA crypto-modernization standards. Its software-defined architecture allows waveform and encryption updates, giving mission-critical information added layers of security and future extensibility. Consistent with the versatility and power of HF, L3Harris focused its internal development funding to pursue extremely robust and resilient waveforms to be used across the battlespace.

COMING NEXT

L3Harris has led major developments in tactical communications over many decades and continues to push the envelope by adding even more resilient waveforms and last-ditch voice and data capabilities to the software defined architecture. While HF may represent one of the oldest means of long-distance voice communications, make no mistake, HF is in high demand and offers enduring value to the warfighter. |



Adjusting HF frequency and antenna orientation enables radio waves to either traverse the ground (ground or surface wave) or refract off the ionosphere (sky wave).



PROTECTED SATCOM:

DOMINATING THE MODERN BATTLEFIELD

As armed forces demand optimal levels of connectivity across increasingly contested operating environments, L3Harris Technologies continues to extend its capability to provide protected Satellite Communications to customers around the world.

Customers worldwide are becoming increasingly concerned about the proliferation and emerging sophistication of threats across the Electromagnetic Spectrum and their potential effects on Satellite Communications (SATCOM) capabilities, according to L3Harris Technologies officials.

However, as Don Claussen, L3Harris' vice president and general manager of Army, International and SATCOM programs, explained, protected SATCOM should be viewed as a "huge game changer" for armed forces seeking to overcome these challenges.

Protected SATCOM is a "key driver" in dominating the modern battlespace, according to Claussen.

"In order to do that, you have to communicate and know your adversary is going to try and deny communications," he said. "So it's critical that we have protected SATCOM and Line-Of-Sight communications."

As electronic warfare threats continue, shielding communications from jamming and inclement weather is extremely important, he added. But, there's a cost associated with this: the more

an organization needs to spread its communications, more bandwidth is required.

"That's why there has to be a two-pronged approach to protected SATCOM, reliant upon bespoke systems in addition to capacity being put up by commercial providers, especially in Ka-band," he said.

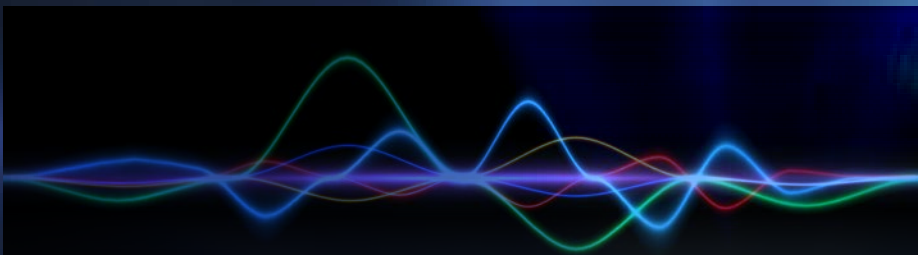
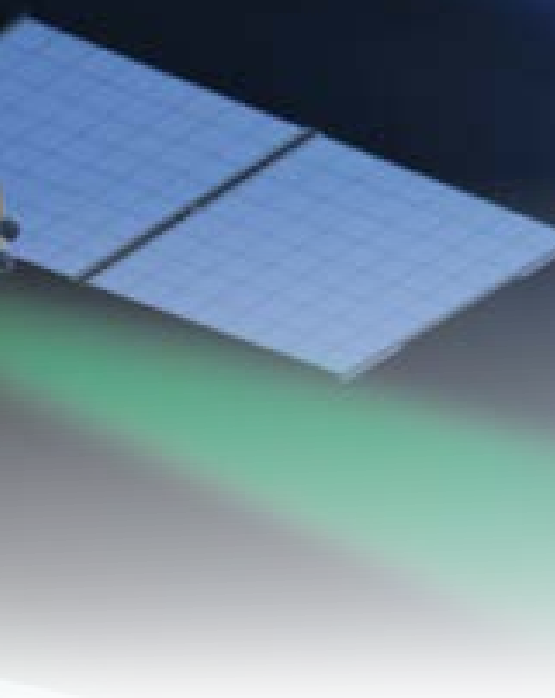
Protected SATCOM can be ensured through the development of specialist waveforms as well as diversity in transmissions achieved through the deployment of highly customized satellite constellations and ground architectures.

