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Elbit Systems awarded Israeli Ministry of Defense contract

Elbit Systems has been awarded a contract by the Directorate of Production and Procurement ("DoPP") of the Israeli Ministry of Defense ("IMOD") valued at approximately $70 million for the supply of Electronic Warfare (EW) systems. The systems, developed and manufactured by Elbit Systems EW and SIGINT – Elisra Ltd., to be delivered over a five-year period, will be installed on board all types of Israeli Air Force fighter jets.

Bezhalel (Butzi) Machlis, President and CEO of Elbit Systems, commented: “We are proud to provide the Israeli Air Force, recognized as one of the world’s most advanced air forces, advanced EW systems, covering the full range of fighter jets, and we trust that this win will further enhance our position as one of the world’s leading EW manufacturers. The modern global air combat arena is extremely challenging, and pilots are facing many new threats. Our systems provide a solution to a wide variety of current and future threats, and we hope that other customers will follow the IMOD and the Israeli Air Force and select our EW systems.”

Heron-1 UAS reaches 70,000 operational flight hours in Afghanistan

Israel Aerospace Industries’ (IAI) Heron-1 Unmanned Aerial System (UAS) recently marked its 70,000th flight hour in Afghanistan, after less than seven years of operation in the country. This follows Heron’s completion of 25,000 flight hours last month under German Air Force operations in Afghanistan.

After successful use in Afghanistan by several Western NATO members, including Germany, France, Canada, and Australia, this milestone demonstrates Heron’s compatibility with challenging conditions in various areas around the world.

In an announcement from the Australian Ministry of Defense, Senator David Johnston, the Australian Minister of Defense said: “The Heron is a proven capability—providing ‘eyes in the sky’ for our troops in the Middle East. The retention of the system following their withdrawal from Afghanistan will ensure that Australia remains at the forefront of this advancing technology.”

Heron-1 is a Medium Altitude Long Endurance (MALE) UAS that provides crucial intelligence, surveillance, and reconnaissance information in real-time to commanders and frontline soldiers. It has significant capabilities, such as carrying a wide variety of sensors, which are able to provide real-time information over a wide area for an extended period. IAI is continuously raising the bar by further improving this system, as the new generation of the Heron family is based on the vast knowledge and experience accumulated in over four decades of planning, developing, manufacturing and operating UAS. IAI’s UAS have reached over 1.35 million flight hours used by more than 50 global customers. The Heron family alone has accumulated more than 250,000 operational flight hours worldwide.

BAE Systems awarded US Air Force contract

The US Air Force has awarded BAE Systems a five-year contract to provide multiple agencies with a wide range of radar support services. The contract, for the Instrumentation Radar Support Program (IRSP), is valued at a total of $278.5 million and will be incrementally funded.

IRSP is a government-administered co-op program that BAE Systems has managed since 1985. It was established to provide support to several agencies with similar radar, telemetry, and optical tracking systems, as well as compatible missions. Today, IRSP supports more than 500 systems with work ranging from relatively simple logistical upgrades to complete depot-level overhauls.

“Our employees average more than 20 years of experience in test range operations, maintenance, and system sustainment,” said DeEtte Gray, President of BAE Systems’ Intelligence & Security sector. “This team of experts understands the IRSP mission and how to design, develop, and deliver cutting edge instrumentation support.”

The company will provide serviceable components and subsystems for 28 test ranges with radar, telemetry, and optical tracking systems around the world. IRSP provides services across the US Department of Defense, the US Department of Energy, NASA, and at least seven foreign governments.

The work will be primarily performed at BAE Systems’ IRSP component repair facility in Fort Walton Beach, Florida, and is expected to be complete by December 31, 2020. The Air Force obligated an initial $200,000 at the time of the award.

GMC
GA-ASI delivers final two RQ-1 Predators to Italian Air Force

General Atomics Aeronautical Systems has announced that the Italian Air Force (ItAF) has accepted delivery of two RQ-1 Predator® RPA systems, marking final deliveries of GA-ASI’s Predator A product line.

“With the delivery of these aircraft, GA-ASI completes over two decades of delivering Predator A capabilities to the United States and allied countries,” said Frank W. Pace, President, Aircraft Systems, GA-ASI. “Amassing over 2.1 million cumulative flight hours and featuring the highest Mission Capable Rate of any aircraft in the Air Force’s inventory, Predators will continue to keep warfighters safe by equipping them with unparalleled situational awareness for many years to come.”

The Italian Air Force is a leader in the utilization of Predator and MQ-9 RPA to support a wide range of Intelligence, Surveillance, and Reconnaissance (ISR) missions in Italy, over the Mediterranean, and in support of NATO operations. Italy is the first country in Europe to have achieved an RPA airworthiness certification. GA-ASI has been supplying the ItAF with these critical assets for more than a decade.

Airbus Defence and Space completes first mobile general ground station for NATO’s Alliance Ground Surveillance

Airbus Defence and Space has completed the first of its newly developed mobile general ground stations (MGGS) for the NATO’s Alliance Ground Surveillance (AGS). AGS is a NATO programme to acquire a NATO-owned and operated AGS core capability which includes five Global Hawk unmanned aircrafts (UAV) comprising airborne radar sensors, a ground segment comprising fixed, transportable and mobile general ground stations, and a support segment.

The mobile stations will exploit radar images acquired by the Global Hawk remotely piloted aircraft via a direct or satellite broadband connection. Additionally, data from all interoperable C2ISR (Command, Control, Intelligence, Surveillance and Reconnaissance) systems operated by NATO and its member states can be received and evaluated. The exploitation results will provide information about stationary and moving objects on the ground to the local unit’s commander and can be distributed as well within NATO forces.

The MGGSs are each integrated into two containers that can be transported by truck, aircraft, train or ship. NATO has ordered a total of six units, which will be delivered to its base in Sigonella on the island of Sicily, Italy. From there, the stations can be redeployed to NATO operating units worldwide as and when required.

