

# Army Guide monthly



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**Defence Industry**

quarter of 2012.

**Force Protection Submits Bid for Canada's Tactical Armoured Patrol Vehicle Project**

Force Protection Industries, Inc., a FORCE PROTECTION, INC. group company, today announced the submission of a bid and test vehicle to the Canadian Forces for the Tactical Armoured Patrol Vehicle (TAPV) project.

Force Protection is offering the Canadian Forces a 6x6 variant of the battle proven Cougar wheeled combat vehicle developed by Force Protection to meet the TAPV requirements. Force Protection will be the design authority and have overall responsibility for the acquisition contract to supply the TAPV vehicles and maintain configuration control.

As Force Protection's main Canadian partner, CAE will have overall responsibility for the comprehensive in-service support (ISS) solution, including: vehicle operator and mission training systems; engineering information environment; fleet management services; systems engineering support; and, lifecycle and integrated logistics support services. CAE will also be responsible for assembling a pan-Canadian team of companies to develop and support any country-specific requirements for Canada's replacement fleet of tactical armored patrol vehicles.

Force Protection and CAE previously announced a collaboration that includes Elbit Systems as the provider for a dual remote weapons system (DRWS) and Lockheed Martin Canada as the provider of C4ISR suite for the Timberwolf vehicle. Elbit Systems' Land and C4I DRWS was chosen based on its superior performance, reliability and ease of integration. Lockheed Martin Canada was chosen as the C4ISR integrator for Timberwolf based on its recognized capability in the development, production and support for integrated C4 systems.

Randy Hutcherson, Chief of Business Development for Force Protection, said, "Partnered with CAE, Force Protection is pleased to formally submit Timberwolf as the optimal solution for the TAPV project. Along with our key providers, we are committed to offering the Canadian Forces a highly-protected and reliable vehicle, as well as Industrial and Regional Benefits that will contribute to investment in Canadian industry and provide further experience and capability in the armored vehicle market."

A contract award to the final selected bidder for the TAPV requirement is currently expected by the second

**Exhibitions****Patria at the international defence industry exhibition MSPO in Poland**

Patria takes part in the international defence industry exhibition MSPO held in Targi Kielce Exhibition and Congress Centre in Kielce, Poland on 5 - 8 September 2011. In the exhibition Patria highlights one of its key products, the Patria AMV (Armoured Modular Vehicle).

In the exhibition, visitors will have the opportunity to see Rosomak (Polish for Wolverine), which is a locally produced Polish version of the Patria AMV. Patria's Polish partner, Wojskowe Zakłady Mechaniczne, is a local expert in the production of the Rosomaks.

Patria's display includes a KTO Rosomak with Oto Melara 30mm Hitfist turret integrated with Spike launchers. Another KTO Rosomak with CT-CV 105mm turret is also showcased. In addition the display includes a KTO Rosomak Driving simulator.

Patria's display is located in the exhibition booth ZF-6, together with WZM.

**Number of contracted Patria AMV 8x8 exceeds 1,400 pcs**

Armoured wheeled vehicles are among Patria's most important export products. Patria AMV has become a popular choice in its most significant market areas and the number of contracted Patria AMV 8x8 exceeds 1,400 vehicles.

Patria AMV is contracted among others by the Finnish, Polish and Swedish Defence Forces, and it has been fielded in ISAF operation since the year 2007. In 2010 Patria won the competitive bidding process organized by the Swedish Defence Materiel Administration (FMV) for 113 armoured vehicles.

As an experienced producer of armoured wheeled vehicles, Patria perfects its products combining high payload with the latest technology. These features enable the simultaneous integration of a high level of protection and heavy weapon systems without compromising the mobility of the vehicle.

**Future Technologies****BAE Systems Conjures Up Invisibility Cloak for Armoured Vehicles**

LIRNSKJLDSVIK, Sweden -- BAE Systems has tested an 'invisibility cloak' that allows a vehicle to blend into its surroundings.

The system, which can work over infra-red and other frequencies, will be displayed in infra-red mode on a BAE Systems CV90 armoured vehicle at the UK Defence and Security Equipment International exhibition later this month.

Known as "Adaptiv", the patented technology is based on sheets of hexagonal 'pixels' that can change

temperature very rapidly. On-board cameras pick up the background scenery and display that infra-red image on the vehicle, allowing even a moving tank to match its surroundings. Alternatively, it can mimic another vehicle or display identification tags, reducing the risk of fratricide.

Current work focuses mainly on the infra-red spectrum, as this is most important to the Swedish Defence Materiel Administration (FMV), which funds part of the work. However, BAE Systems engineers have combined the pixels with other technologies, which provide camouflage in other parts of the electro-magnetic spectrum at the same time to provide all-round stealth, which will be developed further over the next few years.

Trials by BAE Systems in mid-July showed that one side of a CV90 could be made effectively invisible or appear to be other objects, including a 4x4 vehicle, when viewed in the infra-red spectrum.

Project manager, Peder Sjulund explains: "Earlier attempts at similar cloaking devices have hit problems because of cost, excessive power requirements or because they were insufficiently robust. Our panels can be made so strong that they provide useful armour protection and consume relatively low levels of electricity, especially when the vehicle is at rest in 'stealth recce' mode and generator output is low."

He adds: "We can resize the pixels to achieve stealth for different ranges. A warship or building, for instance, might not need close-up stealth, so could be fitted with larger panels."



## Defence Industry

### Textron TAPV Team Submits Tactical Armoured Patrol Vehicle Proposal



OTTAWA, Canada -- Textron Systems Canada Inc., a Textron Inc. company, announced today that it has submitted its proposal for the Canadian Forces Tactical Armoured Patrol Vehicle (TAPV) program.