As an example, L3Harris continues to support the U.S. Air Force's Protected Tactical Enterprise Service, which includes the company's Protected Tactical Waveform and Network Centric Waveform Resilient – both of which provide the end user with anti-jam capabilities.

In April 2020, the U.S. Space Force's Space and Missile Systems Center awarded L3Harris a \$500 million contract to supply the Air Force and Army Anti-Jam Modem, which will provide warfighters with a secure, wideband and anti-jam SATCOM terminal to enable tactical communications in contested environments.

The deployment of the modems, which represents an important part of L3Harris' growing Protected Anti-Jam Tactical Service Enterprise, allows armed forces to share critical mission data via resilient and secure SATCOM in the face of jamming by high-capability adversaries.

Considering how diverse ground architectures can also enable protected SATCOM, Claussen said L3Harris continues to explore multiple terminal concepts operating in Ka, Ku and X bands, capable of aggregating data so spacecraft can spread it across multiple hub nodes.



BROADBAND COMMUNICATIONS SOLUTIONS

L3Harris Technologies Broadband Communications capabilities provide secured mobile networked communications equipment and integration to meet a wide array of U.S. military mission requirements.

Air Force and Army Anti-Jam Modem (A3M)

A3M provides the Air Force and Army with a secure, wideband, anti-jam Satellite Communications terminal modem for tactical SATCOM operations. L3Harris modems are optimized for high-rate production and are designed to become an integral part of the service's growing Protected Anti-Jam Tactical Service enterprise. Earlier this year, the U.S. Space Force Space and Missile Systems Center awarded L3Harris a five-year, \$500 million ceiling IDIQ contract to use the modem for its branch's operations.

Protected Tactical Waveform (PTW)

Several airborne and ground-based platforms and thousands of terminals across the U.S. Defense Department have been identified as transition candidates to the Protected Tactical Waveform.

A3M directly supports the U.S. Air Force's Protected Tactical SATCOM and increases anti-jam and communications capacity for joint tactical warfighters in contested environments.

The Protected Tactical SATCOM program will implement PTW over a transponded satellite and a future fully processed satellite, enabling adaptive, anti-jam communications channels, which will provide some of the highest levels of protect for tactical U.S. and coalition/international partner warfighting efforts.

Claussen highlighted activities of commercial SATCOM providers including SpaceX, which continues to develop its Starlink Low Earth Orbit constellation to deliver low-latency and broadband internet to consumers anywhere in the world.

"Starlink has distributed ground stations similar to a cellular model, which are geographically dispersed providing it with some real resiliency there," Claussen said. "An uplink jammer is not going to be able to cover all that ground."

L3Harris is currently supporting a similar concept on behalf of the U.S. Army with SpaceX and SES. The Multi Orbit Satellite Service program is scheduled to be demonstrated to the Army in October 2020. The goal is integrating commercial and bespoke protected SATCOM networks in Low Earth, Medium Earth and Geosynchronous orbits.

"Industry as a whole has to come together – we have all of these specific DOD programs that we are pursuing for protected SATCOM, but, at the same time,

we sometimes need to partner to deliver the best solution," Claussen said. "That's our focus, and I think we are doing an extremely good job delivering it."

Similar thoughts were shared by Loran Simper, vice president of Air Force and Classified Programs within L3Harris' Broadband Communications Systems, who said the company continues to invest in Low Probability of Intercept/Detection waveforms that allow end users to communicate undetected in contested environments.

"Both L3 and Harris were working this capability in different avenues, so following the merger, we were able

to take the best of breed from both companies to provide an optimal solution for our government customers," he said.

Simper also identified the growing number of classified protected SATCOM programs emerging from the defense and security sector.

"This is a great growth area for L3Harris, and we are witnessing a tremendous uptick in satellite procurements, mainly in the classified area," he added, noting work included developments in crosslink technology, protected waveforms and processing capabilities on-board spacecraft. |

EXPANSION IN THE UNITED KINGDOM

One year removed from L3 Technologies' merger with Harris Corporation, the unified company, L3Harris Technologies, is pressing ahead with business expansion plans in the United Kingdom.

Today, L3Harris employs approximately 1,700 personnel across 10 sites in the United Kingdom, focused on the delivery of a wide range of defense and security capabilities to the Ministry of Defence (MoD) and other government agencies, as well as supporting a broad European customer base.