Airbus Defence and Space has just presented the first mobile general ground station (MGGS) in its Friedrichshafen (Germany) premises to representatives of NATO, the 15 nations involved in the programme and the system prime contractor Northrop Grumman. The development of the MGGSs involves 11 industrial partners from Germany, the Czech Republic, Estonia, Latvia, Lithuania, the Slovak Republic and Slovenia.

Elbit Systems has been awarded a contract from an Asia-Pacific country to supply a comprehensive airborne solution for use in intelligence, surveillance, target acquisition and reconnaissance (ISTAR) missions. The contract, valued at approximately $50 million, will be performed over a three-year period by Elbit Systems’ ISTAR Division, which will be the prime contractor for this program.

The full scale solution will further develop the customer’s existing intelligence and surveillance capabilities, by upgrading Elbit Systems’ already-deployed, long-range electro-optical cameras and sensors, and supplementing them with SAR/GMTI reconnaissance systems.
The meteoric rise of the UAV has probably been the biggest success story in the military aerospace sector. Teal Group back this up by confirming that it is the ‘most dynamic growth sector of the world aerospace industry this decade’. Their 2015 market survey estimates that UAV production will soar from current worldwide UAV production of $4 billion annually to $14 billion, totalling $93 billion in the next ten years. Military UAV research spending would add another $30 billion over the decade.

“The market for UAVs looks very strong, increasingly driven by new technologies such as the next generation of unmanned combat systems, and the development of new markets such as civil and consumer drones,” said Philip Finnegan, Teal Group’s Director of Corporate Analysis and an author of the study.

High Integrity Data Links (HIDL) form a crucial part of unmanned aerial vehicles communications. The military rely upon these links for the secure transmission of video, imagery and data received by sensors on board the UAV. These links must be highly secure, encrypted and resistant to jamming and interference. They also allow complete command and control of the UAV (or multiple aircraft), and Beyond Line of Sight operations. In short, these data links underpin every UAV sortie.

Satellite communications are most frequently used to connect UAVs and the use of satellite bandwidth by the military purely for this purpose has skyrocketed in recent years as UAVs have soared in popularity. That said, satellite bandwidth is expensive and in short supply and militaries are looking for ways in which they can find alternatives to provide the same HIDL without the grab for bandwidth and in a more cost-effective way.

Roke Manor Research
As part of its Defence Growth Partnership (DGP), the UK Ministry of Defence is working with Roke Manor Research to develop an innovative data link solution capable of transmitting real-time images and video from Unmanned Aerial Vehicles (UAVs) using 3G cellular technology. Roke will design the world’s first high altitude data link to communicate directly with ground-based cellular infrastructure at a distance of more than 50 kilometres.

The low size, weight and power system could offer the military a cost-effective solution that maximizes intelligence gathering by delivering a high-bandwidth communications channel for real-time images and video. The system will use commercial-off-the-shelf (COTS) 3G hardware, which alone cannot successfully transmit from high altitude to a base station on the ground.

Adaptive beamforming technology
To achieve this, Roke will develop adaptive beamforming technology to intelligently direct the signal to a specific point on the ground to commercial cellular infrastructure, or to a dedicated military base station. Bob Dalgleish, Business Development Manager at Roke, said: “There is a great deal of interest worldwide in 3G cellular providing high data rate communications for the military and our system will be developed to meet the need not only for UAV to ground data links but to satisfy an increasing need for extended range terrestrial cellular communications systems.”

David Cole, Managing Director, said: “Winning this award reflects Roke’s track record of creating innovative solutions, using commercial technologies that deliver new capabilities that are of real value to military operations.”

The DGP £10 million Innovation Challenge was launched in March 2015, through the Centre for Defence Enterprise (CDE) together with the UK Defence Solutions Centre, with the aim of encouraging the development of innovative defence products with significant export potential. It is funded by the MOD and delivered through the Defence Science and Technology Laboratory’s (Dstl) CDE.

The exploration of new technologies that can fulfil the demands that the varied and significant amount of systems and sensors placed on board UAVs today makes sense. We have long heard about the fact that satellite bandwidth is expensive and the demand for it places strain upon militaries the world over. A solution that involves cellular technology could provide the answer to a problem that has presented a headache for military commanders for some time now.
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Evolving war games

Armed forces, no matter which country they serve, are drilled and drilled. They practice maneuvers and operations and scenarios over and over again to make sure that they are perfected. It is a significant part of military life and technology is taking it to new levels.

Training for the troops today is very different to what it was just a few years ago. The gaming industry has had a huge impact upon the military simulation arena and gaming techniques are being used to help simulate the battlefield environment, making it as lifelike as possible. This allows troops to involve themselves in a plethora of scenarios and to test theories of warfare without the need for actual hostilities.

Simulations can have varied levels of realism and can include political and social factors. Critics of simulations say that simulations are only an approximate representation of the real situation, but if troops are able to look at a variety of scenarios and have a specific idea of the way they should react, this puts them in a much stronger position if that situation were to arise in reality. The models used within the simulation are important and they determine the level of human involvement in the scenario in terms of decision making.

There have been significant advancements made in the gaming scene and new technological developments that enable lasers to be used, for example, instead of blank ammunition, a much more realistic scenario can be built up in simulation and training environment. This enables soldiers to hone their reactions and operational techniques both as individuals and as part of a team.

Simulation is also enabling the military to save money across the board. Live exercises are costly, and in this era of austerity, they can be difficult to justify on a frequent basis. Using simulation and gaming mechanisms, they may still carry out much needed military exercises that complement live exercises but at much lower cost. Simulation can be used across the whole spectrum of military exercises from battlefield exercises to medical scenarios and cyberwarfare.

Virtual training and simulation has come a very long way in a short time, like much technology today. Here are a few examples of the ways in which technology is making the simulation and training environment hugely flexible and addressable to a wide range of situations across the entire military.