The Textron TAPV Team, led by Textron Systems Canada, includes Textron Marine & Land Systems and Rheinmetall Canada. Additional key Canadian suppliers include: Kongsberg Protech Systems Canada, a subcontractor to Rheinmetall Canada for the Remote Weapons Systems; and Engineering Office Deisenroth Canada (EODC), a subcontractor direct to Textron Systems Canada for add-on armour.

A contract for the TAPV program to procure 500 vehicles, with an option for up to 100 more, is expected

to be awarded in early 2012.

"The Textron TAPV Team is pleased to be offering a 4 by 4 armoured vehicle that will provide the Canadian Forces with an unmatched blend of survivability, protection, power, mobility and versatility," said Neil Rutter, general manager of Textron Systems Canada. "We also have submitted a comprehensive Industrial and Regional Benefits plan that effectively engages Canadian companies from coast to coast, provides jobs to Canadians, and provides substantial Canadian content in each vehicle."

Textron's proposed TAPV, specifically engineered to meet Canadian Forces requirements, draws on Textron Marine & Land Systems' more than 45 years of experience in the design and production of armoured vehicles. Building from the combat-tested Armored Security Vehicle platform, Textron's TAPV has undergone five years of extensive research and development. The result is a technology readiness level (TRL) 8 vehicle, designed to deliver outstanding performance and sustainability for a broad spectrum of operations in the world's most challenging environments.

If awarded the TAPV project, Ottawa-based Textron Systems Canada, as prime contractor, will provide overall program and configuration management, act as the design authority for change management, coordinate vehicle integration activities by Canadian subcontractors, manage the 25-year In-Service Support contract, and execute the Industrial and Regional Benefits program.

Rheinmetall Canada ([www.rheinmetall.ca](http://www.rheinmetall.ca)), at its facilities in Saint-Jean-sur-Richelieu and Ottawa, will perform multiple integration functions and final vehicle assembly to include the remote weapons station and government furnished equipment, and play a large role in the program's long-term system support.

Kongsberg Protech Systems Canada ([www.kongsberg.com/en/KPS](http://www.kongsberg.com/en/KPS)) will provide its Remote Weapon Station (RWS) for the Textron TAPV vehicle through a subcontract with Rheinmetall Canada. Kongsberg would be responsible for assembly, testing, and delivery of its RWS for the TAPV program, using its production facility in London, Ontario.

EODC ([www.eodc.ca](http://www.eodc.ca)), an IBD-owned Canadian company based in Ottawa, is offering IBD's fourth-generation Advanced Modular Armour Protection (AMAP) technology in support of the Textron TAPV. This newest ballistic protection technology includes the use of nano-ceramics and nano-steels to provide enhanced vehicle survivability at lower weight levels.

Textron Systems Canada brings the broad capabilities of Textron Systems' operating units to Canadian customers. The company is currently focused on the Canadian Forces' Tactical Armoured Patrol Vehicle program. More information is available at [www.textronsystems.ca](http://www.textronsystems.ca) and [www.textrontapv.ca](http://www.textrontapv.ca).





## Training And Simulators

### Australia Defence Force chooses Meggitt virtual training



Meggitt, a leading international company specialising in components and sub-systems for aerospace, defence and energy markets announces that Meggitt Training Systems has won an AUD\$29M (USD\$30.8M) contract with the Australian Defence Force (ADF) to operate and maintain the primary small and supporting arms simulation training centres known as WTSS (Weapon Training Simulation System) facilities.

Created to train soldiers, sailors and airmen in the rules of engagement, judgment, marksmanship and indirect fire, the WTSS programme, which includes Indirect Fire Forward Air Control (I-FACT) and Indirect Fire Training (IFT) systems, is provided exclusively by Meggitt Training Systems. It builds on a decade of supply to the ADF of systems, weapons, software, courseware, systems operation, maintenance and site management. Overall, Meggitt has a significant profile in Australia, with an estimated 90% share of the market in dismounted virtual weapons training.

The operations and maintenance contract, running from July 2011 to June 2016, follows an original award in 1999. Coordinated from Meggitt's facility in Albury, New South Wales, Meggitt Training Systems will provide operations and maintenance for 18 sites located at major troop locations in every state and territory throughout Australia. The contract will be supported by around 70 Meggitt personnel.

Ronald Vadas, President of Meggitt Training Systems commented: "This contract award reflects ten years supporting the ADF's training vision with innovative training and simulation systems. They will continue to be backed up by our highly experienced trainers—mostly ex-service personnel—who know how to maximise the skills, knowledge and behaviours needed for success on the modern battlefield."

## Defence Industry

### Updated information regarding the CROWS program

KONGSBERG wish to contribute to give full information regarding the CROWS program to the market.

US Army has announced new, revised information regarding the program. The changes imply a lower volume than previously announced by the US Army. KONGSBERG consider that the change is not a direct

consequence of reduced need for CROWS-systems but rather a changed purchasing strategy due to the current budget situation in the USA. US Army estimates the upcoming tender to comprise 3 000 systems, in addition to spare parts and upgrades. Total value is estimated to MUSD 970. The change also expresses that there will be only one supplier. KONGSBERG's design is still the chosen design for the competition.

CROWS is a joint acquisition program for weapon stations for the US Army's vehicle programs. A common solution will result in substantial efficiency gains in respect of protection, training, support and

further development. The Protector Weapon Control System protects military troops by allowing the vehicle's weapons to be operated from a protected position inside the vehicle.



## Defence Industry

### Elbit Systems Successfully Completed Customer Acceptance Tests of First 30mm Unmanned Turret Supplied to the Brazilian Army



Haifa, Israel -- Elbit Systems Ltd. ("ESLT") announced today that it has successfully concluded customer acceptance tests of first 30mm unmanned turret UT30BR, integrated into the Brazilian IVECO 6X6 Guarani vehicle.

