

# Canada is upbeat

As Canada's foremost defence and security showcase opens its doors for the 20th time, Christyn Cianfarani, president and CEO of the Canadian Association of Defence and Security Industries (CADSI), is upbeat.

CANSEC offers the ideal platform to showcase the cutting-edge Canadian technology, products and services for land-based, naval and aerospace applications at the heart of CADSI's 'Made Across Canada' Campaign. And it's on the up!

"CANSEC is sold out for 2017, so it's tough to outdo our numbers each year. In fact, our focus is quality over quantity. We want our exhibitors to get the maximum number of empowered buyers visiting their booths.

"That said, we've been able to 'reboot' the show floor a little bit and this year we have over 30 first-time exhibitors, which makes us very happy. Almost all of them are small and medium-sized businesses, which might never get the opportunity to have VIPs get a look at their technologies.

"On Monday morning we were treated to our very first helicopter landing at the show – the Canadian Coast Guard's brand new B412 helicopter. Not only do we have cool technologies coming out of the sky like helicopters and drones, we've built on last year's unmanned theme and are showing technologies moving about under the sea. From underwater remotely piloted vehicles to new sonar systems, we've got it on the show floor.

"Another popular theme this year is shelter systems. Canada is a world leader. We manufacture everything from traditional shelters for humanitarian and peace



operations, to shelters that can withstand high-velocity winds in the Arctic, to this year's showcase: self-deployable and armour-protected shelters."

CANSEC has clear value, not only as a vehicle for introducing CADSI innovation, technologies and services in the global defence marketplace, but ultimately in its contribution to the Canadian economy, says Cianfarani.

"While companies do not share with us the monetary amount of the business leads they generate from CANSEC both from a domestic sales perspective and export perspective, our members value their approval of CANSEC as a business development support activity with a 93 per cent satisfaction rating. That certainly tells us something. Add to that the fact that 60 per cent of the Canadian defence industry's revenues come

from exports in a highly protected international market, and it tells us that CANSEC and its international foreign delegation programme is an absolutely integral part of our industry's ability to do business abroad.

"The defence industry is not only an economic contributor to Canada – with some 63,000 people working in the sector contributing high-wage (60 per cent higher than the average manufacturing wage in Canada), high-technology activities – it is also innovation-intense and, we believe, under-utilised as a strategic pillar to advance the country's technological interests. In Canada we have recently started a new conversation on how to break out of our 'innovation rut' and one of those ways is through strategic procurement."

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Canada looks to strengthen its cyber defence

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Team Cormorant forms again for CH-149 upgrade


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# New helos for the Coast Guard



## DAVID DONALD

**Flying into the show site for its CANSEC debut – and the first helicopter to ever fly into the event – is the latest equipment for the Canadian Coast Guard. Seven Bell 412EP1s have been acquired for the Coast Guard's Medium-Lift Helicopter requirement, the first two of which were accepted into service by the Honourable Dominic LeBlanc, Minister of Fisheries and Oceans and the Canadian Coast Guard, in a 7 December ceremony last year.**

Purchased as part of the CCG's Fleet Renewal Plan, the Bell 412s were ordered in December 2014 to replace five Bell 212s. Although owned by the Coast Guard, they are flown and serviced by Transport Canada aircrew and engineers. The

aircraft have joined a fleet that not only supports operations around Canada's coastlines, but also around the Great Lakes, St Lawrence seaway and other inland waters. They deliver a range of key services on behalf of the Coast Guard and support the government's Oceans Protection Plan. Activities include ensuring the safety of marine traffic, reconnaissance for ice-breaking operations, supporting the maintenance of navigation and marine communications equipment, scientific research, fisheries enforcement, and the transport of personnel and cargo between ship and shore. The fleet also supports Environment Canada and the Department of National Defence.

Launched in August 2012, the fleet renewal plan authorised the

acquisition of 24 new helicopters to replace the current fleet of 21. In May 2014, Bell Helicopter Textron Canada was contracted to provide 15 Bell 429s for the CCG's Light-Lift Helicopter requirement, replacing Bell 206s, and all were delivered by February 2016. Together with the Bell 412 buy, this accounts for 22 of the 24 authorised machines, and options for the remaining two are being studied.

Introduced in 2013, the 412EPI is the latest version of the proven Model 412 design. A key enhancement is the Bell BasiX-Pro avionics with fully integrated glass cockpit featuring four 10.4in high-resolution multifunction displays. Power comes from Pratt & Whitney Canada's PT6T-9 TwinPac engine with increased power, while the BLR Aerospace

**The CCG's new Bell 412EP1s are outfitted with weather radar, flotation equipment and cable-cutters**

FastFin kit that improves performance and safety is fitted as standard in the factory.

Training for the fleet is to be undertaken from next year in a CAE 3000 Series helicopter simulator being installed at Transport Canada's training centre in Ottawa. The single simulator "mothership", with CAE Medallion 6000 visuals, has "roll-on, roll-off" cockpits for the Bell 412EPI and 429. When the full-motion simulator has one type of cockpit installed, the other cockpit can be connected to a docking station to act as a fixed-base flight training device.

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...continued from p1

“Defence acquisitions constitute about one third of total federal procurement spending, or about \$6 billion per year. Given that our industry is pan-Canadian in its reach, has a solid foundation based on several key industrial capabilities, the Canadian Armed Forces are in the midst of a historically large recapitalisation, and the government has several policy tools to drive innovation in the defence sector, it is the obvious place to test the concept of strategic procurement and increase our contribution to the Canadian economy.”

With the Canadian Department of National Defence now planning to bolster its cyber-warfare capabilities, cyber is a prospective growth area in the CANSEC focus.

“We’re looking to increase participation in CANSEC for leading-edge cyber defence firms. It’s one of the reasons why we invited US Army General Keith Alexander (Retired) to speak to us this year about his experiences as Director of the National Security Agency/Chief of the Central Security Service (CSS) and first Commander to lead the US Cyber Command. We’re also working on an advocacy agenda that includes major Government of Canada stakeholders and identifies resident Canadian capability operating in the cyber defence space.”

Challenges in the future? It’s all about underpinning the CADSI relationship, says Cianfarani.

“Our focus is always on keeping our members engaged and happy, whether that be through our advocacy platform, the quality of our events or our value-added services. The most important challenge that we face is for our members to believe that placing some of their hard-earned revenue in CADSI gives them a good return on investment. If we can do this, we’ve got the recipe right.”



Cianfarani: focus on quality

## RICHARD SCOTT

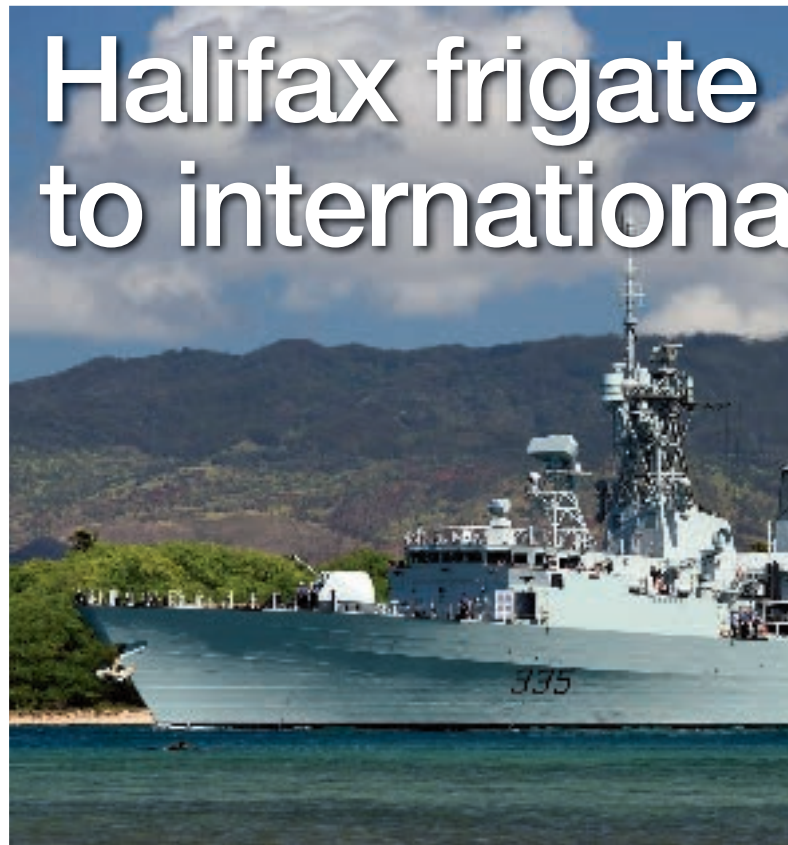
**Capitalising on more than three decades’ experience as Combat System Integrator (CSI) for the Royal Canadian Navy (RCN) and the successful delivery of the 12-ship Halifax Class Modernization (HCM)/Frigate Equipment Life Extension Project (FELEX) programme, Lockheed Martin Canada (Booth 1311) has now secured two major international contracts.**

The most recent success, formally announced this month, will see the company take the lead role in the upgrade of the Armada de Chile’s three Type 23 frigates. This follows on from New Zealand’s 2014 decision to contract Lockheed Martin Canada for the modernisation of two ANZAC class frigates under the Frigate Systems Upgrade (FSU) programme.

The RCN’s Halifax class frigates were originally commissioned between 1992 and 1996. Under the HCM/FELEX project, the 12 ships have received both a combat systems upgrade (including a new command and control system, new sensors and electronic warfare systems and upgraded communications) and a planned mid-life overhaul to ensure that they remain effective for the remainder of their service life.

Lockheed Martin Canada was in November 2008 brought under contract as prime contractor, CSI and in-service support agent for the HCM/FELEX project. Under the C\$2 billion CSI contract, the company has taken responsibility for the development, integration and test of a new combat management system, together with the procurement and integration of new radars, electronic support measures (ESM), Identification Friend or Foe (IFF) equipment, and a multilink data processor.

At the core of the upgraded combat system is the new open architecture CMS 330 combat management system, which builds on the legacy CCS 330 system, knowledge of the US Navy’s Aegis system, and more than 30 years of experience as the RCN’s incumbent CSI. The open architecture approach embodied in CMS 330 also allowed the company to insert technology matured through Defence Research and Development Canada’s science and technology programme.



Alongside the introduction of CMS 330, the HCM/FELEX programme has seen the Halifax class above-water sensor suite subject to a significant upgrade. The legacy AN/SPS-49A(V)5 long-range 2D radar has been replaced by the Thales Nederland SMART-S Mk 2 3D E/F-band multibeam surveillance radar for volume search, while the existing Sea Giraffe 150HC G-band target indication radar has been modified by Saab to improve performance in high-clutter environments.

A new Mode 5/S IFF suite, at the core of which is the AN/UPX-505 All-Modes IFF system from Telephonics, has been delivered to replace the earlier Mk XII system. The new IFF system supports all modes of interrogation and each mode is fully integrated with the remainder of the combat system.

The earlier STIR 1.8 fire control radars – used for tracking and target illumination for the semi-active radar homing RIM-7P and later RIM-162 Evolved SeaSparrow Missiles – have also been replaced. In this case, Saab was contracted to provide its Ceros 200 fire control radar, with systems fitted fore and aft.