The future of virtual training
Cubic Defense’s subsidiary, Intific, has been selected by the Defense Advanced Research Projects Agency (DARPA) to develop a virtual test bed for the agency’s Tactical Technology Office (TTO). The virtual test bed is intended to provide a realistic virtual training environment for the evaluation of squad-level-focused technologies to be developed under DARPA’s Squad X Core Technologies (SXCT) program.

In addition, the test bed would enable a cost-efficient and effective way to test concepts and systems in order to support combat and capability developers. It would also assist support research and development programmes.

Intific received the first phase award to begin developing a prototype-proof of concept of the virtual test bed. If successful, Intific in subsequent option phases would build in gamification features, increased capabilities and scalability. The overall effort has a potential value of more than US$5 million over approximately 33 months.

Intific has an extensive background in commercial software development, and the new virtual test bed would adapt the latest innovations in first-person gaming engines and add defence-specific scenario- and technology-generation systems. This innovation would allow users to quickly and accurately build new virtual equipment and test capabilities and tactics in order to perform rapid assessments and validations. The test bed would also amplify opportunities for concept development, testing and procurement of next-generation infantry equipment, including weapons, sensors and unmanned vehicles. The combination of game-based, virtual and realistic training applications of the test bed would accurately model real military systems for easier adoption and engagement with military users at the squad combat level.

As a concept testing tool, the new virtual test bed by Cubic’s Intific team is anticipated to deploy by Q4 of fiscal year 2017 to support US military forces with additional possibilities to support various Department of Defense programs in the future.

Field training
Saab’s ManPack 300 is a development of their ManPack 120 and GAMER family of deployable, mobile and fixed CTC-instrumented training systems. It is a real time system that enables exercise command and control, together with During and After Action Review/statistical analysis of instrumented company-sized forces. The system handles up to 300 players and has the same computing power as a full-scale system, but with significantly lower procurement and support costs.

It is designed to operate in a man portable or vehicle mounted mode. This means it’s a system that can travel with the area of interest as the exercise moves in the terrain.

This radio mobility enables Observer/Controllers to follow
a manoeuvre and actively view and control the unfolding action in real time. ManPack 300 allows the Instructor at any time during an exercise to quickly present a playback of the exercise on the display screen for a small group, or via a projector for larger audiences. The exercise can be selectively replayed, zooming in and jumping to sequences and events of interest. There is a comprehensive set of tools that can be used to enhance the feedback.

ManPack 300 supports field training exercises, Urban Warfare, Chemical, Biological, Radiological and Nuclear (CBRN) and Counter-IED training as well as Precision Gunnery Training. The system has a powerful Windows-based suite of exercise-control tools that enable on-the-spot control of field-simulated indirect fires, minefields, CBRN contamination, improvised explosive devices (IED) and reactive targets. Exercise players are displayed in 3D against a high-resolution 2D or 3D terrain background, providing a detailed real-time situational view of the battle flow and individual events.

In real missions the individual soldier is the key player. ManPack 300 provides that individual detail through realistic simulation of every personal event. With ManPack 300 you can access Saab’s complete range of products for both small and large scale combat training.

ManPack 300 supports instrumented tactical Urban Warfare training when used with Saab’s Urban Training Package. Buildings are displayed in 3D and instrumented players can be viewed inside – moving from room to room together with the simulated effects of direct/indirect fires and booby traps.

The expansion pack provides a virtual and/or live simulated CBRN threat to all players in the exercise. It provides near real-time monitoring of Player CBRN Status – use of protective mask and clothing, health status and contamination status.

This system has also been developed to meet the changing training needs of current and future IED threats and the wider aspects of Counter Insurgency (COIN). It tracks the movement of the exercise participants, vehicles and mine detectors and displays the action in ManPack 300 for During and After Action Review.

ManPack 300 supports Precision Gunnery Training from individual to platoon and troop level. It can be used for instrumented live fire as well as laser gunnery training and meets all requirements of live firing and evaluation in a cost effective manner.

The ManPack 300 system is housed in a one man lift rugged transit case. The system comprises of an Exercise Command and Control Console (EXCON) housed in a portable ruggedized PC type Laptop Workstation and a 3-channel MDAN 300 BS radio base station transceiver. The EXCON Workstation can be located in a vehicle or in a designated facility such as a tent, range tower or building.

The MDAN 300 Base Station can be remotely located in the vicinity of EXCON in a high position to optimize RF coverage e.g. a vehicle roof or placed high in building. There is also an optional 10m antenna mast that can be used to increase the
training area coverage when the system is used in a static configuration.

The ManPack 300 is not only versatile for its prime role but it is also designed to be a modular plug-in to the larger instrumented CTCs. This capability can extend an existing footprint or even permit a maneouvre element from another area to join the main exercise.

Cyber warfare
SCALABLE Network Technologies has introduced a version 1.1 of its Network Defense Trainer (NDT), an innovative cyber training system. SCALABLE developed NDT to integrate cyberspace operations and traditional kinetic warfare into full, instrumented, synthetic cyber warfare training environment. The NDT 1.1 release offers improved functionality that allows cyber warriors, network administrators and command and staff to train as they would fight, improving their awareness, reaction time and ability to take corrective action to work through degraded cyber environments and successfully complete missions.

“NDT 1.1 improves our system’s ability to train warriors for the combined cyber / kinetic battlefield. The new features permit a simpler-to-configure and even more realistic train-as-you-fight environment,” said Lloyd Wihl, SCALABLE’s Director of Technical Sales. “We will continue to make improvements to NDT to align with the continuously evolving cyberspace training needs.”

The NDT 1.1 release contains new features and performance improvements. Significant enhancements include enhanced integration with constructive simulations, built-in voice communications among the trainees, improved situational awareness including reports of network scanning, port scanning and signals intelligence and quicker deployment and reconfiguration including a new, simplified installer.

A vital part of military preparations
The simulation and training sector has become a pivotal part of military preparations and is a part of everyday life for today’s soldiers. The ability to play out different scenarios without the need for actual combat is the ideal situation. To be able to go back and review and analyse a scenario after the event gives commanders the opportunity to give detailed feedback to their troops. Not only this, but simulations offer a very cost-effective way of bringing different experiences to troops without the associated costs. Though there are critics of these training exercises, and they cannot replace real life exercises, they can certainly complement them, and enable troops to develop their range of skills and gain confidence for future operations.