The unmanned turret was fielded at CAEx (the Brazilian Army's Marambaia testing facility in Rio de Janeiro), testing all its operational functions as well as firing both static and moving targets. The tests were successfully completed, complying to all requirements and to the customer's full satisfaction.

In 2009, after a bid between world leading turrets manufacturers, Elbit Systems was selected to supply unmanned turrets to the Brazilian Army's Land Forces. This multi-year program holds great potential to the company in terms of future procurement.

Earlier this year (2011), Elbit Systems' Brazilian subsidiary, AEL SISTEMAS SA, ("AEL") was awarded a framework contract, for the supply of UT30BR 30 mm Unmanned Turrets to the Brazilian Army's Land Forces, as part of the Guarani Project.

Elbit Systems' unmanned turret is a complete system, incorporating a 30mm automatic cannon, a 7.62 mm coaxial machine gun, a Laser Warning System (LWS), commander panoramic sight and smoke grenade

launchers. In addition to the aforementioned elements, Elbit Systems' unmanned turret is fully dual axis stabilized and combines an automatic target tracker.

The unmanned turret features Elbit Systems' proprietary technology, answering a suitable solution to the asymmetric warfare challenges. The unique design, operated from within the crew compartment without exposure to external hazards, is based on extensive battlefield experience in full scale and low intensity conflicts, and attests to Elbit Systems' leadership in the field of turret and fire control systems.



## Robots

### iRobot Updates U.S. Army Brigade Combat Team Modernization Contract Status

BEDFORD, Mass. -- iRobot Corp., a leader in delivering robotic technology-based solutions, today announced that it had received a partial termination for convenience notification from The Boeing Company of the contract for the design and development of the 320 SUGV robot.

#### iRobot Updates U.S. Army Brigade Combat Team Modernization Contract Status

Boeing, as lead system integrator under the U.S. Army's Brigade Combat Team Modernization Program, was the prime contractor. iRobot developed the technology as a subcontractor to Boeing. The effective date of the termination is September 30, 2011.

"This notification is consistent with our expectations," said Robert Moses, president of iRobot's Government and Industrial Robots division. "The SUGV robot has proven its worth as a man-portable, rugged and easy-to-use robot. Warfighters are using it to perform a wide variety of missions due to its success on the battlefield. Given current budget pressures, the Department of Defense is pursuing more cost-effective contractual arrangements. iRobot is in continuing discussions directly with the Army to help it reduce costs for the development and acquisition of SUGVs in 2011 and 2012," he added.



## Training And Simulators

### SAIC Awarded \$46 Million Contract by U.S. Army PEO for Simulation, Training and Instrumentation

MCLEAN, Va. -- Science Applications International Corporation (SAIC) announced it was awarded a prime contract by the U.S. Army Program Executive Office for Simulation, Training and Instrumentation (PEO STRI) to build the Egyptian Armed Forces Combat Training Center (AFCTC) No. 3 for the Training Authority of the Egyptian Armed Forces, Ministry of Defense, in Cairo, Egypt.

The single-award contract has a three-year period of performance and a total value of more than \$46 million. Work will be performed primarily in Orlando, Fla. and San Diego, Calif.

SAIC previously developed and implemented AFCTC No. 1 and No. 2, as well as a home station training capability for the Egyptian Armed Forces under direct commercial contracts with the Government of Egypt.

Under the contract, SAIC will design and build a fixed and mobile AFCTC for the Egyptian Armed Forces that is interoperable with AFCTC No. 1 and 2 in order to accommodate the execution of large training exercises. The AFCTC will function at the brigade level, provide realistic force-on-force training, and consist of software and hardware systems that support the following: exercise control, field instrumentation, weapons engagement simulation, after action reviews, and live and constructive commanders training.

"We are pleased to continue SAIC's support of the Egyptian Armed Forces through the AFCTC No. 3," said Bev Seay, SAIC senior vice president and business unit general manager. "The AFCTC program is critical to preparing Egypt's warfighters for their critical missions, and we look forward to helping them maintain training readiness and enhance their realistic modeling and simulation capabilities."

PEO STRI provides interoperable training and testing solutions, and program management and life-cycle support for the Army's most advanced training systems.



## Defence Industry

### New Upgrades Enhance Sighting and Add More Firepower to LCT20 Turrets



Denel Land Systems has expanded the day and night fighting capabilities of its LCT20 turret's capabilities by integrating an advanced electro-optical sighting package for both the Commander and Gunner, this turret can be integrated into a wide range of armoured fighting vehicles.

Steve Matthews, the System Engineer on LCT 20 Turret says the upgraded LCT20-Neo significantly enhances the sighting system capabilities while retaining

the ruggedness and operator simplicity of the combat-proven LCT20 turret system.

DLS also offers an optional external Commander machine gun mount, fitted at the Commander hatch -- that is operated with the Commander standing out of the hatch -- providing additional fire power to the Co-axial machine gun fitted to the weapon cradle.

"No other changes are made to the LCT20 turret other than those required to fit the sighting systems and extra machine gun," says Steve Matthews. "No structural changes are made that affect the system safety or its reliability and the Direct Optical Gunner's sight can be retained as a back-up sight."

The sighting system upgrade consists of the following:

#### **COMMANDER SIGHT SYSTEM**

- - 3600 stabilised zoom-able electronic sight steered internally by the Commander and mounted to the turret roof.
- - Commander colour display user interface with the requisite mode selection controls on the screen.
- - Hand Controller.