Another significant upgrade concerns passive electronic surveillance. The obsolete

AN/SLQ-501 CANEWS system has been removed, with Elisra’s NS9003A-V2HC digital ESM system introduced in its place.

To improve tactical data exchange, a new IBM Canada multilink processing system has been introduced to the combat system. This provides interoperability using NATO Link 11 and Link 16, and is enabled for Link 22.

Lockheed Martin Canada has also taken responsibility for integrating other equipment (acquired separately by the Canadian government and supplied to the programme as government-furnished materiel) into the upgraded combat system. These include the upgraded Advanced Harpoon Weapon Control System (enabling mission planning and launch of the Harpoon Block II missile), and Rheinmetall’s MASS\_DUERAS soft-kill decoy system.

HMCS *Toronto* – the 12th and final ship to be cycled through the HCM/FELEX programme – was redelivered to the Department of National Defence Dockyard in Halifax, Nova Scotia, in November 2016. Domestic attention has now turned to the new Arctic/Offshore Patrol Ship (AOPS) project, part of Canada’s National Shipbuilding



# Upgrade leads success



HMCS Calgary

Procurement Strategy, for which Lockheed Martin Canada is a Tier 1 subcontractor to prime contractor Irving Shipbuilding; in this role, the company is taking responsibility for key integration of data and information sources to increase the ships' situational awareness, and provide command, control and decision support. A repurposed variant of CMS 330 provides the core solution for AOPS.

The success of the HCM programme, and the proven performance of CMS 330 in RCN service, has also endowed Lockheed Martin Canada with a credible, low-risk solution with which to pursue international business. Efforts in this area reaped a first reward in April 2014 when the company was awarded a NZ\$207 million contract by the New Zealand Ministry of Defence to modernise the Royal New Zealand Navy's (RNZN's) ANZAC frigates HMNZS *Te Kaha* and HMNZS *Te Mana* under the FSU programme.

The FSU covers the upgrade of the surveillance, combat and self-defence capabilities of the ANZAC frigates to match current and future threats, while addressing obsolescence in some of the current systems. The full

scope includes the replacement of CMS hardware and software, new radars, electronic detection and other above-water sensors, improved decoys, a torpedo defence system, an upgrade to the hull-mounted sonar, and the replacement of the RIM-7P SeaSparrow point-defence missile system with a more capable Local Area Air Defence (LAAD) system.

The LAAD requirement is being met through the procurement of the MBDA Sea Ceptor system and its associated Common Anti-air Modular Missile (CAMM).

In its role as prime system integrator, Lockheed Martin Canada is responsible for the design, development and delivery of a nine-console CMS 330 for the two frigates, together with the supply and integration of various sensors, the missile system, and a combat system trainer for Devonport Naval Base in Auckland. The combat system trainer was delivered ahead of schedule to the Maritime Warfare Training Centre at the RNZN's Devonport base in February 2017.

Several HCM systems are common to the FSU programme (there will be about 70 per cent commonality between the Canadian and New Zealand ships as far as the effort required to deliver the upgrade is concerned). These include the Thales SMART-S Mk 2 radar, the Telephonics IFF suite, the Elisra NS9003A-V2NZ ESM, an IBM-supplied datalink processing system, and the Rheinmetall MASS\_DUERAS soft-kill system.

A number of new-to-type sensor systems have additionally been selected for the FSU. These comprise Sagem's Vampir NG infrared search and track system, Saab's Naval Laser Warning System, and the Kelvin Hughes SharpEye navigation radar. Airborne Systems will provide its FDS-3 passive

radar decoy system to meet the ASMD soft-kill requirement, while Ultra Electronics' Sonar Systems business is supplying its Sea Sentor surface ship torpedo defence system.

The majority of the FSU work scope is being completed in Canada at Lockheed Martin facilities in Dartmouth, Kanata and Montreal. The FSU embodiment itself will take place at Seaspan's Victoria Shipyards.

Lockheed Martin Canada's most recent success for CMS 330 is in South America, with the company brought under contract in February this year as CSI for the upgrade of Chile's three ex-UK Royal Navy (RN) Type 23 frigates *Almirante Cochrane* (ex-HMS *Norfolk*), *Almirante Condell* (ex-HMS *Marlborough*) and *Almirante Lynch* (ex-HMS *Grafton*). The Armada de Chile selection now places Lockheed Martin Canada's CMS 330 on four classes of ships across three different navies.

Alongside CMS 330, Lockheed Martin Canada has selected the Hensoldt TRS-4D G-band multifunction surveillance and target acquisition radar (rotating variant) and the MBDA Sea Ceptor anti-air missile system for the Chilean Type 23 upgrade programme. The company is currently working with the Chilean Navy to finalise the programme schedule: the upgrade embodiments will be undertaken in conjunction with Chilean shipyard ASMAR.



Combat trainer system delivered to the RNZN in February



# FWSAR heads training systems

DAVID DONALD

Before the end of this fiscal year, CAE (Booth 1611) expects to have broken ground on its latest training centre, which will be established at CFB Comox in British Columbia to support the Airbus C295W fleet that is being acquired for the Fixed-Wing Search and Rescue (FWSAR) role.

This step is the latest in a progression as the world-renowned training provider continues its transition from being a manufacturer of simulators to a full training service integrator.

CAE is the worldwide training partner to Airbus on the C295 and has provided simulators to Brazil, the Royal Air Force of Oman and the manufacturer's own International Training Centre at Seville in Spain. It is currently on contract to deliver a second simulator to Airbus, and will deliver another to Poland later this year.

Under the first phase of the FWSAR contract, CAE will design, build and implement a full-service training centre at Comox to meet

both ground- and aircrew training requirements. Hardware will include: one full flight simulator; one cockpit procedures trainer; one sensor station simulator for

rear-crew training; one operational mission simulator that supports networking of flight deck and rear-crew simulators for full-crew mission training; eight mission procedure trainers; one aircraft maintenance trainer; and one cockpit system part-task trainer. There will also be 10 classrooms outfitted with CAE's Simfinity virtual maintenance trainer stations.

This first phase is due for completion by 2019, after which there will be a three-year in-service support transition period to bed in the training programme, followed by a 20-year in-service support phase. CAE will not only be responsible for the day-to-day maintenance, support and upgrade of the hardware and software, but will also provide academic and simulator instructors to deliver aircrew and maintenance training.

What is being implemented at Comox for FWSAR is similar to the training centres CAE has already established at CFB Trenton for the CC-130J and CFB Petawawa for the CH-147 helicopter fleet.

The centre highlights the vision of the Royal Canadian Air Force to move ever closer to a fully networked training system in which simulators are linked to allow force-wide training, despite the considerable distances between the centres. At the heart of the software is a common terrain database that is under development, which can be shared and updated across all Canadian simulators. This allows all elements of the network to use common data and provides all participants in missions with a "fair fight" scenario. It also facilitates the planning of collective training missions.

CAE is also positioned to increase its activities in the naval domain. It is already a partner with Lockheed Martin to deliver in-service support to the Royal Canadian Navy's Halifax class update, and aims to be involved in the next-generation Canadian Surface Combatant programme.

CAE has recently been contracted, along with Babcock and local companies, to design and develop a comprehensive naval training centre at Taweelah in the United Arab Emirates. This centre includes a full range of maritime simulation suites, including those for maritime patrol aircraft rear-crew, combat information centres, ship bridges and machinery control rooms, supported by an array of reconfigurable training consoles for various mission tasks.

Last year, CAE also installed a naval warfare training system at Karlskrona for the Swedish navy.



This pic: Door gunnery training in the CH-147 training centre at Petawawa. Top: An impression of the CAE FWSAR training centre being built at Comox. Right: The Swedish navy's naval warfare training system at Karlskrona

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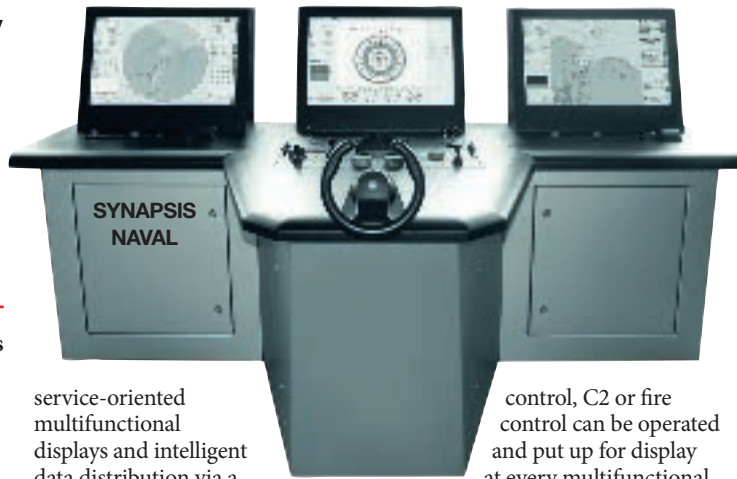
# Flexibility as never before

ROBIN HUGHES

Raytheon Anschutz is showing its latest naval integrated navigation and bridge system (INBS) solution at Raytheon Canada's Booth 1221.

SYNOPSIS NAVAL leverages the existing SYNOPSIS Integrated Navigation System, and integrates various military system capabilities including: radar video merging and other tactical radar features; integrated situational awareness; ship self-defence capabilities; military surveillance radars; and cyber security solutions.

SYNOPSIS (including the SYNTACS command and control (C2) system), as tailored for naval vessels, is based on common/shared (or even customer-loaned) hardware platforms,



service-oriented multifunctional displays and intelligent data distribution via a lean and transparent local area network (LAN). This means the function of a dedicated display is defined later using the software, so that the entire INBS becomes a software-defined system – with each workplace being able to carry out any desired system function or be available to do so. The advantages of this system architecture are cost savings and a hitherto unknown flexibility.

Individual applications such as radar, electronic chart display and information system (ECDIS), track

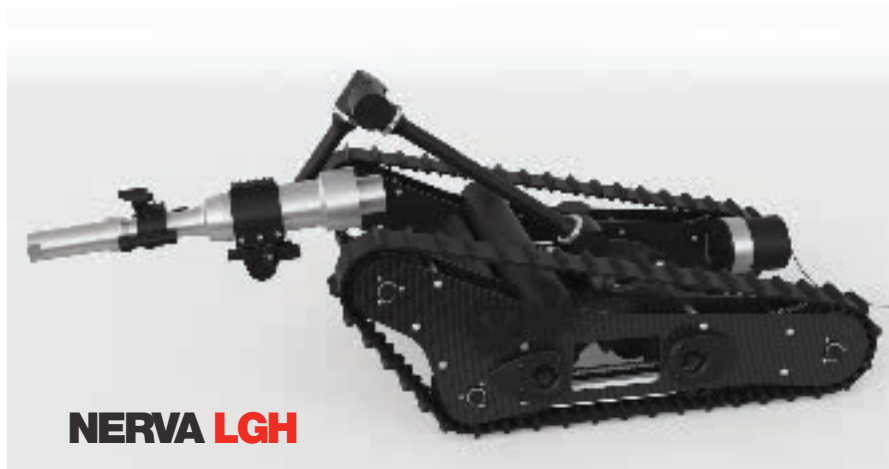
control, C2 or fire control can be operated and put up for display at every multifunctional workstation. The concept

reduces hardware cost and gives the customer a never-before-possible flexibility in concept, design, ship construction, and adaptation over lifetime. The entire system is scalable – from large, advanced systems to compact, highly effective system arrangements, all based on the same hardware setup and software architecture.