Elbit Systems’ wholly-owned subsidiary, CYBERBIT Ltd. (“CYBERBIT”), was awarded a contract to provide the Switzerland-based company RUAG Defence, with its CYBERBIT CyberShield-Cyber Security Trainer and Simulator (T&S). The contract is in an amount that is not material to either party and the T&S will be supplied in the coming months.

The CyberShield Simulator enables users, individually or as a group, to detect, respond and prevent cyber attacks, while experiencing advanced up-to-date attacks, under real network protection conditions. The simulator provided to RUAG Defence will also present various network protection scenarios, conduct follow-up debriefing and evaluate the results. The system will enable simultaneous training for multiple users on attacks directed at IT networks as well as industrial control networks (Supervisory Control and Data Acquisition - SCADA) used in most utilities.

RUAG Defence will use the CyberShield T&S as a basis for further development, before integrating it into the company’s comprehensive Cyber Training capabilities. RUAG Defence’s Cyber Training Services are based on long experience in both the fields of cyber security and training support. Currently, training is offered to military and civilian organizations, and covers a range of needs from technical specialists to senior directors.

The cyber simulator for civilian application, an original CYBERBIT development, is based on the company’s extensive experience in cyber protection for defence customers, as well as its proven air, sea and land training capabilities. CYBERBIT’s cyber simulators are already in use by customers in the Civilian and defence sectors, including the Israel Defense Forces.

Adi Dar, General Manager of CYBERBIT commented: “I am proud that we were selected to supply our cyber T&S to RUAG. The cyber threat on infrastructures is constantly increasing, bearing much potential impact on national as well as enterprises infrastructures. I am pleased that we can contribute and improve the capabilities of enterprises as well as governments to prepare and face this imminent and exponentially growing threat.”

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Hughes Defense and Intelligence Systems places enormous emphasis on opening up new areas of thought, research and development in satellite communications. The company also places great emphasis on partnerships with defence forces and companies to help enhance security, interoperability and efficiency across their mission-critical communications. Hughes Defense and Intelligence Systems has recently taken part in the Talisman Sabre military exercise. Helen Jameson speaks to Dan Losada, Senior Director of Defense Systems, about the exercise, the company’s technology and future plans.

GMC: Can we begin by talking about the Talisman Sabre exercise itself, what it entails and the reasons behind it?

Dan Losada: The Talisman Sabre series of exercises is a major Australian and United States military training exercise focused on the planning and conduct of mid-intensity “high end” warfighting. It takes place once every two years and this was the sixth time the Exercise has been conducted. It involved around 30,000 Australian and US defence personnel as well as forces from other regions. The Exercise incorporates force preparation activities, Special Forces activities, amphibious landings, parachuting, land force manoeuvre, urban operations, air operations, maritime operations and the coordinated firing of live ammunition and explosive ordnance from small arms, artillery, naval vessels and aircraft.

During the exercise they run through and simulate a scenario of some sort where there is an opposing force and a defending force. They set up communications and the associated kit, and they emulate a scenario to see how their technology responds.

It takes a couple of years to gear up for the exercise. The Australian Defence Force (ADF) use the exercise for training purposes and as an opportunity to test technologies that are deployable and ready for the force to use. Most of the technology has already undergone a number of field tests that are finalized with the Talisman Sabre exercise itself.

GMC: Can you tell me about Hughes’ partnership with the ADF?

Dan Losada: We work with the Australian Defence Force, mostly through the Army. For the most part, we work with the Army Headquarters Networking Group. The ADF runs a lab and a test environment where different technology can be trialled. The Group has been running analysis and studying migration into an IP-enabled, advanced satellite waveform to bring the Army up to the newer standards of satellite communications. It is part of their broader modernization exercise. This is happening across all technologies that they use, not just satellite. They make it very clear that they are still evaluating and studying all kinds of technologies for the migration, but we have been working with them for nearly eight years helping them to learn and understand the whole process and the best ways in which to utilize it.

GMC: Can you tell me about the part that the HX system plays and how it enhances the communications on the battlefield?

Dan Losada: The HX system is one of Hughes’ main product lines. We use it for a number of different customers, from commercial to military customers. It has a number of features that have been designed and developed to enhance it so that the military can use it while still maintaining its COTS characteristic.

At its core, the HX system is an enterprise grade satellite system for networks that require a hub and spoke or mesh architecture. You can easily operate the network in ways that suit the end-users and can connect multiple points through a centralized hub or those points can communicate directly to each other, if necessary, for low latency communications.

The HX system is based on the DVB-S2 technology that was developed by the DVB standard body, using a lot of the Hughes technology. It returns from the remote sites to the Network Operating Centre (NOC) using TDMA technology. The HX System also provides a number of features that the ADF is interested in, one being COTM. The HX system can be installed on ships, land vehicles or aircraft. It is already used on all those platforms today as well as on man-portable terminals. It also has a feature called transmission security that allows you to protect not only the data that’s flowing through the network but the management
and link layer information that is going across.

Another important feature is that the HX system is certified for use on the WGS satellite constellation. This is a US DoD satellite constellation, which the Australian Government bought into in a big way a few years ago. Any technology to be used over those satellites has to be fully certified, which the HX system is.

The HX system is also a migration path into our High Throughput Satellite (HTS) product line, which forms part of the newer discussions we are having with the ADF and other customers. There are a growing number of customers making the move from more conventional satellites to HTS, and so as we work with the ADF, we plan to integrate into their vision - the migration to HTS technology that Hughes has pioneered and is continuing to develop.

**GMC:** Do you think there is enough understanding of VSAT technology and its benefits by the military?

**Dan Losada:** It has been our mission to increase this understanding. The work that we have been doing with the Army Headquarters and the Land Network Integration Centre is helping us accomplish that. We have worked diligently to mitigate any of the concerns that some people have in migration to an enterprise grade system like Hughes HX.