#### **GUNNER SIGHT SYSTEM**

- - The Gunner sight consists of three integral elements and is mounted to the elevation cradle directly above the centre line of the main weapon barrel.
- - A user interface on the Gunner Colour Display Panel with the requisite mode selection controls on the screen and incorporating the ballistic tables for the main and co-axial weapons. These range tables are selectable by the Gunner.
- - The gunner sight consists of the Laser Range Finder, Thermal Imaging Sight and an electronic zoom-able day camera. These functions are all selectable from the Gunner Display Panel.

#### **METHOD OF OPERATION - SIGHT SYSTEM**

The sighting system is operated in the following manner:

- - The Commander acquires the target and designates electronically this position to the Gunner display panel.
- - The Gunner display shows an arrow, indicating either left or right, pointing to the direction the Gunner must slew the turret.
- - When the turret is within 10mils of the Commander-designated point, a mil scale opens. The Gunner can then refine the engagement as well as selecting which sight is being used - either TIS or day-camera -- and the weapon type with the relevant range tables.
- - The Gunner's sight picture is transmitted back to the Commander as a sub-window to enable the Commander to confirm the target engagement.
- - All other turret controls remain unchanged on the LCT20 turret.

production of its battle-proven 25mm M242 Bushmaster® and 30/40mm Mk44 Bushmaster® Automatic Cannon systems.

ATK will manufacture both the 25mm M242 and the 30/40mm Mk44 automatic cannons at its facility in Mesa, Ariz. Delivery is scheduled to begin in early 2012 and will be complete by late 2015.

ATK's family of medium caliber cannons are sold in more than 30 countries world-wide. They are the primary gun systems for the Bradley Fighting Vehicle, the Light Armored Vehicle, and the Apache Attack Helicopter. More than 11,000 25mm M242s are currently in service worldwide, and the 30/40mm Mk44 has become the weapon of choice for the world's medium caliber fighting platforms -- including ground combat vehicles, naval and aircraft applications.

"We are committed to providing the highest quality, most reliable medium caliber weapon systems to allied forces worldwide," said Dan Olson, Vice President and General Manager, ATK Integrated Weapon Systems. "These awards reinforce our focus on international growth, as well as our position as a market-leader in the development and manufacture of these systems."

#### **Exhibitions**

#### **Patria to showcase state-of-the-art Armoured Modular Vehicle and Innovative Intelligence Systems at DSEi in London**

Patria takes part in the international defence and security industry's event DSEi 2011 held in London on 13 - 16 September 2011. Patria's display is located in booth N6 360.

In the exhibition visitors will have the opportunity to see Patria's Armoured Modular Vehicle called Patria AMV which will be on display in Patria's booth. Also Patria's Advanced Real-Time Intelligence System ARIS is featured in the exhibition.

With over 1,300 exhibitors, DSEi is one of the most important events for the defence and security community showcasing the latest equipment and know-how of the industry. The annually held DSEi exhibition takes place in the ExCeL London, the international exhibition and conference centre.

#### **The unrivalled market leader Patria - the number of contracted AMVs exceeds 1400 pcs**

Patria is a leading supplier of modern armoured wheeled vehicles. Patria AMV combines high payload capacity with the latest technology. These features enable the simultaneous integration of a high level of protection and heavy weapon systems without compromising the mobility of the vehicle.

Patria AMV has been developed to provide optimal modularity of components and to be adaptable for a wide range of versions without changes in basic vehicle systems. Patria AMV is contracted among others by the

#### **Defence Industry**

#### **ATK Awarded \$12.6 Million in New Medium Caliber Cannon Orders**

MINNEAPOLIS -- ATK announced today a total of \$12.6 million in new medium caliber cannon contracts. These awards will expand the company's



Finnish, Polish and Swedish Defence Forces, and it has been fielded in ISAF operation since year 2007.

At the DSEi 2011 Patria is showcasing 2 versions of its highly successful Patria AMV

The "Nordic IFV -concept" Patria AMV 8x8 Armoured Wheeled Vehicle together with the KONGSBERG PROTECTOR Medium Calibre Remote Weapon Station (MCRWS) together with the KONGSBERG PROTECTOR M151 in a "Hunter-Killer" role. This concept vehicle is also featuring KONGSBERG VICS -system.

The Patria AMV 8x8 ARRV (Armoured Repair and Recovery Vehicle) is seeing its world premier at the DSEi2011. ARRV is equipped e.g. with a main winch which has pulling capacity up to 120 kN. The crane boom has a reach of 5 m, while max. lifting capacity with full boom and 56° angle is 4 t.

### High interest in electronic intelligence systems

Patria's ARIS, Advanced Real-Time Intelligence System, is a world class ELINT receiver. ARIS can detect, measure, record and visualize modern LPI radar waveforms in wide real time bandwidth with its sophisticated signal processing and innovative 3-D user interface. The user interface connects to the receiver via network and adapts to different bandwidth allowing Patria ARIS to be remote operable. Patria ARIS is a perfect choice for mobile or fixed ELINT stations and updating legacy systems.

The ARIS system is the latest Patria product to attract international attention. The first series deliveries of this system were agreed in the summer of 2010.

MoD's Light Protected Patrol Vehicle (LPPV) requirement last year, Supacat has subjected the SPV400 to over 10,000 km of reliability testing with over 70% conducted off-road, more than doubling the total trials distances undertaken during the LPPV assessment.

"The new production standard SPV400 is a significantly improved vehicle from the early prototypes. We have achieved new levels of reliability, handling and overall usability in the automotive design that surpass those required by LPPV", said Nick Ames, Managing Director, Supacat. "This is a vastly different vehicle from the one we had twelve months ago and we're proud of the progress we've made".

Supacat continued to develop the SPV400 light protected patrol vehicle to meet international demand for this new class of vehicle in military and non-military markets. The SPV400 is one of only two vehicles to succeed in meeting the UK Ministry of Defence's demanding requirements for its new Light Protected Patrol Vehicle (LPPV).