SYNOPSIS NAVAL is a software-defined system built on commercial-off-the-shelf

(COTS) technology and open system architecture to simplify maintenance and logistics, and to support upgrades and future capability needs. It features advanced sensor degradation and data distribution management, which provides the base for scalability of system functions and integration with other onboard systems such as automation or combat management. This includes integration of government-furnished equipment and integration on customer-provided hardware or network infrastructure.

Andreas Weidner, director of business development for Raytheon Anschutz, said: "Our software architecture delivers increased system interoperability and advanced operational capabilities while mitigating integration risk for customers. We have a legacy of bridge system integration experience, across bridge navigation systems and third-party equipment such as specialised radars or WECDIS [Warship Electronic Chart Display and Information System], which is based on decades of research, development and execution."



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## GÜNTER ENDRES

The Canadian Army has selected Rockwell Collins' Firestorm joint-fires solution for its Digitally-Assisted Close Air Support (DACAS) system to link airborne platforms and ground-based joint terminal attack controllers (JTACs) via an Android smartphone.

Under the contract, Rockwell Collins will produce and service 100 Android-based joint-fires systems with the potential for follow-on options. The company will qualify the initial systems by this summer, for the Army's use on the multinational BOLD QUEST exercise in the autumn. The agreement includes in-country service and support in Canada for up to 10 years. System development will be based in Richardson, Texas, while Rockwell Collins Canada will directly provide support to the Canadian Army.

Based upon the most widely used joint-fires system in the world, the wearable Android-based joint-fires delivers a lightweight and user-friendly solution, while maintaining full



digital interoperability with a wide range of coalition aircraft and artillery systems.

"Migrating away from hardware solutions to commercial off-the-shelf technology drives down cost and provides user-friendly and updatable platforms," said Lee Obst, managing director, Rockwell Collins for Canada. "The Android joint-fires solution is a great example of leveraging cutting-edge technology for military purposes."

Rockwell Collins (Booth 1103) is stepping up its capabilities to provide systems, integration and complete solutions for Canadian customers. Its offers range from communications, navigation, surveillance, displays, flight management systems, datalinks and autopilots products, to fully integrated avionics systems, which can be found on almost every platform operated by the Canadian National Defence today.

In addition, the company is a leading provider of highly integrated, information-rich cockpit systems for new Bombardier Aerospace commercial and military special purpose aircraft.

Rockwell Collins Canada is leading the development and deployment of the company's new wideband HF communication systems for use in Canada and for global export from its Ottawa facility. It also specialises in the design and development of wireless, ad-hoc networking technologies, including battlefield modelling and simulation of tactical networks. The SubNet Relay technology developed here is in use with customers worldwide, deployed with some of the world's major navies.

The facility also provides support for Multi-functional Information Distribution System Link 16 terminals installed on Canadian Forces CF-18 fighters, as well as ARC-210 radios and field service engineering for CH-147, CC-130s, and other commercial derivatives owned and operated by the Government of Canada.



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# Aiming for Canada's CSC

ROBIN HUGHES

**With the Canadian Department of National Defence still in consultation with industry bidders for the Royal Canadian Navy's (RCN's) prospective Canadian Surface Combatant (CSC) requirement, European missile house MBDA is positioning its Aster 30 and Sea Ceptor missile systems to meet the air defence requirements for all CSC operational roles. Both systems are on display at the MBDA (Booth 401).**

"The ships that will eventually replace the Halifax and Iroquois ships with a single class will form the backbone of the future RCN fleet and MBDA has a range of air defence and anti-ship capabilities that it feels is highly relevant to Canada's requirements," an MBDA spokesperson told the *Show Daily*. "Given that the CSC platform has yet to be selected, and given that the future fleet might see ships within the class required to carry out differing roles, MBDA is putting forward a range of options from its extensive maritime product catalogue.

"For long-range air defence, Aster 30 is in service with several navies and has proven its capabilities against even the severest of threats such as sea-skimming, supersonic anti-ship missiles. It has also shown its ability to deal with ballistic missiles. Very important when looking towards the future, Aster offers a significant growth path and consideration is already being given to a next

generation Aster B1 NT with even greater ATBM capability."

Sea Ceptor, deploying the Common Anti-air Modular Missile (CAAM) missile, is currently being delivered to equip the UK Royal Navy's Type 23s before going on to provide the air defence for its future fleet of Type 26s in the next decade. "Should some of the CSC ships

be required to have a short, local area defence role to fill, then Sea Ceptor, already chosen by several export customers, could be a very suitable option. At the start of its product life cycle, CAMM has a lot of scope for evolutionary enhancements as the future anti-ship threat develops. This highly compact, soft launch CAMM weapon offers optimum flexibility

in a ship fit due to its very compact launch system requirements," said the spokesperson.

Construction of the vessels is expected to start in the early 2020s. If the eventual fleet configuration includes a requirement for a long-range anti-ship missile or long-range naval launched weapon, MBDA is equally well positioned.

"For the anti-ship role, the eponymous Exocet is well known throughout the world. Exocet, in its latest MM40 B3 variant with a range exceeding 200km [125 miles], is designed to thwart even the most advanced of naval air defences. It will also give the CSC the ability to strike fixed land targets throughout the littoral.

"Should the requirement also be considered necessary to give the CSC fleet a deep land strike capability, MBDA's range also includes the Naval Cruise Missile (NCM). NCM is currently being prepared for the French Navy's FREMM frigates and Barracuda submarines. With its long stand-off range, NCM provides a major deterrent force well outside territorial waters and the dangers of an enemy's anti-ship retaliation or interdiction," the spokesperson added.

Aster 30



Sea Ceptor delivered through the CAMM missile



**SMALL ARMS TRAINING.**

 A photograph showing several soldiers in military uniforms engaged in training. They are looking intently at a screen or equipment, possibly simulating a combat scenario.
 

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# Sharper Spike



**Main pic: Spike LR II**  
**Inset: Front view shows the new uncooled infrared sensor**



datalink with a radio frequency (RF) datalink. The company has developed a lightweight miniature RF communications link assembly for the missile, and has embedded a lightweight two-way RF datalink antenna in its new ultra light launcher for helicopters. The missile can still be fired using a fibre-optic data link, but in this configuration the image is lost after 5.5km; the RF datalink configuration also obviates the possibility of the fibre-optic datalink being cut by the helicopter rotors.

Rafael has also designed a new electro-optic (EO) seeker package for the missile, which includes a new uncooled IR sensor, a new high-definition light emitting diode (LED) colour day sensor (earlier Spike EO packages work with a monochrome image), and a smart tracker with what Rafael describes as “artificial intelligence” (AI) features.

Designed to reduce the tracking burden on the gunner, once the target is defined, the new smart tracker immediately locks on, and continues to independently track the target even if it disappears behind buildings or other common battlefield obscurations, without requiring the gunner to update the tracker manually, as with the fourth-generation datalink-equipped Spike LR.

A Rafael spokesperson said Spike LR II is still in the development and testing stage, with risk reduction on the new warheads and uncooled IR seeker currently ongoing.

The company is planning to finalise full-scale development of the new missile by the fourth quarter of 2018.

**ROBIN HUGHES**

**Rafael Advanced Defence Systems is introducing a new, fully network-enabled capability to its family of Spike multipurpose missile systems.**

The new Spike LR II features reduced weight, a significant range increment, enhanced lethality, advanced target recognition and tracking, and a new third-party target allocation (network-enabled) enhancement with an embedded inertial measurement unit (IMU) assembly.

Designed to be fired from ground launchers, vehicles, ships and helicopters, Spike LR II is an evolution of the legacy fourth-generation Spike LR multipurpose missile (now designated Spike LR I), but retains full commonality with the legacy Spike family, and can therefore be fired from any Spike launcher, with only a minor software update required to accommodate the missile.

At 12.7kg (28lb), the new missile is approximately 1kg (2.2lb) lighter than the Spike LR I – this was achieved primarily by switching from a cooled to an uncooled IR sensor, which removed the requirement for an internal gas cylinder and cryogenic pipes, and “engineering the missile to a lighter weight”, according to Rafael.

Spike LR II is intended to engage new, modern low-signature and time-sensitive targets, “as well as various types of advanced armour and protection systems”, according to Rafael – this is understood to include a capability against heavy/light armour equipped with modern active protection systems.

Uniquely, the company developed two new warhead configurations for the missile – a tandem high explosive anti-tank (HEAT) warhead, designed to engage main battle tanks or heavy armour and which, according to Rafael, enhances the armour penetration capability of the

missile by more than 30 per cent over the legacy Spike LR I; and a “smart” multipurpose blast warhead, with selectable breech or impact fuze options, designed to engage structures, soft-skinned vehicles, and personnel in open terrain. Essentially, the operator selects the mix of missiles according to the mission requirement.

The new Spike LR II has a stated range of 5.5km (3.4 miles) when fired from a ground launcher (an increase of approximately 35 per cent on the 4km range of the legacy Spike LR I) – achieved by “enhancements” to the current Spike LR I rocket motor, and from engaging the targets at a high angle of attack. The ground-launched Spike LR II uses a slightly longer (5.5km) fibre-optic datalink to that used in the Spike LR I.

In a helicopter-launched role the Spike LR II achieves a far longer range – out to 10km (6.2 miles) – replacing the fibre-optic

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A large white naval ship, likely a destroyer or frigate, is shown from a high-angle perspective, sailing on the ocean. The ship is moving from left to right, leaving a white wake behind it. The sky is a mix of blue and orange, suggesting a sunset or sunrise. The ship's superstructure is complex, with various antennas and radar equipment visible.

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# IN BRIEF

## Maintenance contracts

Kelowna's KF Aerospace (Booth 1824) has been awarded two military maintenance contracts valued at more than \$30 million. The first is a \$21.8million contract to help maintain the Royal Canadian Air Force's CC-115 Buffalo search and rescue aircraft for three years. The second, worth \$9.6 million, will help maintain the RCAF's CC-138 Twin Otter transport aircraft for four years. Both contracts include options for extensions. "We're very pleased to now be maintaining these airplanes right through to what we hope is the end of the serviceable life of the aircraft," said KF Aerospace president Tracy Medve. Canada has six Buffalos based at Comox, British Columbia, and the four Twin Otters are stationed at Yellowknife, North West Territories.

## ROBIN HUGHES

**In March 2017, documents released by the Department of National Defence (DND) announced plans to "strengthen" Canada's cyber-warfare arsenal. "Cyber ... (is) increasingly prominent among the security and defence challenges facing Canada and its allies," the documents noted, adding: "...[In 2017] we will advance our research in the future of cyber warfare to improve and strengthen both our defensive and offensive capabilities."**

The documents serve to reinforce the requirements outlined in the December 2016 Defensive Cyber Operations Decision Project, under which the DND will evaluate capabilities that will allow its forces to effectively operate in the current cyber domain, and to support its international allies.