A lot of concern exists in terms of applications. Will they work properly? There’s a lot of concern that exists with people that are used to having access to dedicated bandwidth and circuit-based communications. They are migrating into something where they do not control their RF channel and trusting someone else to give them an Mbps channel. They are gaining access to a performance-based system. The concepts of Quality of Service (QoS) and Quality of Experience (QoE) are completely new to them. Having their applications prioritized in a QoS environment was a real eye opener for a lot of the leadership there and we’ve seen a lot of concerns mitigated as we continue our mission. I think they believe that the migration can happen and today, the ADF and other military are evaluating what the best technology is to use and how and when do they start implementation.

**GMC:** In your discussion with the ADF and other forces - how open are they to HTS?

**Dan Losada:** Since they helped fund the WGS constellation, they don’t necessarily see themselves operating over HTS satellites in terms of purchasing part of a satellite. However, what they want to do is use ground technology that has been developed and designed for HTS satellites, over their satellites, and try to reap some of the benefits there.

There are some benefits of the newer technology that is coming out such as smaller Roll Off factors, higher order modulations, much denser gateways. So what used to take up fifteen racks of equipment now just takes up one rack of equipment. They can save space, which is at a real premium at their teleports. Even if they are not using HTS technology on the satellites, they can take advantage of the space it saves, making operations there more efficient.

Hearing that, there is a push towards service oriented HTS satellite solutions that they would like to start to benefit from. Rather than buying part of a satellite, they are looking at the advantage of the cost profile in some of these HTS managed services. It’s still in early stages, but we are hoping that they will move into this area as time goes on because of the benefits it can bring.

**GMC:** What kind of trends are evident to you in terms of the military at the moment?

**Dan Losada:** I think one of the strongest trends is that of protected satellite communications. We have had the TRANSEC feature available on our products for a few years now and it has been an important feature for us to have, but we have seen a significant uptick in requests for this feature now.

As you may know, the US Government and Air Force is launching a programme called Protected Tactical System that is basically developing new ground infrastructure, and some space segment in the future, to affordably protect communications to the broader DoD. We are also seeing studies happen within the ADF on protected satellite communications. It has always been a challenge, technically, but today it is becoming a reality as we see our opponents having the technology to jam our satellite communications or take advantage of the fact that we may be in an area where we do not have full spectrum control and we need to be able to operate in a manner to remain undetected.

We are also seeing a trend in the airborne ISR world to gain more efficient bandwidth solutions. One of those initiatives is trying to leverage HTS for airborne communications. In the commercial world, for example, Global Eagle Entertainment is upgrading into HTS architecture. We believe this will be
something that the military will eventually do, and has started doing in some capacity already. The benefits are huge because throughputs are much higher. There are some architectural challenges that come with HTS in terms of spotbeams and beam switching, which our ground segment can address, but certainly we’re seeing the military trying to benefit from HTS. The US Pathfinder programme, for example, is definitely displaying a great deal of interest in the ability to operate BLoS and other ISR solutions on HTS.

GMC: What can we expect from Hughes Defense and Intelligence Systems in 2016

Dan Losada: 2016 is the year we hope to reap the benefits of the hard work we have put in our R&D over the last few years, developing a new product line and also developing on-going relationships with our customers to support their more strategic network solutions.

This year we launched our HM System product line, which was created to meet the growth in challenging mobile satellite networking requirements. We have developed a high performance COTM modem (the HM200) and an ultra-compact X-band portable terminal (HM300) with a hub modem (HM100) that binds it all together. We believe that this new product line is capable of filling a lot of the gaps that exist out there for connecting today’s war fighters to meet requirements for protected communications and for more efficient, high throughput based ISR networks.

We have worked closely with Airbus DS on the XEBRA Service project as the exclusive terminal provider with our HM300. The HM300 satellite terminal offers a new level of portability for voice and data communications. The XEBRA Service, provided by Airbus Skynet5 satellite constellation, is a reliable and cost-effective alternative to L-band services in the market today. We believe this joint venture will be another very important part of what you see Hughes Defense and Intelligence Systems doing in 2016. Finally, you will see a lot of thrust from us into the airborne world. We have been forging some strong alliances with the main platform integrators such as General Atomics and Northrop Grumman. We have done some rotary wing tests and demonstrations for partners and clients. These will be the pillars for 2016: mobility and agility, we’re ready to go wherever the mission takes them.

GMC
As more businesses shift their operations and services online, satellite networks are proving their importance as they ensure continued connectivity during terrestrial network failures and offer more secure connections for high-security military and government operations.

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The NATO Communications and Information Agency NCI Agency was formed on July 1st 2012 and was the result of a merger of several agencies within the NATO structure: the NATO Consultation, Command and Control Agency (NC3A), the NATO ACCS Management Agency (NACMA), the NATO Communication and Information Systems Services Agency (NCSA), the ALTBM Programme Office and elements of NATO HQ Information and Communication Technology Management (ICTM). The establishment of the Agency was part of a broader NATO reform.

The NCI Agency provides NATO with the provision of advanced information and communications technology and C4ISR to the NATO community and is therefore a crucial part of NATO’s capabilities. Missile defence and cyber also falls within the NCI Agency’s remit. The capabilities it offers are acquired through a process of competitive bidding. This helps NATO to lower the cost of acquisition of these key technologies.

To strengthen the Alliance through connecting its forces, the NCI Agency delivers secure, coherent, cost effective and interoperable communication and information systems and services in support of consultation, command & control and enabling intelligence, surveillance and reconnaissance capabilities for NATO where and when required. This includes IT support to the Alliances’ business processes (to include provision of IT shared services), NATO HQ, Command Structure and NATO Agencies.

The NCI Agency optimizes NATO mission success and aims to be recognized as the trusted enabler of information superiority and enterprise excellence. The organization also uses best practice to develop, deliver, connect and protect capabilities in partnership with other NATO entities, nations and industry.