## Exhibitions

### Supacat unveils production standard SPV400 at DSEi



At DSEi 2011 Supacat is unveiling the production standard Supacat Protected Vehicle 400 (SPV400), which has achieved new levels of reliability and significantly improved ride and handling as a result of an intensive year long development programme.

The vehicle also features enhanced maintainability, a revised driver interface and new front end styling. The 7th vehicle at the latest configuration will be on show at stand N9-380.

Supacat has continued to rapidly develop the SPV400 to mature the design from the prototype testing phase to a production standard. Since being assessed for the UK

## Defence Industry

### General Dynamics UK selects Barco's rugged extreme displays for Specialist Vehicle program

Kortrijk, Belgium -- Visualization pioneer Barco is proud to announce that General Dynamics UK, the prime contractor for the British Army's Scout Specialist Vehicle (Scout SV), has selected Barco's 13" rugged extreme displays for the program, following a competitive bid.

SV is one of the British Army's most important vehicle programs for the next decade. Barco has developed the TX-335S, a 13" crew station display, especially for it. Based on Barco's existing offer of TX rugged extreme displays, the TX-335S provides operators with a visualization technology that is ideally suited to extremely demanding environments.

"Vehicle operators in the field deserve the best equipment available in order to do their jobs," comments Andy Powell, Supply Chain Manager, General Dynamics UK. "That's why we selected Barco's TX display family. These displays offer the British Army the reliability and durability it needs, in a future-proof package that will endure for the project's entire lifetime."

"We are very pleased to have signed this new contract with General Dynamics UK," comments Reggy Mortier, Barco's Director Key Account Management. "The results of our shared experiences with General Dynamics UK's engineering, program and commercial teams have now culminated in the TX-335S, which will offer the SV operators the best possible displays."

Available in sizes from 10" to 17", Barco's TX displays offer the latest proven technologies, such as low-reflection touch screen, NVIS capability, and sunlight readability. The TX's innovative and patented thermal management system makes the displays fit for the harshest temperature environments. The combination of low-risk, proven display technology and Barco's innovative display concepts makes the TX series the most trusted mission-critical displays for vehicle operations on the market.

The displays designed for General Dynamics UK can be seen at the DSEi trade show, from 13 - 16 September, at the ExCel London exhibition and conference center.

## Exhibitions

### KMW presents new DINGO version



Krauss-Maffei Wegmann (KMW), Europe's market leader for highly protected wheeled and tracked vehicles presented a newly developed and increased power-rated version of the DINGO 2 wheeled vehicle at the opening of the security exhibition DSEi in London today.

With already six nations (Germany, Belgium, the Czech Republic, Luxembourg, Norway and Austria) making use of the DINGO 2 in more than 15 versions, it has proven its worth in numerous international missions of the NATO, EU or United Nations. Especially in the Afghanistan missions, afflicted by terrorist attacks, the DINGO has repeatedly served as a life saver for its crew.

"KMW is known throughout the world for its powerful and highly protected military vehicles. With the new DINGO HD we are consequently continuing our product strategy, offering a product line with a broad variety of vehicles, all at the highest level of protection, to our international clients", said Frank Haun, CEO and President of KMW.

### INCREASED PERFORMANCE AND HIGHER PAYLOAD

The new HD-version (Heavy Duty) offers a much higher payload of up to 3 tons, whilst the external dimensions remain the same as all other DINGO 2

vehicles. The gross vehicle weight was increased to 14,5 tons. It is based on a Unimog vehicle chassis with a 225kW, 6-cylinder engine and a fully automatic transmission. Hereby a large number of new and mission-specific versions can be created, whilst maintaining the known international protection concept. The logistical concept of the DINGO 2 ties in perfectly with previously released DINGO versions. The user states can thereby guarantee a continuous and price efficient provisioning for the DINGO vehicle family.

### DINGO 2 – THE BEST PROTECTION FOR DANGEROUS MISSIONS

Almost 1000 DINGOs in different versions, ranging from patrol and reconnaissance versions over mobile command posts to ambulance and NBC-reconnaissance versions, are in use with six European nations. The high level of protection has repeatedly proven its worth during numerous terrorist attacks and has always saved the lives of the crew members. The vehicles offer the soldiers the best protection available in the world combined with high mobility. The large payload allows a battle load capacity for patrols of several days duration.

The deployment under extreme climatic conditions is guaranteed through climate control and a protective ventilation system. For self-defence purposes the DINGO is equipped with a remote controlled light weapons station of the type FLW 100 or FLW 200. the vehicle crew is thereby capable of operating the weapons station from within the protected interior. The stabilisation of the FLW allows gunfights even when the vehicle is in movement.

## Contracts

### ATK Expands Decade-Long Partnerships with Turkish Defence Company MKEK to Provide Training, Spares, Components and Technical Support

MINNEAPOLIS -- ATK announced today the receipt of a \$16.2 million, two-year contract from Makina ve Kimya Endustrisi Kurumu (Mechanical and Chemical Industry Corporation or MKEK), on behalf of the Turkish Ministry of Defence, for 25mm tactical and training ammunition components.

ATK established MKEK as a producer of medium caliber munitions through a transfer of technology and manufacturing assistance agreement in 1999. This new contract falls under a 10-year extension signed in December 2010 that follows an already decade-long partnership to provide material licensing and technical assistance for the indigenous production of ATK's 25mm munitions in Turkey. Since 1999, ATK has received more than \$40 million in orders from MKEK for training, equipment, technology transfers and 25mm components.