Spread across the four business segments of L3Harris Technologies, the U.K. businesses operate in land, air, sea, space and cyber domains.

The business is in "good shape" in the face of the ongoing COVID-19 pandemic, which brought most of the United Kingdom and Europe to a near-standstill this past spring, according to L3Harris UK vice president Graeme Mackay, who is tasked with assisting the coordination across these business segments.

Mackay outlined L3Harris UK's role in cyber security and ensuring resilient connectivity across the contemporary operating environment.

"L3Harris UK is ideally positioned to support the MoD's requirements for



protecting communications, especially as the world becomes an 'Internet of Things,'" Mackay said. "We are very keen to provide protection as people move around huge amounts of data."

L3Harris UK also highlighted strong growth potential in its Communication Systems segment. Keith Norton, L3Harris UK's vice president of Europe and Canada, said there is "great potential" moving forward post-merger.

In September 2019, the Communication Systems segment moved into a purpose-built 80,000-square-foot facility in Farnborough, Hampshire – the United Kingdom's defense and aerospace hub. With 50,000 square feet set aside for the production, assembly, repair and maintenance of secure tactical communications equipment, the factory space is "flexible and adaptable for whatever task we need to take on," Norton said.

L3Harris UK is currently under contract with General Dynamics UK to support and maintain the 50,000 BOWMAN tactical radios in service with the British Army.

"We are moving into a new era for our supply and support to the MoD as we transition into the MORPHEUS timeframe," Norton said.

MORPHEUS, the British Army's next-generation tactical communications program, represents a significant growth opportunity for L3Harris UK. This includes supplying combat-proven resilient tactical radios as well as repair and maintenance, waveforms, encryption and cyber security services.

"Our new \$100 million facility investment in Farnborough provides us with a solid foundation to support the MoD over the foreseeable future," Norton said. "U.K. forces need solutions to address the re-emergence of the near-peer EW threat. L3Harris' experience in defeating such threats across all domains provides us with the opportunity to directly feed this experience back to the UK MoD."

L3Harris UK is in full support of the MoD's Information Advantage strategy and is prepared to provide "significant capability enhancements through the provision of world-class adaptable and flexible solutions for the MORPHEUS program," he added.

The MoD has access to next-generation L3Harris tactical radio products developed in the United States as well as L3Harris UK's internal research-and-development expertise according to Norton. Tactical radios have moved on significantly from the BOWMAN era, and the company's radios are all now software defined.

"This enables us to make them future-proof by adding new waveforms post-procurement as threat, waveform technology and standards evolve," Norton said. "This gives greater confidence to procurers and moves away from being locked into one solution for the life of the equipment. Two areas where L3Harris has made significant advances are HF and multi-channel radios in both manpack and handheld form factors."

For example, the AN/PRC-160 HF/VHF manpack offers a vast throughput advantage compared to the BOWMAN HF, which was limited to 2.4 kbps. By contrast, the AN/PRC-160 supports 10 times the throughput of legacy HF systems and is a viable alternative to SATCOM for long-range data communications.

"Our multi-channel radios, such as the AN/PRC-163 handheld, combine two complete radios in a single chassis," Norton said. "These radios have the capability to run different waveforms



in different frequency bands, and they can also crossband within the radio. This allows them to be used as gateways linking different levels in the communications hierarchy."

For example, one channel could be on a tactical network with a robust waveform while the other channel could be on a mid-tier backbone or tactical satellite backhaul.

"It's a game changer in designing and deploying communications architectures," Norton said. "The ability to leverage from these advances across our product portfolio using our U.K.-based engineering and production facilities allows us to take this type of product and tailor to U.K. requirements. Our Farnborough facility is List-X-accredited, and we have U.K. security-cleared engineering resources so essential to MORPHEUS. In addition, interoperability for coalition operation is vitally important to all European nations,

and we offer interoperability with U.S. and other allied forces 'out of the box.'"

Additional areas of interest for the Communication Systems segment include the MoD's Future Beyond-Line-Of-Sight and SATCOM terminal requirements.

Across Europe, L3Harris UK is also engaging in opportunities in tactical communications modernization, including significant programs being undertaken in Germany, the Netherlands and Norway.