Main areas of focus of the NCI Agency are:

- Capability planning and C4ISR architectures;
- Exercises and training;
- Operations planning and execution;
- Joint intelligence, surveillance and reconnaissance;
- Integration support and value added services;
- Core services;
- Networked communications infrastructure services;
- Battle laboratories;
- Acquisition and procurement of advanced technology;
- Programme, portfolio and project management;
- CIS support to operations in Afghanistan – providing the NATO core of the Afghanistan Mission Network, the communications backbone for the Afghanistan mission, and command and control for the coalition;
- Keeping NATO Connected - enabling NATO personnel to connect to the ICT networks that they use on a daily basis. This includes providing secure and robust communications to the political decision-making bodies and Headquarters personnel, as well as the NATO Response Force and NATO operations in the Balkans and off the coast of Somalia;
- Combating Cyber Attacks - the Agency is NATO’s first line of cyber defence. It operates cyber defence capability development, the NATO Information Security Operations Centre and the NATO Computer Incident Response Capability (NCIRC) Technical Centre, providing integrated cyber defence 24/7, year round.

NATO’s Secretary General, Jens Stoltenberg has focused strongly during his term, on the concept of ‘Smart Defence’. In the era of austerity that we currently are operating in, Smart Defence focuses on cooperative ways to generate modern defence capabilities that NATO needs but in a cost-effective, efficient and coherent manner. Smart Defence encourages allies
to work together to develop, acquire, operate and maintain military capabilities to undertake their core tasks. The projects involved cover a whole host of capabilities including the areas of ISR, ballistic missile defence, cyber defence and precision guided munitions.

**MAJIIC and MAJIIC 2**

2015 sees the end of the NCI Agency’s MAJIIC 2 project. MAJIIC 2 is the follow-on initiative to the original MAJIIC project which, over five years, focused on leveraging and improving interoperability of intelligence, surveillance and reconnaissance capabilities through standardized technology and procedures. The project builds on the technology that was deployed in Afghanistan and aims to develop the benefits that this brought to troops and commanders who operated there, promoting enhanced information sharing and situational awareness.

The MAJIIC 2 project commenced in 2011. Nine nations – Canada, France, Germany, Italy, the Netherlands, Norway, Spain, the UK and the US, came together to form the Multi-intelligence All – source Joint Intelligence Surveillance and Reconnaissance Coalition.

As the project draws to a close, it is likely that the participating nations and the Agency itself will push for a follow-on project to MAJIIC 2 to ensure that future coalitions will be able to integrate, manage and access all national ISR capabilities.

MAJIIC 2 saw the wider development of technology that was used in Afghanistan. It is hoped that the project will enable the nations involved to share imagery more easily and rapidly from very expensive assets such as UAVs and surveillance aircraft. At the beginning of the project, Lieutenant Colonel Arle Brustad of Norway, Chairman of the nine-Nation project team explained: “By rapidly sharing imagery, we can avoid having multiple assets deployed in the same location, cover a significantly larger area, or cover a specific area for a longer period. In effect, what we get is more intelligence for our Euro.”

The MAJIIC 2 project is expected to bring a wide range of benefits to NATO. They include:

- Increased resource efficiency – allowing the nations to develop capabilities more quickly and operate more efficiently; to do more with less.
- Improved mission effectiveness – the ability to have timely and accurate information exchange at all levels supports more efficient and effective performance of operational tasks.
- Lower investment cost – through burden sharing during the development process, and potentially during acquisition.
- More Operationally effective utilization of technology – providing technology to support mission requirements, not just for technology’s sake.
- Risk reduction to future NATO Network Enabled Capability acquisition – through a common, operationally relevant development and test-bedding concept.

Additionally, MAJIIC 2 will also concentrate on the leveraging of assets for wider purposes such as border control and other civil applications such as farming.

**Smart defence for ground surveillance capabilities**

In the spirit of Smart Defence, and just one of a number of initiatives that epitomize this, NATO is acquiring the Alliance Ground Surveillance (AGS) system that will give commanders a comprehensive picture of the situation on the ground. NATO’s operation to protect civilians in Libya showed how important such a capability is. A group of Allies is acquiring five Global Hawk remotely piloted aircraft and the associated command and control base stations that make up the AGS system. NATO will then operate and maintain them on behalf of all 28 Allies.

The AGS system consists of air, ground, mission operations and support elements, performing all-weather, persistent wide-area terrestrial and maritime surveillance in near real-time. The AGS will be able to contribute to a range of missions such as protection of ground troops and civilian populations, border...
control and maritime safety, the fight against terrorism, crisis management and humanitarian assistance in natural disasters.

The AGS system also includes European-sourced ground assets that will provide in-theatre support to commanders of deployed forces. The AGS system is being acquired by 15 Allies and will be made available to the Alliance in the 2017-2018 timeframe.

The AGS Core will be an integrated system consisting of an air segment, a ground segment and a support segment.

The air segment consists of five RQ-4B Global Hawk Block 40 aircraft. The aircraft will be equipped with a state-of-the-art, multi-platform radar technology insertion programme (MP-RTIP) ground surveillance radar sensor, as well as an extensive suite of line-of-sight and beyond-line-of-sight, long-range, wideband data links. The air segment will also contain the remotely piloted aircraft (RPA) flight control stations.

The ground segment will provide an interface between the AGS Core system and a wide range of command, control, intelligence, surveillance and reconnaissance (C2ISR) systems to interconnect with and provide data to multiple deployed and non-deployed operational users, including reach-back facilities remote from the surveillance area.

The ground segment component will consist of a number of ground stations in various configurations, such as mobile and transportable, which will provide data-link connectivity, data-processing and exploitation capabilities and interfaces for interoperability with C2ISR systems.

The AGS Core support segment will include dedicated mission support facilities at the AGS main operating base (MOB) in Sigonella, Italy.