As part of this project – which will ultimately culminate in a plan that will be submitted to the federal government – the DND has asked industry to propose

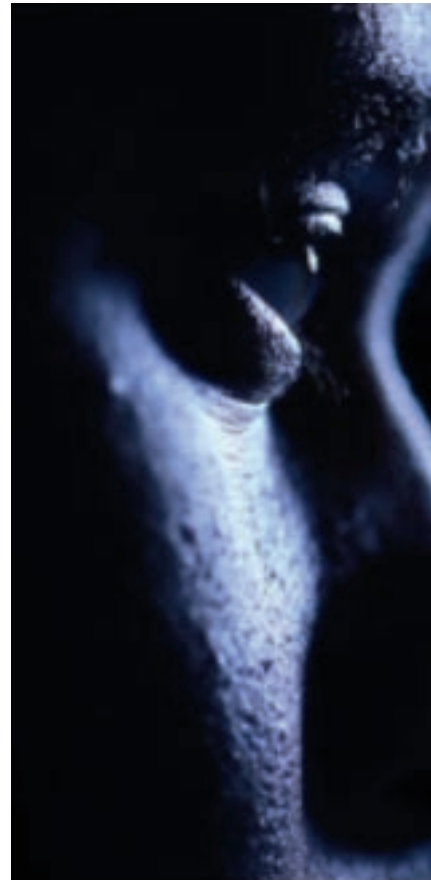
technologies that can hunt for Advanced Persistent Threat hacks.

One of the major challenges associated with cyber threats is their rapidly evolving nature. Cyber exploitation tools are easily accessible and are susceptible to abuse by relatively low-skilled hackers.

The motivations and skills of cyber-attack perpetrators also transform over time. Today, these can be broadly categorised into six groups: cyber criminals with access to advanced tools; state-sponsored actors; terrorists; hacktivists; malicious employees; and script kiddies. In a worst-case scenario, this landscape can shorten the length of time it takes an attacker to pose a national security threat.

Adopting an intelligence-driven defence approach is crucial to safeguarding citizens and national assets in an environment where cyber attacks quickly evolve and 'mutate', leaving organisations that utilise a static defence system vulnerable to exploitation.

A proactive cyber defence framework of operations also includes a mix of appropriate



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# Bolstering Canada's cyber warfare capability

products and skilled security personnel, said Dan Seamans, international business development lead for Lockheed Martin Cyber Solutions.

“Working closely with our partners, we are seeking to evolve governments and organisations from ad hoc users of intelligence to producers of proprietary intelligence that can be actioned to protect networks.

“A fundamental line of first defence in cyber security involves monitoring systems to detect potential threats. The cyber attacks framework we’ve developed enables security personnel to identify and anticipate tactics associated with cyber threats and covers seven steps: reconnaissance; weaponisation; delivery; exploitation; installation; command and control; and actions on objectives.

“The framework aims to monitor and adapt to the attacker’s actions, ensuring that they are ‘blocked’ at a stage of the chain before completing the attack.”

Cyber hardening is another critical area for cyber security that continues to gain significant

momentum across governments and organisations ultimately to prevent adversaries from taking over and potentially deteriorating the performance of these systems. Cyber hardening entails securing various threats and challenges across multiple domains to span all facets of cyber security: physical; human; supply chain; engineering; and operations. As government platforms become more sophisticated, cyber hardening will need to extend to all systems within the platforms as well as support systems and mission systems.

Seamans concluded: “In the future, more governments will continue to see an increase in systems that are more autonomous, integrating human-machine collaboration and energy efficiency-smart grids. As the number of these interconnected platforms grow, it will be critically important for governments to adopt a combination of our approach to the framework and cyber hardening as effective cyber security solutions in addition to training the next generation of cyber protectors.”

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**Main picture: The Carl-Gustaf M4 demonstrates its long-range airburst capability at the Bofors Test Site. Inset: Shorter and lighter than its predecessor, the M4 is well-suited to urban warfare**

firing programmable rounds. The US DARPA agency has also contracted Saab Dynamics to study the possibility of using precision-guided rounds under the MOAR (massive overmatch assault round) programme.

Canada's forces have been one of many to appreciate the capabilities of the Carl-Gustaf, and a range of ammunition is supplied by General Dynamics Ordnance and Tactical Systems – Canada. Available rounds from GDOTS include FFV551 and FFV751 HEAT, FFV552 HEAT target practice, FFV441D anti-personnel, FFV401 area deterrent, FFV502 anti-structure, FFV469C smoke and FFV545C illuminating rounds. Sub-calibre 7.62mm rounds are also available for initial training. All previous types of round can be fired from the M4 version.

Slovakia was the first nation to buy the M4 and it is under evaluation by the US Army as the M3E1 MAAWS (multi-role anti-armour, anti-personnel weapons system), with an aim of fielding the weapon next year. By the beginning of this year, four customers had signed up for the new version.

## 'Charlie-G' loses weight and gets smarter

DAVID DONALD

Although it has been around since 1948, the Saab Dynamics (Bofors) Carl-Gustaf 84mm recoilless-rifle weapon system remains one of the most versatile weapons on the battlefield.

It has proved of considerable significance to the special forces community due to the variety of effects that can be achieved by carrying different types of round, and by being able to be used over a wide spectrum of engagement ranges. Its suitability for urban warfare, its airburst capability against enemy forces in defilade at

long ranges, and its ability to target bunkers have led to something of a renaissance for the 'Charlie-G'.

Having introduced the M3 version in the late 1980s, Saab (Booth 1521) has recently introduced a new model, with weight-saving as one of its primary advantages. The Carl-Gustaf M4 weighs less than 7kg (15lb), compared with 10kg (22lb) for the preceding model, thanks to its titanium barrel and composites tube. It is somewhat shorter, too, at less than 1m, making it more agile and more suited to urban warfare, and it is provided with more adjustment

in the grips and shoulder rest. There is a new transport safety feature, which allows it to be carried with a round loaded, significantly reducing reaction times when countering pop-up threats. Another new feature is an automatic round-counter function to aid in the planning of logistics and maintenance schedules and to free the soldier from the burden of having to record every firing.

The Carl-Gustaf M4 is compatible with intelligent sighting systems, which can detect which type of round is being fired, adjusting themselves accordingly. It is prepared for

## Beyond line of sight

ROBIN HUGHES

Lockheed Martin (Booth 1311), in partnership with Canadian UAVs, has completed the first beyond visual line of sight (BVLOS) pipeline and well assets inspection using the Lockheed Martin Procerus Technologies' Indago 2 unmanned aerial system (UAS).

The inspection was completed at the Foremost Centre for Unmanned Systems, Alberta, and is the result of more than eight years of planning and co-ordination between the Village of Foremost, Transport Canada and NAV Canada, a private, non-share capital corporation that owns and operates Canada's civil air navigation service.

Indago 2 is a multiple payload-capable quadcopter, with a ready-to-fly weight, including 'hot-

switchable' payload, of 2.27kg (5lb). Requiring no assembly prior to flight, Indago 2 has an endurance of approximately 45 minutes, and can achieve ranges of up to 5km (3.1 miles) when operated using its handheld controller; the range can be extended beyond 10km with directional communications devices.

Indago 2 is one of few unmanned systems deemed Transport Canada compliant, meaning that Indago operators are approved for routine access to Canadian airspace.

"Our systems routinely fly beyond line of sight for our military customers, which has allowed us to gain compliance status with Transport Canada for use in commercial airspace," said John Molberg, business development lead for Lockheed



Martin CDL Systems. "This flight achievement is a bellwether for Canadian UAVs, Lockheed Martin and Foremost Test Range, and showcases the leadership provided by Unmanned Systems Canada and Transport Canada for the safe use of unmanned systems in Canadian airspace."

In tandem with the UAS platform, the Indago system includes a lightweight, weather-resistant, wireless hand controller, which provides an easy-to-use interface for untethered UAS operations. Weighing 1.6kg, and with a run time of four hours, the hand controller can be used for small UAS operations, whether fixed-wing or vertical take-off and landing (VTOL), to provide

onboard video recording and high-resolution still images.

During the BVLOS inspection at the CCUVS, the Indago 2 was equipped with a 30x optical zoom and enhanced digital zoom payload. Featuring a three-axis mechanical and inner stage electronic image stabilisation with global shutter, the optical payload can achieve a 1.5° field-of-view full zoom, with a facial recognition capability from stand-off ranges of in excess of 230m.

Indago's high-quality real-time airborne imaging capabilities include Lockheed Martin's new Hydra Fusion Tools – this provides situational awareness during operations, and is the only system to provide real-time three-dimensional reconstruction during UAS flight. The latest version of Hydra Fusion Tools enables a user to "fuse" various data feeds and monitor them together on a single homogenous display.



# Making the sea safer

## IN BRIEF

Having signed a memorandum of understanding with Magellan Aerospace for collaboration on the SeaSpider Anti-Torpedo Torpedo (ATT) at CANSEC 2016, Atlas Elektronik (Booth 505) will use this year's show to focus on this torpedo, which will employ Canadian rocket and propellant technology.

SeaSpider is the world's first ATT, designed to provide an effective and affordable solution to counter threats to ships, submarines and sailors against torpedo attack, in both deep and shallow water, even in the worst 'sonar weather'. SeaSpider actively targets the incoming threat torpedo independent of its type of homing functionality, with the aim of destroying or disabling it with explosive and/or kinetic energy,

before it completes its mission.

Torpedo propulsion has seen great advances in recent years both in range and speed. The modern torpedoes are impervious to 'soft-kill' torpedo defence technology and represent the most dangerous threat to shipping today. SeaSpider's 'hard-kill' ATT is said to provide defence against any and all threat torpedo types in all relevant environments.



SeaSpider is specifically designed to be affordable for navies in procurement and operation. To achieve a low unit cost, uniquely for guided underwater weapons, a solid propellant rocket motor was chosen as propulsion element, which provides affordable and compact high-energy performance. Other design choices

aim to minimise production cost. The operational concept allows for a 'torpedo alarm' configuration with a very low false alarm rate, which further reduces expenditure. The maintenance-free canistered round reduces maintenance effort and simplifies handling.

Bremen, Germany-based Atlas Elektronik, together with its subsidiaries, is a world leader in naval and marine electronics and systems. The company offers a wide range of products including submarine systems, high-performance marine electronics for surface combatants, mine countermeasures, maritime security, surface and underwater unmanned vehicles, naval weapons, maritime communication technology, anti-submarine warfare, sonar technology, and maintenance and logistics services.

### Arctic alert

The disappearance of ice and increased human activities has focused unprecedented attention on the Arctic. The Arctic is the focus of Defence Research and Development Canada's (DRDC) All Domain Situational Awareness Program, but if contemplating penetrating this new market, there are others able to help. Arctic Security Consultants (www.arcticsecurity.ca) is led by Colonel (Retired) Pierre Leblanc, who has 45 years of experience in the region, during which he commanded the Joint Task Force North for five years and later managed the North Warning System for two years. Among his team are experts on search and rescue and security in the Arctic, adding to a network of political, business and Inuit leaders. Col Leblanc can be met at the B2B facilities.