Materials for both tactical and training 25mm munitions, including the M792 HEI-T (High Explosive Incendiary with Tracer), M793 TP-T (Target Practice with Tracer), and M791 APDS-T (Armor Piercing



Discarding Sabot with Tracer) are scheduled for delivery to MKEK beginning in 2012.

ATK's suite of 25mm ammunition offers the accuracy and penetration capabilities necessary to effectively defeat today's threats: ballistically-matched training rounds enable improved warfighter performance, while tactical rounds offer superior lethality and fire suppression capabilities for engagement of both light armor and personnel targets at extended ranges.

"We are committed to driving international growth in our medium-caliber ammunition business through both direct sales and strategic partnerships," said Dan Olson, Vice President and General Manager, ATK Integrated Weapons Systems. "We will continue to support MKEK and their efforts to expand Turkey's indigenous production capabilities, and are excited to develop similar relationships within other key market areas."



## Contracts

### ST Engineering's Land Systems Arm Secures \$68m Contract to Supply New Generation Spider Light Strike Vehicles



Singapore -- ST Engineering today announced that its land systems arm, ST Kinetics, has won a contract worth S\$68m from the Singapore Ministry of Defence (MINDEF) through an international tender, to supply its new generation Spider Light Strike Vehicles (Spider LSV) and spares. Delivery is expected to take place over 2013-14.

Designed with a unique centre drive configuration allowing for weapon systems to be mounted on both sides of the driver, the Spider LSV incorporates a state-of-the-art electronic controlled engine, a 4-speed automatic transmission and an enhanced suspension system capable of high cross-country manoeuvrability. The Spider LSV has an increased seating capacity for a crew of six and is heli-portable.

"We are extremely pleased that MINDEF has selected the Spider LSV. This is an excellent testimony to ST Kinetics' continued focus to innovate through smart engineering, effective solutions to meet our customers' evolving operational needs." ~ SEW Chee Jhuen, President, ST Kinetics.

This contract is not expected to have any material impact on the consolidated net tangible assets per share and earnings per share of ST Engineering for the current financial year.



## Exhibitions

### Thales to supply electronic system integration for 257 armoured-wheeled vehicles

DSEI, London -- Thales has been awarded a major contract for the integration of an advanced open vehicle electronic architecture system for the 257 new 8x8 armoured-wheeled vehicles of the Malaysian Army. Thales acts as a subcontractor of DEFTECH (DRB-HICOM Defence Technologies Sdn Bhd), the local company selected by the Malaysian Ministry of Defence for the design, development and manufacturing of the vehicles.

This contract confirms Thales's position as a leading player in advanced vehicle system integration.

Today, combat vehicle platforms need to achieve greater efficiency on the battlefield and are becoming increasingly complex due to the need for integration of electronics equipment and network capabilities. Thanks to Thales's high-level expertise in C4ISR1 systems for land forces, the Group has been selected to provide an integrated and scalable vehicle electronic architecture system including a wide range of new-generation equipment (communications, electronics, sensors, command & control, mortar, optronics, etc.) to meet the rigorous operational performance criteria of the Malaysian Army.

In order to lead this programme in close cooperation with the customer, Thales relies on its local presence through Thales Malaysia Sdn Bhd and strengthens its local footprint thanks to its Malaysian joint-venture, Sapura Thales Electronics (STE), who will supply the complete HF and VHF radio communications system for the 257 vehicles.

Thales will integrate a state-of-the-art Open Information Communication System (OICS) - branded as VSys-net – a vehicle system electronics solution designed to optimise integration and enable information exchange (voice, data and video) both within vehicles and externally.

It combines a set of sub-systems and specific equipment that assist the commander during the mission (Battlefield Management System), manage the status of the vehicle components (Platform Management System), assist navigation, provide an optimised situational awareness and enhance survivability.

This solution will provide a consistent vehicle electronic architecture among the 12 variants (Infantry & Armoured Fighting Vehicles, Command, Anti-Tank, Recovery, Surveillance, etc.).

This will reduce integration risks on the overall program, speed up the operation, manage all platform systems in real time and enable optimised support services.

The Malaysian Army also renews its trust in Thales's field proven equipment such as the unique 120mm 2R2M Mortar for the mortar variant offering an unmatched range of 13km, as well as the SQUIRE ground surveillance radar as part of the surveillance variant.

"We are very proud of the renewed confidence in

Thales's solution expressed by the Malaysian Army. Thales strengthens its commitment to Malaysia and the local defence industry with know-how and technology transfer." explains Jean-Philippe Durieux, Country Director, Thales Malaysia. "Thales's excellence and expertise in complex systems integration make us a trusted partner, able to respond to the armed forces' ever growing needs."



## Defence Industry

### Oshkosh Defense Unveils Next-Generation Light Combat Vehicle



OSHKOSH, Wis. -- The next generation of light combat military vehicles require new levels of mobility and protection to operate effectively in remote, rugged and hostile landscapes. Oshkosh Defense, a division of Oshkosh Corporation, designed the Light Combat Tactical All-Terrain Vehicle (L-ATV) to meet the military's future needs based on 10 years of operational experience with the military utilizing Oshkosh's heavy, medium and MRAP vehicle fleets in Iraq and Afghanistan.

The affordable Oshkosh L-ATV incorporates field-proven technologies, advanced armor solutions and expeditionary levels of mobility to redefine safety and performance standards for the U.S. Armed Forces and international militaries. The L-ATV also is designed for future growth, with the ability to accept additional armor packages and technology upgrades as the mission requires.

"We designed the L-ATV to address the rapidly evolving threats and provide troops with greater ability to navigate through extreme driving conditions," said Ken Juergens, vice president and general manager of Joint Programs for Oshkosh Defense. "Battlefields have changed – threats are more dangerous, operating environments are more rugged and fuel efficiency is more important than ever. The state-of-the-art L-ATV is designed to meet these challenges, today and well into the future, just as our M-ATV continues to meet evolving battlefield threats without compromising its payload and off-road mission profile."