Contributions in kind provided by France and the United Kingdom will complement the AGS with additional surveillance systems. The composition of the AGS Core system and these contributions in kind will provide NATO with considerable flexibility in employing its ground surveillance capabilities.

This will be supplemented by additional interoperable national airborne surveillance systems from NATO member countries, tailored to the needs of a specific operation or mission conducted by the Alliance.

A joined up approach to defence
NATO is placing heavy emphasis on the development of its communications and information infrastructure. The formation of the NCI Agency has enabled them to refresh their approach and to focus on the need to be cost-effective yet efficient in the way in which they procure these types of capabilities. Initiatives such as MAJIIC and MAJIIC 2 are vital in terms of ensuring maximum information sharing and interoperability between NATO states. Without this level of cooperation and sharing of knowledge and technology, NATO would be unable to function successfully. By sharing both assets and information, and bringing down the cost of procuring the very best information and communications technology, NATO can operate its missions around the world in a much more coherent way.

GMC
Germany buys another 131 Boxers

The German Bundeswehr has contracted with Rheinmetall and Krauss-Maffei Wegmann to supply 131 Boxer armoured fighting vehicles. The order is worth euros 476 million.

On behalf of Germany’s Federal Agency of Bundeswehr Equipment, Information Technology and In-service Support, the international procurement agency Occar has placed an order with Artec GmbH – a joint venture of Rheinmetall and KMW – to supply an additional 131 Boxers configured for an armoured personnel carrier role. Delivery is slated to take place during the period 2017 to 2020.

Back in 2006, Artec booked an initial order for 272 Boxer vehicles for the Bundeswehr, the last of which will be transferred to the German military in March 2016. The contract encompassed command and control, medevac and driver training vehicles as well as APCs capable of transporting a complete infantry section/squad.

The Netherlands is also a partner in the cross-border Boxer programme, having ordered a total of 200 vehicles, including in this case a combat engineering configuration and an additional transport version.

Thanks to its composite add-on armour, the Boxer is one of the world’s best-protected 8x8 tactical vehicles. This wheeled armoured vehicle assures excellent protection from landmines, improvised explosive devices and ballistic fire, coupled with outstanding mobility both on and off road, even in the toughest terrain.

Powered by a 530 kW (720 HP) MTU turbo diesel engine, the Boxer – weighing up to 36.5 tonnes with a full combat load – attains a top speed of 103 km/h.

Featuring separate drive and mission modules, the Boxer design concept assures maximum flexibility and versatility. In the section/squad APC configuration, the Boxer serves as a 'mother ship' for up to ten troops. It is equipped with a remotely operated FLW 200 light weapon station featuring a 40mm automatic grenade launcher or 12.7mm heavy machine gun.

Operational experience in Afghanistan makes it clear that the Boxer significantly enhances battlefield sustainment and mobility of an infantry section or squad. The positive performance of the Boxer in deployed operations was a powerful factor in the German government’s decision to place the new order. GMC
At present, NATO is in the process of implementing what is known as Mode 5 – the latest version of the IFF system.

IFF enables the identification of aircraft, vehicles, vessels or forces as friendly and it can also determine the bearing and range from the interrogator. The concept was first developed during the Second World War. Although IFF can only positively identify friendly targets, it can be valuable as a decision making tool and is useful in terms of reducing incidents of ‘friendly fire’.

As mentioned earlier, IFF started out in the 1940s. In the 1960s the system was upgraded to include altitude reporting and cryptographically secure identification. This iteration of the system, also known as the Mark XII standard, incorporates Mode 4 IFF technology and this is still the standard used by the US and NATO countries. In the 1980’s Mode S emerged and this allows specific selective data communications that are added to support additional data and the collision avoidance system.

Since 1995, a new waveform for the IFF system has been in development and this is known as Mode 5. This will eventually replace the Mark XII Mode 4 IFF system. NATO ratified the new Mode 5 waveform in 2002. The new waveform utilizes a range of advanced technologies including modern modulation, coding, and cryptographic techniques to overcome performance and security limitations in the current Mark XII waveform.

Mode 5 systems also facilitates the capability to securely pass GPS position and other data through expanded data handling capabilities. The new system uses interference reducing spread spectrum techniques which allow the additional data transmissions to be overlaid on the existing ATC system frequencies without increased interference. All legacy modes and Mode 4 operational capability will be retained in order to facilitate an orderly transition to the new Mode 5 IFF waveform.

The Mode S equipment is also much smaller and lightweight – a main priority with military equipment today.

The Mode 5 systems have been in development for some years now, and systems will be used on wide variety of types of vessels, vehicles and aircraft. This is a huge task and all the systems implemented by each NATO state, will have to be interoperable and work seamlessly together.

UK MoD
From the UK’s perspective, defence companies Airbus Defence and Space, Thales, Raytheon and Selex are vying for position and awaiting the outcome of contract awards due to be announced in 2016.

In October 2014, The UK Ministry of Defence selected the Raytheon UK and Thales UK teams to conduct a one-year study into upgrading existing Identification Friend or Foe (IFF) systems to Mode 5, which will address NATO’s requirement for a new standard of IFF across all platforms.

The two companies are offering the Thales Bluegate products covering the majority of naval and land system Mode 5 Interrogator applications, as well as Raytheon UK’s IFF4810 Mode 5 upgrade solution for most air and naval Mode 5 transponder uses. Raytheon and Thales’ IFF Mode 5 subsystems use a common US-sourced KIV-77 Mode 4/5 cryptographic computer, which is more secure, deception
resistant and already in service with US armed forces.

The Raytheon Thales Team is uniquely positioned, being the IFF incumbents on more than 97 percent of the platforms involved in the Mode 5 upgrade. The low risk approach builds on prior authority and company investment in SIFF and Mode 5 while benefiting from the lessons learnt during the successful delivery of the SIFF capability.

Both Raytheon and Thales have already delivered Mode 5 IFF to a number of NATO forces. The solution is low risk and proven.