"Many European nations are looking at refreshing their tactical communications systems from the 'digitization era,' so right now there are a number of very large programs underway," Norton said. "We are taking a coordinated view across these, and we are architecting solutions based upon a common core with localized elements and features." |

"We are moving into a new era for our supply and support to the MoD as we transition into the MORPHEUS timeframe."

Keith Norton
L3Harris UK's vice president of Europe and Canada



RIDING THE WAVES DOWN UNDER



L3Harris Technologies demonstrated field-readiness of the newly developed Advanced Networking Wideband ANW2®D waveform during a large-scale demonstration at the Shoalwater Bay Training Area in Queensland, Australia.

Over five days and covering an area roughly the size of the state of Rhode Island, the L3Harris team tested the ANW2D waveform for data capacity, scalability and its ability to handle voice and data across an extended network.

“I think the collaboration working together with the ADF and companies, and, in this case, L3Harris is absolutely critical to the success of the program,” said Alan Callaghan, president and managing director of L3Harris Communications Australia. “We relish the opportunity, such as field exercises, to get with the end users and investigate and address issues and challenges as a team, which is what it should all be about – being one team.”

In the 12 months leading up to the activity, the L3Harris team supporting the Australia-based LAND 200-2 Tactical Communications Network (TCN) conducted two lab demonstrations involving 40 and 81 nodes.

But theories are for the lab, and practice is for the field — and, in this case the field could not be any more challenging. In addition to the long distances, the terrain at the Shoalwater Bay Training Area featured dense tropical and sub-tropical foliage, significant mountain ranges and steep canyons. None of the topography was friendly for sending radio signals between fixed positions, let alone mobile operators traveling along roads that were typically at the valley floor.



THE OBJECTIVE:

Demonstrate to the Australian Army that the ANW2®D waveform is field-ready to perform as a key asset in their future battlefield network.

“The digitalization of the TCN offers us that advantage, and, similarly when we get into weapons integration of the battle management system that the TCN enables, [it] is a real game changer,” said Col. Deane Limmer, director of the Land, Command, Communications and Control Program for the Australian Army. “The TCN becomes the glue in which we connect broader land capability.”

leave/join times and quality of service. In total, the technical objectives gave the Army a “real-world” assessment of the ANW2D waveform’s performance.

More than 20 L3Harris Australia employees provided radio installation, operation, training and field support. The Australian Army involved more than 40 uniformed and civilian personnel to provide logistics and direct technical

The ANW2D waveform and L3Harris radios were put to a true test when the exercise became very real. Brush fires forced the evacuation of all personnel and resulted in the early conclusion of the field demonstration. The AN/PRC-158 radios using ANW2D were then used to coordinate the evacuation. The radios’ GPS tracking and sharing capabilities were especially helpful to those directing teams to safe routes away from the fires.

While there will be similar exercises as the Australian Army builds its future battlefield network, the field demonstration provided the Army validation that the ANW2D waveform will perform as expected and demonstrated exceptional cooperation between L3Harris and the L200-2 Project Office. In continuous pursuit of excellence, the demonstration yielded helpful technical data and other takeaways L3Harris will use to refine the L200-2 TCN.

“Digitizing the Army is a very difficult thing to do,” said Limmer. “Certainly, the TCN tactical communications networks are at the heart of that challenge, and certainly, it is the core enabler for taking the next step in the Army’s digitization journey.” |



The demonstration involved 25 Australian Army Mercedes G-Wagon 6x6 vehicles, kitted out with AN/PRC-158 radios and using a customer-developed data analysis tool. During each activity serial, the vehicles were both mobile and static, simulating three combat teams and enabling the Army to test performance against six technical objectives: scalability, waveform ID performance, waveform queue management, capacity, network

support. Working together over 10 days, numerous exercises simulated realistic deployment patterns.

The combination of static and mobile nodes spread across a wide area, with varying terrain, stretched the network. The field activity successfully demonstrated the adaptability of the ANW2D waveform in different deployment scenarios and capabilities, such as simultaneous voice and data.





ONE TEAM. EVERY MISSION.

L3Harris delivers world-class solutions to the elite professionals who dedicate their lives to safety, security, rescue and freedom. We continue to elevate the standards of handheld, weapon- and helmet-mounted electro-optical night-fighting equipment deployed in the toughest environments. Our enduring mission is to deliver the industry's most advanced and integrated precision targeting, night vision and imaging solutions for a safer world.

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