Equipped with the Oshkosh TAK-4i™ independent suspension system, the next generation of Oshkosh's TAK-4® suspension system, the L-ATV can safely navigate dangerous on- and off-road terrain while providing unmatched ride quality. The TAK-4i technology uses a proprietary technology to deliver 20 inches of independent wheel travel – 25 percent more

wheel travel than any vehicle in the U.S. military's fleets – and expands on the success of the TAK-4 system, which is currently fielded on more than 20,000 military-class vehicles.

The L-ATV's armored capsule is scalable and can accept multiple armor configurations to protect troops from IEDs and today's other prevalent battlefield threats. The capsule is optimized for protection, weight and mobility, and its modular and flexible design allows the vehicle to accept a greater range of upgrades and continuous enhancements.

The L-ATV's modern technology engine delivers expanded power capabilities, greater fuel efficiency and integrated communications for improved diagnostics and maintenance over legacy engine technologies currently fielded. An optional Oshkosh ProPulse® diesel-electric hybrid powertrain has been developed, integrated and tested in the L-ATV, providing a powertrain option that can be readily implemented to maximize the vehicle's efficiency through improved fuel economy, high levels of exportable power (stationary and on the move) and lower life-cycle costs.

As evidenced with the MRAP All-Terrain Vehicle (M-ATV) production, when the company ramped up to exceed 1,000 vehicle deliveries per month, Oshkosh has robust manufacturing capabilities, proven expertise and is ready now to build the L-ATV cost effectively on-time and in the quantities needed, with flexibility for future growth. Oshkosh's flexible production capabilities and remanufacturing experience allow the company to quickly incorporate production changes or retrofit vehicles with additional armor or upgrades.



## Exhibitions

### Plasan Ushers in New Era in Light Vehicle Protection against RPGs

Plasan - a global leader in the field of combat-proven survivability and armor solutions for vehicles, airborne platforms and personal protection - ushers in a new era in light-vehicle protection against RPGs with its introduction of FlexFence at DSEI, London, Stand N8-250.

The company will also showcase its range of solutions for vehicle and personal protection, based on its unique optimization of protection, payload, and cost.

Plasan's new FlexFence system, based on the company's most advanced and intelligent engineering, delivers the maximum protection at the lightest weight and at an affordable cost. Designed for light vehicles, the system is easily mounted on existing vehicle hulls - and easily removed, with no design changes required. Combining exceptional ballistic protection with maximal functionality, FlexFence provides an unparalleled level of protection against one of today's most serious threats - Rocket Propelled Grenades (RPG). Optimized materials together with cutting-edge design enable unmatched durability. Plasan's fine-tuned engineering ensures that the integrity of the platform's performance - as well as

the armored protection - are never compromised. FlexFence causes no standoff from the vehicle's hull, maintaining the platform's silhouette, thus preventing the creation of improvised storage spaces that can interfere with system performance.

According to Dani Ziv, Plasan's CEO, "We are very pleased to unveil FlexFence at DSEi. The system represents a significant milestone in the quest for an effective defense for light vehicles against the scourge of RPGs. This new technology, based on the most cutting-edge materials, methods and engineering processes, safeguards the lives of soldiers on the battlefield by providing protection levels substantially beyond current standards - while adding the smallest possible weight to the vehicle."

### Training And Simulators

## Lockheed Martin Awarded \$28.6 Million Contract to Upgrade U.S. Army Advanced Gunnery Training Systems



Orlando, FL -- ORLANDO, Fla., September 14, 2011 -- The U.S. Army Program Executive Office of Simulation, Training and Instrumentation (PEO STRI) has awarded Lockheed Martin a \$28.6 million contract to upgrade more than 60 Advanced Gunnery Training Systems (AGTS) for M1A1 and M1A2 main battle tanks.

The company will also provide 11 new M1A2 training systems as a part of the two-year effort.

The AGTS is a simulator designed to train individuals, crews, platoons and companies in precision gunnery skills, enabling trainees to transition quickly to live fire or combat gunnery. As part of the upgrade effort, Lockheed Martin will integrate the newest version of its Scalable Advanced Graphics Engine (SAGE) image generation technology, which draws from extensive visual databases to help warfighters experience a more detailed environment and encounter more realistic targets.

"These upgrades will help keep warfighters prepared for a dynamic operational environment," said Jim Craig, vice president of training systems in Lockheed Martin's Global Training and Logistics business. "Through the AGTS and our SAGE image generation software, they get a training experience that is unmatched - except in real life."

Additional upgrades include new graphic user interfaces, such as more pull-down menus for the instructor screens, making it even easier for instructors to monitor and control the training scenarios. Since

Lockheed Martin developed the original AGTS architecture more than 15 years ago, the company has delivered over 200 AGTS systems and upgrades to U.S. Department of Defense customers with an additional 180 to foreign partner nations.

Headquartered in Bethesda, Md., Lockheed Martin is a global security company that employs about 126,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The Corporation's 2010 sales from continuing operations were \$45.8 billion.

### Robots

## SELEX Galileo unveils ACME remotely operated vehicle system at DSEi 2011

DSEi, London -- SELEX Galileo, a Finmeccanica company, is pleased to announce the launch of ACME (Automated Computerised Mobility Equipment), a kit that can be installed on any land vehicle to transform it into a remotely operated vehicle.

ACME is SELEX Galileo's answer to the pressing requirement for route clearance solutions and convoy protection from asymmetric threats, with the objective being to reduce the risk to military personnel in high IED threat environments. ACME forms the core of a fully remote-operated situational awareness vehicle which integrates the capabilities of the ACME system with advanced sensor and self-protection technology.