Also in 2014, Selex ES and Airbus Defence and Space were awarded a contract by the UK MoD to conduct a year-long platform integration study on Mode 5. The contract was awarded to precede the introduction of the Mode 5 IFF standard across the UK armed forces’ land, sea and air platforms.

A key element of the team’s approach was to minimize equipment types, using the Finmeccanica - Selex ES M428 Transponder and SIT 2010 cryptographic computer for all platforms. Notably, the SIT 2010 cryptographic computer is not subject to ITAR (International Traffic in Arms Regulations) or competing demands for the technology and can be repaired in the UK, allowing for full operational independence. Combined with Airbus Defence and Space’s MSSR 2000 I® Interrogator, in-service with the Royal Navy, the team was to deliver a fully European-sovereign, low-risk and UK-supportable equipment and integration solution.

Finmeccanica - Selex ES has already delivered Mode 5 IFF for the Royal Navy’s Queen Elizabeth Class aircraft carriers and Royal Air Force Eurofighter Typhoons. Airbus Defence and Space also already provides Mode 5 IFF systems to the UK Ministry of Defence where they are used in the land and naval domains including the most recent Mode 5 S upgrades under the Royal Navy MSMIC programme. The two companies have collaborated with the UK MoD already for a number of years to define the Mode 5 requirement via the STANAG 4193 working groups and are currently cooperating to provide IFF Mode 5 for German Typhoon fighter aircraft.

Like the Thales Raytheon partnership, focus has been on low risk, cost-effective and proven technology that will enable the UK to switch its entire force over to the new Mode 5 standard.

Bold Quest is an annual capabilities demonstration that involves coalition forces from 12 NATO countries. The two week, staff-led coalition demonstration involves air combat assessment, joint fires, manoeuvres and system concepts. Thales, Raytheon, Selex and Airbus Space and Defence have all taken part in the exercise which is enormously important so that new concepts such as Mode 5 can be demonstrated in a simulated environment. Partners can then solve challenges that the systems have thrown up and work to find the best solutions.

Coalition operations

Coalition operations do not involve a single nation and their communications systems can be very different. However, exercises such as Bold Quest allow nations to demonstrate how their systems can interoperate. This is often the biggest challenge — using different equipment to meet the same goal. However, trials of technology that will eventually be fielded are paramount so that those who have manufactured them and those who will be using them can open up a dialogue to address weaknesses and highlight strengths.

The UK, like many other NATO States, has realized the high importance of addressing the upgrades of the IFF system. The deadline for the phasing out of Mode 4 is expected to be around 2020 when all NATO countries will be expected to have carried out their Mode 5 upgrades. The period of extensive testing that companies have recently completed, will ensure that countries like the UK are fully prepared for the switch to Mode 5 and the enhanced capabilities it will bring to armed forces. Although preparations are well underway, a NATO country is yet to begin the transition.

The work could take 15 years to complete, or even longer. Some say completion could potentially take up until 2040. There is a long way to go, but the new capabilities of Mode 5 will make for a digital IFF system that will incorporate a raft of new capabilities and ultimately make the battle space a safer place for allies.

GMC
Lockheed Martin Canada delivers modern combat system to Royal Canadian Navy

Signalling an exciting stage of maturity for the Royal Canadian Navy’s Halifax Class Modernization (HCM) Project, Lockheed Martin Canada is announcing several important program milestones.

The HCM project achieved First Article Acceptance - formal recognition that Lockheed Martin Canada’s combat system design meets the Navy’s performance requirements. First Article Acceptance was preceded by an extensive series of integration tests at the company’s Maritime Advanced Training and Test Site in Dartmouth, Nova Scotia.

Individual system acceptance of the Lockheed Martin Canada combat system has also been achieved on seven of Canada’s 12 Halifax Class frigates. They are: HMCS Halifax, HMCS Calgary, HMCS Fredericton, HMCS Winnipeg, HMCS Montreal, HMCS Vancouver and, most recently, HMCS Charlottetown. The ships completed a rigorous sea trial program to validate the combat system is ready to support the Navy’s critical missions.

Vice-Admiral Mark Norman, Commander of the Royal Canadian Navy, commented on the achievements of the HCM project. “The overall management and success of the program has proven to be an excellent partnership model for future shipbuilding projects, and has been recognized internationally. The valuable information provided to the New Zealand Ministry of Defence on our modernization experience assisted them in their decision to upgrade the combat systems on their ANZAC class ships. This global export opportunity of the Canadian combat system is the result of close collaboration between the Royal Canadian Navy, Department of National Defence, and industry.”

The complex HCM project was managed through several stages. Requirements reconciliation set the tone for the entire project with the Lockheed Martin Canada team working collaboratively with the Navy to ensure requirements were well defined to support the competitive selection of key sub-systems. This was followed by the design and implementation phases. As vessels continue to come out of the modernization process, they go through various stages of readiness as the new systems are tested and the crews are trained. Modernized ships have already returned to the fleet and are now conducting Canada’s important missions.

“Our innovative combat management system, integration methodology, and Canadian supply chain form the largest component of the modernization project,” said Rosemary Chapdelaine, Vice President Lockheed Martin Canada Mission Systems and Training. “Our team is thrilled to deliver Canadian-built, world-class technology to the Royal Canadian Navy.”

Lockheed Martin Canada’s heritage extends over three decades, to the original Halifax class ship program in the 1980’s. The company’s modern combat system is a result of the 30-plus years’ experience and knowledge of Canadian and NATO naval operations.

Building on this foundation, the company’s combat system was also selected and repurposed for command and surveillance capability on Canada’s new Arctic/Offshore Patrol Ships. Today, the company continues to work in partnership with the Navy, Irving Shipbuilding, Seaspan, and several industry suppliers.

“We are proud of our rich history in Canada and the advanced combat system integration capability we have built here,” Ms. Chapdelaine said. “At the very core of this success is the open and transparent communication established early in the project. Our teams continue to foster cooperation and partnership with all stakeholders - a model of success for future projects in Canada and abroad.”

GMC

Photo courtesy Lockheed Martin Canada
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