## NEWS RELEASE

QinetiQ enhances position in global test and evaluation through acquisition of Meggitt Target Systems

# QinetiQ

**21 December 2016** – QinetiQ announces this morning that it has acquired Meggitt Defence Systems Limited and Meggitt Holdings Canada Inc. (together "Meggitt Target Systems") from Meggitt for £57.5 million on a cash-free, debt-free basis.

Meggitt Target Systems is a leading international provider of unmanned aerial, naval and land-based target systems and services for test and evaluation ("T&E") and operational training and rehearsal. The business is expected to generate approximately £28 million of revenue and approximately £5.5m of operating profit in the year to 31 December 2016.

Meggitt Target Systems provides target systems to approximately 40 countries from its operations in the UK and Canada, and performs on-site target services in 15 of those countries. It will form part of QinetiQ's new International business unit and will be reported within QinetiQ's Global Products division.

### Strategic rationale

- Meggitt Target Systems holds a leading position in the growing global target systems and services market
  - Meets increasing global demand for high-fidelity threat representation to validate defence and security capabilities against current and future threats
  - Generates 90% of its revenue from outside the UK
  - Opens new routes to market to accelerate QinetiQ's international growth
  - Establishes a design and manufacture capability in Canada
  - Adds multiple customer relationships in Europe, Asia and North America
- Strengthens QinetiQ's ability to deliver world-class test and evaluation
  - Adds cost effective unmanned aerial, naval and land-based target systems and services
  - Accelerates the modernisation of T&E services through the integration of threat representation with QinetiQ's existing capabilities



### Financial highlights

- Acquisition of a highly cash generative and growing business
- Expected to be EPS accretive in the first full year of ownership
- Returns exceed QinetiQ's cost of capital within three years
- Financed from existing cash resources

Steve Wadey, QinetiQ CEO, said: "This acquisition accelerates the delivery of our strategic priorities to drive growth of our core capabilities in international markets, and to modernise and strengthen our ability to deliver world-class test and evaluation services."

"Meggitt Target Systems is a distinctive business with a strong management team and employees in Canada and the UK who are experts in the development and delivery of unmanned target systems and services. We know the business well having worked together for the past decade and I am delighted to welcome the team to QinetiQ."

This announcement contains inside information and the person responsible for making this announcement is Jon Messent, Company Secretary.



# Team Cormorant reforms for CMLU

A student from the Canadian Forces School of Search and Rescue jumps from a CH-149 during a training sortie at Jarvis Lake, Alberta

DAVID DONALD

**Original equipment manufacturer Leonardo and support provider IMP Aerospace have reformed Team Cormorant to bid for the Cormorant Mid-Life Update (CMLU) requirement.**

Then known as AgustaWestland, Leonardo supplied 15 AW101-519 helicopters to the Royal Canadian Air Force, the aircraft entering service in 2000 as the CH-149 Cormorant. IMP Aerospace has provided full turnkey in-service support to the fleet since.

CMLU is intended to update the fleet to provide another 25 years of service in the search and rescue (SAR) role. A request for proposals is expected next year, with a contract award slated for 2019. The programme covers the current fleet of 14 CH-149s, and also includes the similar VH-71 Kestrel helicopters received when the assets of the former US presidential helicopter programme were acquired by Canada in 2011. Nine aircraft were included in the deal to be used for spares and as a potential source of additional aircraft. These assets are currently

in storage at IMP Aerospace's facility at Halifax, Nova Scotia, and up to seven could potentially be returned to airworthiness.

Under its CMLU solution, Team Cormorant is proposing a common fleet with new avionics and mission systems, advanced radars, sensors, vision enhancement and tracking systems to meet the RCAF's "no fail" search and rescue requirements. The update programme is also intended to reduce operating costs.

Team Cormorant's bid is engineered to retain full existing operating availability during

the undertaking of the upgrade, involving the modification of some VH-71 aircraft to Canada's SAR configuration. When fully implemented, the CMLU programme will allow the expansion of Cormorant coverage from the current three main bases to four. Currently the CH-149s fly from Greenwood, Comox and Gander, leaving the SAR base at Trenton operating Bell CH-146 Griffons. With an increased number of CH-149s, the long range and bad weather capability of the Cormorant would be restored to Trenton.

## RCAF on watch

**Last week, Royal Canadian Air Force CF-188 Hornet fighters began operating on NATO's Airborne Surveillance and Interception Capabilities to meet Iceland's Peacetime Preparedness Needs detachment at Keflavik, Iceland. NATO fighters have periodically deployed to Iceland under this programme since the US Air Force left Keflavik in 2008.**

Each year around three such deployments are undertaken, shared between NATO members, and each deployment typically lasts for a month. During the mission the aircraft are launched to intercept and identify unknown

aircraft flying in the Iceland air defence zone.

The RCAF Hornets arrived in mid-May and conducted local familiarisation sorties before beginning airspace surveillance on 22 May. The six aircraft are from 3 Wing at CFB Bagotville, and are accompanied by around 180 personnel, including a detachment of intercept controllers from 22 Wing at CFB North Bay.

The Air Task Force-Iceland mission is part of Canada's Operation Reassurance, under which forces are deployed to Europe as part of NATO assurance and deterrence missions.



CF-188s operating with Air Task Force-Iceland from Keflavik last week

Canadian Hornets previously deployed to Iceland in March/April 2011 and March/April 2013 as part of Operation Ignition, an Iceland-specific operation

that was subsequently rolled into Reassurance. In September, 4 Wing aircraft will deploy from CFB Cold Lake to Romania as part of Operation Reassurance.





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# Venturing where others cannot



Being shown for the first time at CANSEC is the latest vehicle from UTV International (Booth 3010), which, since 1995, has designed, engineered and manufactured standard and customised very low ground pressure tracked vehicles with high payload capacity and exceptional power-to-weight ratios.

The Voyager four-track articulated 10-ton carrier with a three-speed, front and rear combined hydrostatic drive, powered by a 275hp Cat C7.1 ACERT engine, offers performance

and simplicity that make it very easy to use. It can negotiate slopes as steep as 70 per cent (35°), and the Art three-axis articulation maintains connection between the front and rear car, even when turning while climbing. Its maximum fording depth of 48in (1.2m) allows the Voyager to cross brooks, ditches and even shallow rivers and lakes. With 32ft (10m) of 33in (840mm) wide track on the ground, its low ground pressure of 2.0psi unloaded and 4.1psi fully loaded gives high flotation, leaving only a slight footprint.

The front car can have an open or closed cab, configured for five or six passengers, and has a rear deck, which can be used to mount a crane. The interchangeable rear car can be configured for 12 passengers, dump box, flatbed, fuel or water transport, or container roll on/roll off, demonstrating its high versatility.

UTV vehicles are in service in North and South America and Asia, where they are used by forestry, logging, mining, energy, power and telecoms companies, as well as by the Canadian Forces.

## ISR capability on demand

**Burlington, Ontario-based L3 WESCAM (Booth 201) has launched its MatriX ISR (Intelligence, Surveillance and Reconnaissance) system solutions kits for fixed- and rotary-wing platforms.**

The kits combine a series of best-in-class commercial off-the-shelf (COTS) technologies that provide an advanced level of ISR mission capabilities in airborne platforms that have traditionally conducted missions without them. They offer a low-cost, low-risk approach to extending the mission portfolio of defence and security customers who need to add ISR capability to an existing platform, with the ability to easily revert to the platform's original state.

Included in each MatriX kit is an MX-Series imaging or targeting turret – configured for ISR missions – in addition to a removable console in a

compact walk-on/walk-off, or larger, palletised roll-on/roll-off orientation.

“By integrating fundamental technologies into a streamlined kit, our MatriX solutions can be used to easily convert platforms such as the UH-60 utility Black Hawk and C-130 cargo carrier for ISR missions and then revert them to their original configurations in just a few hours,” said Mike Greenley, president of L3 WESCAM. “The kits contain qualified subsystems

and have proven to be a low-cost, low-risk means of adding a significant level of ISR capability – without affecting traditional mission roles.”

The MatriX ISR solution can transform the UH-60 Black Hawk into one with full ISR capability in as little as six hours, but retaining the helicopter's full utility capability. Removing ISR capabilities and reverting to its original state can be completed in approximately two hours.



## AirWatch over UAE

The Space Flight Laboratory (SFL) (Booth 1036), based at the University of Toronto Institute for Aerospace Studies, has signed a contract to provide Dubai-based Mohammed Bin Rashid Space Centre (MBRSC) with a microsatellite for aerosol and greenhouse gas monitoring. MBRSC is integral to the strategic initiative put in place by the Dubai government to inspire scientific innovation and technological advancement, and to advance sustainable development in the United Arab Emirates.

The DMSat-1 (also known as ‘AirWatch’) satellite will leverage past developments at SFL for a rapidly developed mission that will incorporate two payloads. The primary payload is a multispectral polarimeter used to monitor aerosols – fine particles of liquid and solids in the upper atmosphere normally caused by man-made sources, but also correlating to natural phenomena such as dust storms.

The secondary instrument is a pair of spectrometers that will enable MBRSC to detect greenhouse gases such as carbon dioxide and methane over the UAE. The study of aerosols and greenhouse gases will be conducted by researchers local to the UAE.

In previous missions, SFL's Next-generation Earth Monitoring and Observation (NEMO) platform technology, a key enabler for the mission, has demonstrated precise attitude control and target tracking capabilities that will play a key role in the accurate pointing of the DMSat-1 sensors.

SFL is celebrating 19 years of successful development of complete space missions for all applications – Earth observation, monitoring and remote sensing, asset tracking, communications, science, and technology demonstration – continually pushing the envelope by building big performance into smaller satellites, and meeting customers' demands for tight budgets and short schedules.

SFL, led by Dr Robert E Zee, is Canada's most prolific satellite builder and exporter of satellites internationally.



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# Marine gas turbine targeted at CSC

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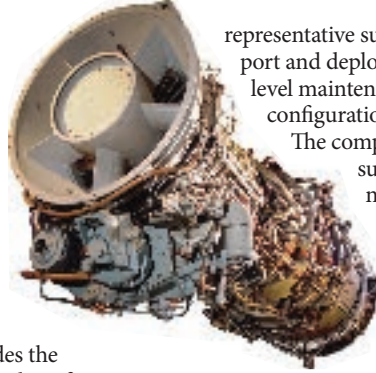
**Building on a long record in Royal Canadian Navy (RCN) service, and a worldwide installed base extending across another 34 navies, GE is using CANSEC 2017 to position its LM2500 gas turbine family to meet the needs of the next-generation Canadian Surface Combatant.**

“GE’s LM2500 family of engines [has set] the benchmark for reliability based on over 14 million operating hours in the marine environment, and another 65 million in industrial applications,” said Brien Bolsinger, GE’s vice president, Marine Operations. “In fact, the RCN has 24 LM2500 marine gas turbines that propel its Halifax-class frigates.”

For the past 16 years, GE (Booth 1721) has provided maintenance

and logistic support services for the RCN’s LM2500 gas turbine fleet under a contract with Public Services and Procurement Canada. The contract provides the RCN with many benefits, most notably the impressive availability of the RCN’s LM2500 fleet over the 16 years of the GE contract, which averaged 99.9 per cent.

According to GE, this agreement includes 24/7 on-site technical support, as well as repair, overhaul and engineering support, parts warehousing and inventory management, field service



representative support (home port and deployed), operational-level maintenance, and configuration management.

The company also provides support of the RCN naval engineering school training curriculum for on-engine and equipment maintenance, and is responsible for the supply and distribution of technical manuals.

“We back these reliable marine engines with extensive in-country engine support capabilities, making our LM2500 gas turbine family the low-risk solution for the RCN’s Canadian Surface Combatant programme,” said Bolsinger.



## Preserving

**Tulmar Safety Systems Inc (Booth 1724) has been awarded a competitive \$4.2 million multi-year contract to supply 12,800 inflatable Maritime Pouch and Hazardous Duty life preservers to the Royal Canadian Navy (RCN). These constant-wear life-saving devices are worn by**



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## life at sea

**members of the RCN and Naval Reserves.**

Tulmar Safety Systems also recently won a contract to provide the Department of National Defence with repair and overhaul and warehousing services for Army flotation equipment. Valued at \$2.2 million, the contract is

fixed for two years and includes six additional one-year option periods.

Under the contract, Tulmar will maintain the department's inventory of Army life preservers, distribute products as needed to operational units and provide technical investigation and engineering support services.

"Since 1992, Tulmar has been designing, building and servicing products that save lives," said the company's president, Barney Bangs. "We are committed to investing in R&D, manufacturing and maintenance programmes that ensure ongoing delivery of this capability in support of Canada's Department of National Defence."

Tulmar's Hammerhead Tactical Life Preserver has been in service with the Department of National Defence for more than 10 years and has recently been acquired for Naval Boarding Teams.

Headquartered in Hawkesbury, Ontario, Tulmar Safety Systems Inc is a fully integrated manufacturer of engineered protective textiles and survivability solutions, supplying aerospace and defence markets around the world.

## Getting it right first time

**Marinvent Corporation (Booth 805) and QRA Corp (Booth 1333) have officially launched the immediate availability of the integrated version of QRA's QVscribe requirements tool with Marinvent's Synthesis certification tools, which will significantly improve the way requirements are handled in aerospace certification programmes. The NSERC Chair in Aerospace Design Engineering (NCADE) at Concordia University is partnering with the two companies as their first university collaborator.**

The NCADE programme strives to improve the quality of design engineering education by partnering with industry to enhance university curriculum through project-based experiential learning opportunities. The

programme will be adopting the use of the Synthesis and QVscribe software tools as part of a year-long course where students work in a large, multidisciplinary team to design a full-size aircraft from a blank sheet of paper.

Marinvent's Synthesis tools save customers enormous amounts of time and money on certification programmes by planning, optimising and managing programmes requiring compliance demonstration, while QVscribe helps engineers to increase the clarity, consistency and quality of their technical documentation.

The main purpose of the tool is to avoid ambiguity, uncertainty and mistakes that can arise from poorly written requirements and to fix the errors found in an early design phase – which is often when mistakes are most commonly made. This partnership with QRA will enhance Synthesis' current capabilities by ensuring that aerospace-related requirements, the main input for Marinvent's software tool suite, are solid from the beginning, resulting in considerably less rework downstream.



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**SAAB**



## A high-tech way to find the range

**Newcon Optik (Booth 1024), based in Toronto, Ontario, is presenting several new high-performance electro-optical devices, in addition to popular legacy items.**

A newly released product is the LRB 6K, a 7x42 high-performance, high-tech laser rangefinder in a sleek and compact form.

The LRB 6K includes a 6,000m (NATO target) measuring range, a built-in digital magnetic compass, an inclinometer, and a GPS receiver.

Through USB and RS-232 interfaces, the LRB 6K can be operated remotely, have its stored data exported, and communicate with external GPS systems and ballistic computers. The combination of these features is said to make the LRB 6K an indispensable tool for military, special forces, and other professional operators.

Introduced last year, Newcon Optik's Seeker M and Seeker S mountable laser rangefinders are designed to boresight with practically any optical system. Their versatile, lightweight and MIL-SPEC design allows for faster and more accurate target acquisition.

The company's new Spotter LRF and Spotter LRF PRO are the first of their kind – combined spotting scope/laser rangefinder systems that match 15-45x optics with a long-distance laser rangefinder in a single package.

Other products on display include Newcon Optik's proven HDS 3AA and NC 1x21 red dot sights, which are designed specifically for military and law enforcement operations, and its full line of image-intensified night vision and thermal imaging systems.

**Established in 1986 in England and operating in Canada since 2001, the International Test Pilots School (ITPS, Booth 1926) is celebrating 30 years of providing specialist training services to the military and civil industry worldwide.**

ITPS is one of only six test pilot schools worldwide accepting international students and its core business is training experienced pilots and engineers in the skills of test and evaluation (T&E) on fixed- and rotary-wing aircraft and unmanned aircraft systems (UASs).

ITPS's portfolio of specialist training programmes includes tactical training such as the 16-week Fighter Weapons Instructors course, most recently presented in collaboration with the Indonesian Air Force, flying out of Iswayudi Air Force Base, East Java. Its expertise has led to a Memorandum of Understanding with the Indonesian Ministry of Defence for support in the training of flight test crews and engineers for the joint Korean/Indonesian KFX Fighter programme, which



will also include advice on the planning and management of the flight testing of their prototypes.

Training contracts are in progress with Turkish Aerospace Industries (TAI) and Korea Aerospace Industries (KAI) to train the flight test teams for

the Turkish TAI 625 helicopter and Korean Light Commercial helicopter (LCH)/Light Armed helicopter (LAH).

European Aviation Safety Agency (EASA) certification as an Approved Training Organisation (ATO) for Flight Test Training is

## Ready to repel

**DEW Engineering of Ottawa (Booth 1111) has unveiled a new armoured shelter, designed to eliminate the vulnerability of military and police services.**

These services have traditionally relied on soft-walled, truck-

mounted or tent shelters for their tactically deployable, mobile and static workspaces such as command posts, communication centres, ambulances and workshops. Lacking armour of any kind, these workspaces leave the

occupants vulnerable to ballistic threats from small-arms weapons typically carried by soldiers, insurgents and criminals, as well as small fragments such as grenade shrapnel and flying debris.

Understanding this critical vulnerability, DEW set out to develop, prototype and demonstrate a new armoured shelter that can be tailored to meet customer requirements for size, shape, functionality and method of employment. The armour is built in as an integral part of the shelter structure.

The Ontario Provincial Police were invited to shoot NIJ Level III and IV threat weapons at the armoured shelter, as well as a variety of other weapons typically used in gun-related criminal activity. All threat rounds were successfully defeated – with no penetrations occurring.

The armour can be adapted into any size of truck shelter or ISO container, and is available in NATO, NIJ and European standards.







Saskatoon-based International Road Dynamics (IRD, Booth 332) a leader in intelligent transportation systems (ITS) for more than 37 years, specialises in providing protection of assets and infrastructure, and transportation and homeland security.

The company's systems have been deployed at air force bases, army bases, military installations and shipyards around the world. IRD also provides security personnel with a fully automated gate inspection system.

Here at CANSEC, IRD is presenting its under vehicle inspection systems – the Under Vehicle Area Scanner (UVAS, pictured) and the Under Vehicle Surveillance System (UVSS). These security systems are capable of effectively scanning the undercarriage of vehicles to provide and analyse images for explosive devices, suspicious objects or contraband such as drugs and weapons. Built for the harshest environments, they also integrate with biometrics, crash barriers, gate arms, mass notification systems and CCTV.

The UVAS, IRD's newest



# No hiding place

offering, automatically scans and displays full colour and/or black and white images of the undercarriage of vehicles with no restrictions on length of vehicles. In less than three seconds, the scanner automatically provides security personnel with a complete timestamped record that includes a picture of the face of the driver, the licence-plate number, a complete full colour scan of the undercarriage, and automatic identification of anomalies.

The system can scan vehicles while they are stationary or

travelling at speeds of up to 75km/h (45mph).

The FLEX series of the UVSS is designed to display, monitor and digitally record crisp, clear digital colour video of a vehicle's underside. Advanced imaging and LED illumination provide clear, high-resolution video of the vehicle's underside. Its open architecture allows it to be connected to existing CCTV; transmit video over IP, fibre optics, coax or wireless; and integrate with automatic licence plate recognition and driver image-capture cameras.

expected in June, making ITPS the only such organisation in Canada.

Demand for training at ITPS has been growing steadily year on year and the company will be moving into a new purpose-built and much larger facility at London International Airport in 2018.



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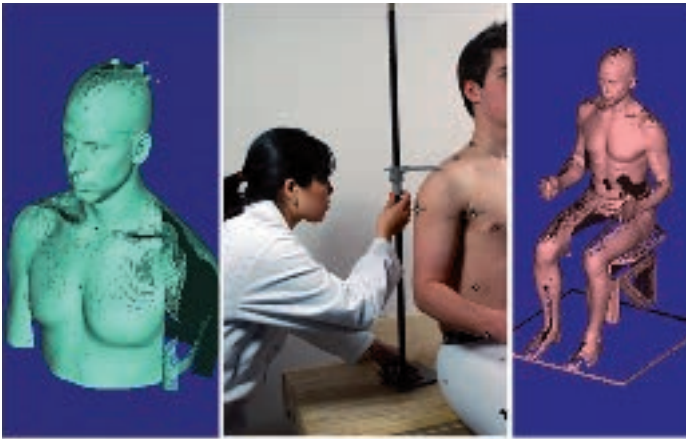
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## Ensuring mission effectiveness

**Big-ticket acquisition of equipment, vehicles or uniform, while ensuring compatibility and keeping within budget, are major challenges. These are being addressed by HumanSystems Incorporated (HSI) with a framework of tools for the Canadian Army's Soldier System Effectiveness (SoSE) programme.**

These easy-to-use tools assess the physical and cognitive variables that affect soldier system effectiveness for the C7A2 weapon system. SoSE links historical and current R&D information about each element in the system to soldier characteristics, knowledge and ability. In turn, this compilation will be used to simplify the work of equipment developers and purchasers, supporting evidence-based procurement and reducing technological risk. The ultimate aim is to improve soldier resilience, performance, protection

and mobility, leading to increased mission effectiveness overall.

Successful equipment procurement requires a full and correct understanding of the needs of users and the challenges under which the equipment will be used.

Military service routinely demands performance in extreme conditions that stress the person and their clothing and equipment. Product expectations given to potential suppliers must reflect likely user challenges to ensure the best product is chosen in a rigorous, comprehensive and fair evaluation process. HSI also provides essential human factors expertise throughout the buying cycle – the earlier, the better – to support evidence-based procurement decisions that mitigate risk, improve equipment effectiveness and reduce overall costs.

SoSE and other systems are being demonstrated on Booth 503.

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# Quick cover

**First-time exhibitor ROBUS Shelters is presenting its mobile, self-deploying shelter on Outside Booth 3027, which can be installed on flat, inclined or pathless terrain requiring no more than one or two operators.**

The shelter is designed to withstand applied loads and extreme weather conditions including high-velocity winds and temperature variations, which increases efficiencies in manpower, logistics, energy and time.

The shelter is integrated into a custom double-axle steel trailer that can be towed by a standard half-ton truck and can also be transported in ISO standard shipping containers.

Once in position, the shelter can deploy in less than four minutes, and can be fully set up in less than

15 minutes. The shelter can be packed in less than 20 minutes by two operators.

The smallest size of shelter currently offered is 16m in



diameter, with a surface area of 200m<sup>2</sup>.

The largest size, although not yet built, can be more than 45m in diameter, with a surface area of more than 1,680m<sup>2</sup>.

The proprietary deployment mechanism allows for a minimum footprint for logistic purposes, and once deployed, the shelter qualifies as a permanent structure



**Cesaroni Technology Inc (CTI, Booth 724) is expanding its line-up of lead-free frangible bullets to include 300AAC Blackout and .338 Lapua calibres as well as a number of shotgun projectiles.**

The product line ranges from .22LR to .50BMG and includes all popular pistol and rifle calibres in both copper-jacketed and unjacketed styles including 4.6mm, 5.56x45, 9mm, .40S&W, 7.62x39 and 7.62x51 calibres. Shotgun projectiles include both spherical buckshot and slug designs for 12-gauge applications.

The bullets offer a number of advantages over other lead-free designs including reduced

ricochet, reduced splashback, improved accuracy, improved robustness and increased lethality – all at a very competitive price.

Sarasota, Florida-based CTI has been providing lead-free frangible bullets to all major ammunition manufacturers worldwide for more than 20 years. Since their market introduction in the mid-1990s, the company has provided more than 1 billion bullets to defence and law enforcement users around the globe, including Canada's Department of National Defence (DND) and the US Department of Defense (DoD) for both Close Quarters Battle (CQB) training and tactical operations.



# er-up



under the Canadian building code.

As a result of its heavy load capacity, the shelter allows for integration of many different types of systems, from turrets to communications beacons. The shelter can also function as a mobile hangar, with a special customisation that allows for ultra-wide clearance of aircraft wingspans.

## Flameless heat on the move

**South Dakota, USA-based Therm Dynamics has been a leading supplier of flameless portable heaters to the oil and gas and aviation industries worldwide since 1998, providing a wide range of heating solutions.**

The TD500-GSE flameless heat cart is compact, completely portable and safe. The company's patented technology of agitating hydraulic oil in a flameless, spark-less and low-pressure environment is what provides clean, dry heat for all narrow-to wide-body aircraft. It represents the next generation in portable heat technology in the airline industry.

Therm Dynamics has also introduced the TD500 IDF (indirect-fired) self-contained generator portable heater, which has replaced the old standard Herman Nelson flamed heaters

used around the globe since the Second World War.

The simple, safe, versatile heater is designed to provide operators

with high heat to de-ice wings, pre-heat engines, thaw fluids and frozen doors or function as a portable maintenance station. Whatever the requirement, the TD500 IDF will exceed expectations, the company claims. It has documented records that its heaters can achieve more than 30,000 hours of successful operation and can withstand the harshest conditions.



The TD500 IDF has replaced the old Herman Nelson flamed heaters

## No signal is missed

**Access to eavesdropping and electronic bugging devices is becoming easier and more affordable, as demonstrated by Contretron Inc (Booth 528), a certified Research Electronics International (REI) distributor, with REI's new ANDRE Advanced Near-field Detection Receiver.**

A hand-held broadband receiver that detects and assists in locating nearby RF, infrared, visible light, carrier current and other types of transmitters, ANDRE detects signal activity in its vicinity and displays changes in signal strength over time, allowing users to quickly locate the source of transmissions. Its frequency counter provides quick identification of the signal frequency and outputs additional information to an automatic signal list generator.

Antenna probes included with the ANDRE can be used to sweep rooms and objects in search of known, unknown, illegal, disruptive or interfering transmitters from 10kHz to 6GHz.



A 3.5in touchscreen displays all of the operation controls and frequency activity. Eight displayed time intervals can be selected, ranging from five seconds to 24 hours. This helps identify pulsing signals and shows historical peaks, to ensure nothing will be missed. Manual and automatic threshold settings notify the user when a signal exceeds defined strength levels with haptic, audible and visual alerts. The zoom function adjusts the viewable scale to a 30dB span to improve the view of RF activity.

ANDRE replaces the CPM-700 Broadband detector that is discontinued but will still be supported with parts and service.

Contretron has been designing and manufacturing innovative test equipment for the telecommunications, utility and security industries since 1986. It also specialises in electronic counter-surveillance, advising governments and law enforcement agencies on the detection of illegal electronic eavesdropping devices.



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## Volunteer for a stronger Canada

Everyone probably knows that **The Royal Canadian Legion (Booth 135) is an organisation that supports Canada's Veterans and honours their sacrifice. It may have been seen hosting Remembrance Day ceremonies or distributing poppies during its annual Poppy Campaign. Perhaps people have heard or read stories about the Legion supporting local Veterans and their families.**

What might not be realised is that the Legion does so much more, and once more is learned about it, the population may have a much stronger connection to the Legion than they thought! Yes, a key focus of the work is to honour and support Canada's Veterans, but it is also a grass-roots organisation with volunteer community-based activities that help build a stronger Canada from coast to coast to coast.

While many Legionnaires are Veterans, its members also include families of Veterans and members of the public with no military connections. Their common goal: to support Veterans and help their community. In fact, with more than 1,400 branches and more than 275,000 members across Canada, the Legion provides one of the largest volunteer bases in the country.

Legionnaires contribute millions of volunteer hours each year. They are probably best known for distributing poppies during the Remembrance period, helping raise money for Veterans and their families and ensuring

Canadians "never forget". Yet behind the scenes, Legionnaires also volunteer in their branches, providing essential programmes and services for Veterans, seniors and families in need, supporting youth education and leadership programmes, hosting branch activities and fundraisers, and more.

Legion branches are the cornerstones of many Canadian towns and communities, providing central places for people to gather and feel connected to their neighbours. In many places, they serve as the primary community centre, hosting weddings, town meetings, community BBQs, memorial services, and other important events and activities. And in times of local or regional crisis, Legionnaires are there to support those who have been adversely affected by an emergency.

Branches are almost entirely run by volunteers, and Legionnaires are the lifeblood of the organisation. From service to the country to service to the community, Legion members impact the lives of their fellow citizens, in particular Veterans, seniors and youth. All this good work could not possibly be accomplished without the support of its hardworking and dedicated volunteers.

This National Volunteer Week, the Legion sends a special thank you to its Legion members for their support and dedication. It encourages all Canadians to learn how they can get involved and make a difference too!

# More gas turbine Korean FFX-II

**RICHARD SCOTT**

**Rolls-Royce (Booth 1621) has been contracted by Hyundai Heavy Industries (HHI) to supply a further three MT30 marine gas turbines to power the next three ships in the Republic of Korea Navy's (RoKN's) FFX Batch 2 Daegu class frigate programme.**

In this application, a single MT30 is being fitted as part of a combined diesel electric or gas turbine (CODLOG) machinery arrangement.

The company has previously delivered a single MT30 for the FFX Batch 2 first of class ROKS *Daegu*, which is currently completing at the Okpo yard of Daewoo Shipbuilding and Marine Engineering (DSME). Ship two will also be built by DSME, while ships three and four are under contract to HHI's Special and Naval Shipbuilding Division.

The MT30 gas turbines for ships two and three are due to be delivered in the second half of 2018, and for ship four at the start of 2019. The engine is shipped to South Korea for packaging by HHI's Engine & Machinery Division. This process sees the gas turbine unit integrated into a steel enclosure, which also houses air inlets, exhausts and ancillary equipment, prior to installation in the ship.

For the FFX Batch 2

programme, lead ship *Daegu* was launched from DSME's Okpo yard in June 2016. The ship is scheduled for delivery to the RoKN in late 2017 and expected to be commissioned in late 2018.

According to Don Roussinos, Rolls-Royce, president – naval, the MT30 gas turbine has been successfully installed in *Daegu* and "is currently successfully supporting the commissioning



## Enhanced capabilities

**StandardAero (Booth 1921) recently announced that it has expanded its repair and servicing capabilities to include eight new military engines.**

The company is now qualified to perform component repairs for the following engines either independently, under subcontract, with teaming agreements, or directly contracted with multiple customers/OEMs: F100, F110, F117, F118, F119, TF33, J85 and naval LM2500. The company

has also expanded its capabilities on several commercial engine platforms and it has expanded its international capabilities with CAAC authorisations/approvals for repairing PW4000, V2500, GE90, CF34, CFM56 and Honeywell engines.

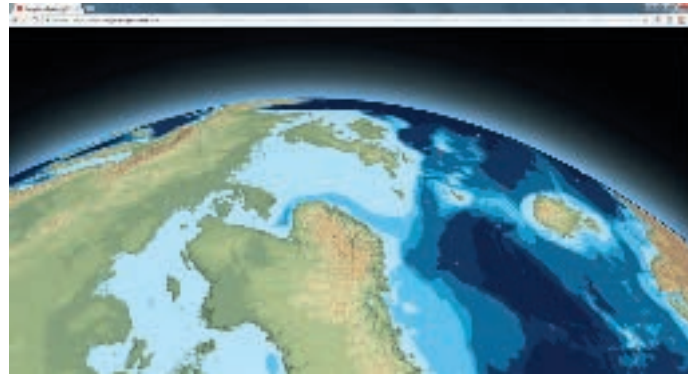
As well as its work on engine platforms, StandardAero is an OEM aligned component repair provider for aerospace and industrial gas turbine engine manufacturers and operators around the world.



# ines for frigates

of the [CODLOG] propulsion system". He added: "We understand that MT30 has powered the ship to meet its full speed requirement."

Derived from Rolls-Royce Trent aero engine technology, the MT30 is initially built as separate modules on the same build line as the Trent in Derby. It is then assembled and tested at the company's Bristol facility.



## Map engine for cloud applications

Kongsberg Geospatial (Booth 913), the Ottawa-based developer of real-time, mission-critical, geospatial and command and control software, has launched a browser-based 3D map engine to deliver high-performance geospatial applications in the cloud.

The new engine, called TerraLens WebCore, has been written from the ground up to use next-generation technologies to provide highly efficient 3D rendering in a HTML5 browser environment and provide a level of performance approaching that of native applications compiled

for a specific platform. "Modern HTML5 applications are shader-based, which means that on computers with a GPU they can provide near-native performance," said Kongsberg Geospatial CTO Gilles Bessens. "This makes it possible to roll out extremely powerful cloud-based applications on thin clients."

The TerraLens WebCore map engine has been engineered to provide the best possible performance in a browser-based 3D application, but it also shares a common focus with Kongsberg Geospatial's native TerraLens platform on the real-time display of moving tracks. This focus on real-time geospatial data is the primary differentiator from other browser-based 3D map engines, and is intended to support the development of distributed command and control and ISTAR (intelligence, surveillance, target acquisition and reconnaissance) applications.

TerraLens WebCore will be publicly available in autumn 2017.

## Survivability safeguarded

S4 Tactical & Defence (Booth 435) has signed an exclusive Canada, USA and South America partnership with TenCate Advanced Armor, whose products will now be available in Canada.

TenCate provides survivability systems for land, sea and air platforms, and personal protection equipment. Among products offered are various ballistic inserts and the Targa-light shield. The latter is available in three distinct types: Targa-light CX is the high-performance range made with



composites of high-grade ceramics, silicon carbide or boron carbide and a range of different fibre materials, including aramids and high-performance polyethylene (PE). It is the most lightweight shield and combines highest ballistic protection with maximum comfort. CS is the cost-effective range, which combines 100 per

cent ballistic protection with lower cost. Both the CX and CS also provide protection against lead core and armour-piercing ammunition. PF is the range of shields made with fibre only, and provides protection against lead core and mild steel core ammunition.

S4 has also announced an exclusive Canadian partnership with XION Protective Gear, which produces a variety of protective undergarments for the purpose of the PPE (Personal Protective Equipment) market. The XION base layer protects against blunt trauma impact.



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## Controlling spectrum situational awareness

**LS telcom (Booth 230) is a global leader in spectrum system integration delivering spectrum and electronic warfare hardware, software, system integration, training, mentoring and consultancy. The company has added highly experienced ex-military and defence experts to the organisation to leverage the clear and defined needs of the defence and security market.**

Its wide range of products and systems includes surveillance deliverables, based on ease of compatibility and interoperability with legacy national systems. Data can be stored for post-event analysis or networked back for in-depth real-time analysis.

LS OBSERVER Surveillance systems enable large areas to be quickly and electronically mapped and the collected data can be archived and used historically to deliver intelligence trends analysis. The sensors come in various forms – fixed, transportable, mobile and portable – and can all be networked into a grid.

LS telcom's software package SPECTRA supports spectrum planning, allocation, technical frequency and interference analysis, licensing and billing to national and international co-ordination. Special applications include white space management, dynamic spectrum access, special event planning and online (e-/mobile) licensing. SPECTRA can be accessed on-site or via a cloud-based application. SPECTRAMpt covers all areas of electromagnetic spectrum operations from spectrum management, frequency assignment/allotment, policy, host nation and international co-ordination and electronic warfare operational planning. Spectrum 'Situational Awareness' of the electronic environment allows any changes to the RF spectrum to be identified using Auto Violation Detection, further allowing the identification and/or cueing of other sensors and effectors.

LS telcom has provided spectrum system solutions to more than 70 government organisations.

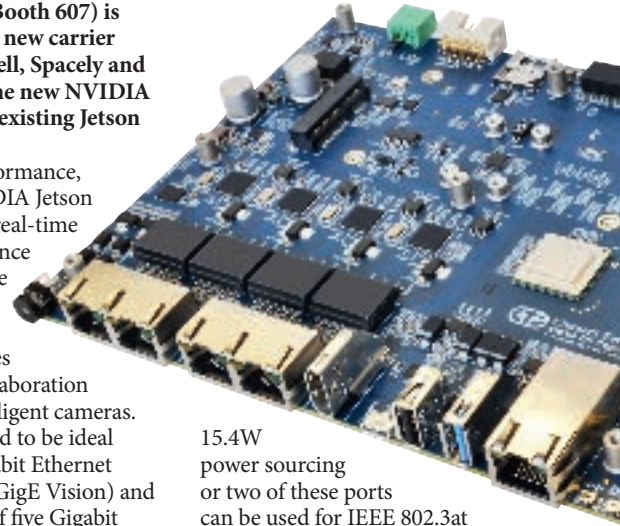
## Embedded inte

**Connect Tech (Booth 607) is displaying three new carrier boards – Cogswell, Spacely and Sprocket – for the new NVIDIA Jetson TX2 and existing Jetson TX1 products.**

The high-performance, low-power NVIDIA Jetson platform brings real-time artificial intelligence (AI) performance to edge devices, ranging from robots and drones to enterprise collaboration devices and intelligent cameras.

Cogswell is said to be ideal for use with Gigabit Ethernet vision cameras (GigE Vision) and includes a total of five Gigabit Ethernet ports. Four of these ports can be used for IEEE 802.3af (PoE)

15.4W power sourcing or two of these ports can be used for IEEE 802.3at (PoE+) 25.5W power sourcing. Additionally, the Cogswell carrier



## Clear and precise

**Creating and maintaining technical publications and customer support data across an international enterprise can be a challenge, especially with a diverse product line and highly complex applications. Lionbridge and CANSEC sponsor CLS LexiTech provide support for the introduction of new products and maintaining current in-service products for their customers' requirements.**

Its multi-shore delivery platform, paired with expertise in sectors such as aerospace, defence, automotive, maritime, heavy equipment, IT, and life sciences, enables its teams to produce the highest quality documentation. With experts in key industry

standards such as S1000D and DITA, its project managers, technical authors, illustrators, and multimedia specialists work with the client's product development and engineering teams to gather, structure, create, and present information in a way that meets end user requirements and industry specifications in a clear and consistent manner.

As a leading global company with a focus on technical content, proficiency in 3D animations, augmented reality, virtual reality and integrated training, clients can avail themselves of its innovative solutions in hard copy, digital,



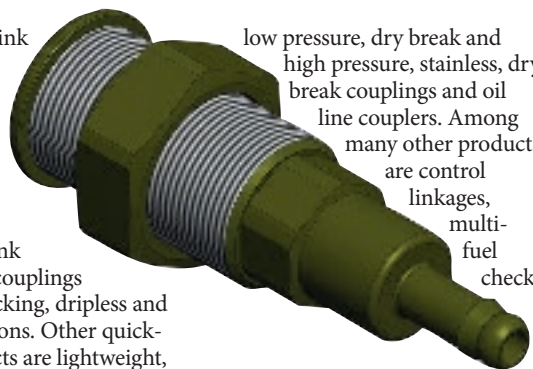
## Quick connections

**Battlefield International Inc (Booth 1207) of Cayuga, Ontario, designs and manufactures aerospace fuel systems and quick-connects, and mechanical, custom and lightweight components.**

Yet the company is best known

for its EnduroLink fuel coupler, which is now the world standard for unmanned vehicle integration.

Its EnduroLink quick connect couplings include non-locking, dripless and twist-lock versions. Other quick-connect products are lightweight,



low pressure, dry break and high pressure, stainless, dry break couplings and oil line couplers. Among many other products are control linkages, multi-fuel check

valves, fuel pumping systems, and quick exhaust valves.

After securing multiple contracts in 2016, Battlefield International has responded to the increased demand for fluid system products by purchasing five robust computerised numerical control (CNC) milling machines, which will ensure that the company can maintain its rapid R&D and prototype programme, while balancing production needs.



# Intelligence

enables HDMI video, CAN, USB 3.0, USB 2.0, USB OTG, Mini-PCIe/mSATA expansion, and two RS-232 serial ports. Spacely targets unmanned vehicles and other applications where situational awareness is critical. It enables users to simultaneously capture up to 6 MIPI CSI-2 cameras as well as offering built-in expansion for a GPS/GNSS module. It includes a multi-I/O port specifically designed to enable easy connection to OEM autopilots such as the Pixhawk. Other onboard interconnects include 2x GbE, 1x HDMI, USB 3.0, USB 2.0,

USB OTG, as well as miniPCIe and mSATA expansion.

Sprocket is the company's smallest and lowest profile solution at only \$99. Sprocket and Jetson TX2 or TX1 can be mounted flat in the smallest of areas, perfect for space-constrained payloads such as drones. Designed to match the NVIDIA Jetson module form factor, Sprocket's design includes 1x USB OTG, 1x MIPI CSI-2 Input, 2x 3.3V UART, 2x I2C, and 4x GPIO.

"Connect Tech's extensive Jetson product line enables developers everywhere to quickly deploy Jetson-powered solutions to the field," said Murali Gopalakrishna, head of product management, intelligent machines at NVIDIA.

The Guelph, Ontario-based company is also promoting the first commercial-off-the-shelf COM Express Type 7 carrier board, and the new SMARC 2.0 carrier board.



## US Army evaluates MCS on Stryker

ROBIN HUGHES

**The US Army's 2nd Cavalry Regiment (2CR) stationed in Vilseck, Germany, is conducting a field evaluation of the General Dynamics Land Systems – Canada Stryker 8x8 infantry combat vehicle equipped with a Saab Mobile Camouflage System (MCS) set.**

Developed by Saab's Barracuda business unit, the MCS technology is essentially a tailor-made, multipurpose, multispectral 'uniform' optimised in colour, design and properties for all theatres, and designed to enhance the survivability, sustainability and logistics of a wheeled vehicle or tracked platform relative to a specific operational environment or requirement. The MCS system provides a significantly reduced probability of detection visually and from sensors in the near-infrared, short-wave infrared, mid-wave infrared, long-wave infrared and broadband radar wavebands, including target acquisition and smart ammunition sensors.

2CR will deploy four MCS-equipped Stryker ICV sets during ongoing unit operational training in Hohenfels, Germany, in support of Operation Atlantic Resolve and the Enhanced Forward Presence Missions. Atlantic Resolve is a US-led multinational training and co-operation activity designed to demonstrate the US commitment to NATO and the US-European strategic partnership through collective security, and contribute to regional stability in light of the Russian intervention in Ukraine.

Enhanced Forward Presence is a NATO forward deployed defence and deterrence posture in Eastern Europe to protect and reassure Alliance eastern member states.

Integration of MCS could eliminate field-improvised vehicle camouflage such as cutting up camouflage nets, and obviate the requirement, and associated costs, of repainting vehicles to match alternative operational environments.

Saab and 2CR have worked in close co-operation not only to develop a signature management system that enhances the survivability of the Stryker vehicle, but also to achieve rapid equipping of MCS on the platform, a Saab spokesperson said.

The four Stryker MCS sets are funded and delivered by Saab, while 2CR has supported ongoing testing and training with the systems on the platform. The current evaluation will last about 60 days; this will be followed by feedback and a formal evaluation, which is expected by the end of June.

Any MCS procurement by the US Army will need to be manufactured by and sourced from Barracuda in the US, in compliance with the 1994 Berry Amendment – a statutory requirement that restricts the Department of Defense (DoD) from using any available funding for the procurement of clothing, fabrics, fibres, yarns and other made-up textiles (among other items), that are not grown, reprocessed, reused or produced in the US.



and cloud formatting, from consulting to content development to publishing.

## Cockpit iPad

**ABC Completions Inc has obtained Transport Canada STC Approval for the iPad as a Class II Electronic Flight Bag, complete with electrical connection to aircraft systems for the Bombardier Global Series aircraft. The TCCA STC certification complements the existing FAA STC 3199NY. The system is certified for taxi, take-off and landing.**

The iPad tablet is secured within a custom-designed aluminium housing that enables access to all iPad controls, including the camera. All models of iPads are supported, making future tablet updates simple. The articulating, fully adjustable custom-designed mount allows for a comfortable positioning of the iPad, allowing charts to be viewed in both landscape and portrait modes.

ABC Completions Inc can provide complete installation kits, or dispatch a mobile installation team.



The acquisition has also enabled the production of lightweight, full-flow fluid quick disconnects in larger sizes through to 4in (100mm) nominal flow diameter, to meet widespread market interest in larger body sizes. Earlier this year, the company announced that it has been nominated by Insitu as official manufacturer and supplier of its EnduroLink UAV products for use on the latest ScanEagle N20 propulsion system.



**CANSEC**

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