The strength of ACME lies in the fact that the vehicle does not need to be modified to use the system, meaning that ACME can be installed in under 2 hours, in some cases in as quickly as 40 minutes. The system increases the force protection level and allows Commanders to reduce the risk to personnel involved in patrol, transport or route clearance missions. On route clearance operations in particular, the ACME system facilitates operational functions such as detection and investigation/confirmation without military personnel being required to actually be on-board vehicles, instead controlling them remotely.

The system can be integrated with a wide range of SELEX Galileo's sensor technologies including 360 degree thermal imaging and narrow-field-of-view systems and can be supported with sensor data analysis. Additionally, SELEX Galileo's vehicle simulation capabilities naturally complement the ACME system.

ACME is part of SELEX Galileo's force protection offering, giving the war fighter an unfair advantage.

SELEX Galileo equipment that can be integrated with the ACME system includes:

- Janus electro-optical solution for medium and long-range day and night surveillance.
- Driver Night Vision System (DNVS) dual channel driver's night vision system, designed to enhance the operability of an armoured fighting vehicle.
- Mini Colibri, an indirect view electro-optical fire control system.



Hi-Tec Milano is responsible for the remote control guidance system which comprises actuators, navigation aids, processing and software elements.



## Contracts

### SELEX Galileo wins EUR 4.3M contract to provide Thermal Sight Systems for Royal Thai Army Scorpions

DSEi, London -- SELEX Galileo, a Finmeccanica company, has been awarded a contract by Update Development Ltd worth around EUR 4.3M (J3.8M) to provide Thermal Sight Systems (TSS) to the Royal Thai Army in support of their Scorpion Light Tank upgrade programme.

The contract, for an initial quantity of 42 TSS systems, will see SELEX Galileo provide the battle-proven Surveillance, Target Acquisition and Weapon Sight (STAWS) fully integrated with assisted-aiming fire control software which will provide the Scorpion with a modern direct fire capability, 24 hours a day under all battlefield conditions.

The contract follows in-country trials of the system with the Royal Thai Army and deliveries will commence in February 2012 with the systems expected to go into service mid 2012. Colin Horner, Head of Campaigns Land ISTAR & Imagers at SELEX Galileo said: "We are delighted that our proposal has been accepted by the Royal Thai Army and look forward to equipping the Scorpion Light Tank with this outstanding capability. The TSS is a cost effective upgrade to legacy vehicles such as the Scorpion and can provide extended direct fire capability to artillery platforms such as 155mm Howitzers."

"The Surveillance and Target Acquisition Sight (STAWS) which provides the multi-waveband imaging solution is in service with the British Army and other coalition forces on remote weapon stations and other ISTAR assets and is well suited to the Scorpion Light Tank," added Colin Horner.

The contract is for the first tranche of a three stage upgrade programme with the Royal Thai Army intending to upgrade a number of further vehicles. Successfully winning this contract puts SELEX Galileo in good stead to compete to supply the TSS for further Scorpion Light Tanks.

The complete TSS system comprises the STAWS, a commander's display and a gunner's display. Integrated assisted-aiming software can use the laser-sighting capability of the STAWS to automatically elevate the tank's turret to the correct level based on the range of the target and the ammunition type being used.



On the second day of the exhibition "RussianExpoArms-2011" which was dedicated to the 75-th anniversary of UVZ this year, Prime Minister of the Russian Federation Vladimir Putin visited Nizhny Tagil.



During the visit Mr. Putin examined the modernized tank T-90C, launched a new production line in a wheel set manufacturing shop of URALVAGONZAVOD. He also made a speech at the festival "Nizhny Tagil – city of the young".

Right on arrival at the test site of Staratel Mr. Putin visited the demonstration area where the modernized tank T-90C, the most advanced model created by designers of URALVAGONZAVOD, was exhibited. The new tank surpasses its predecessors in all the characteristics defining combat effectiveness: target effects, a high level of protection from the majority of armour-defeating weapons, reliable life-support, survival and mobility systems. The advantages of the modernized tank were reported to the Prime Minister by acting design manager of OJSC "Ural Design Office of Transport Mechanical Engineering" Andrei Terlikov. Among the reported advantages Mr. Terlikov particularly mentioned the increased range capability of up to 5 kilometres. Mr. Putin agreed that it is a very important component, the component which the Ministry of Defence has always been extremely demanding to. In order to illustrate the advantages a comparison of performance characteristics of the Russian tank and its foreign analogues was demonstrated to the Prime Minister.

The demonstrated tank interested the chairman of the Russian government so much that Mr. Vladimir Putin took off his jacket, climbed into the turret and took the commander's seat. Thus, he personally experienced the convenience of the modernized control system. In his speech which he made later in front of the guests of "RussianExpoArms-2011" the Prime Minister underlined that the modernized tank T-90C was one of the most interesting objects at the exhibition and he also noted that the support of the government provided to the enterprise in Nizhny Tagil during the crisis period was not for nothing.

After visiting the exhibition Mr. Putin moved on to URALVAGONZAVOD. He visited the wheel set shop, modernization of which had been recently completed. Modernization of the wheel set shop is part of a large-scale renovation of the enterprise which is currently underway. At the shop the chairman of the Russian government launched a new automatic production line with the annual capacity of forty-five

## Exhibitions

### Vladimir Putin congratulated URALVAGONZAVOD on 75-th anniversary

thousand axels for wheel sets and put his signature on the diagramme of the first wheel set which is a kind of a production unit passport. "In connection with the launch of this production line we need to think over the changes of the existing technical regulations which guide wheel set production", Mr. Putin said addressing Vice Prime Minister Sergei Ivanov. In response to the instruction deputy chairman of the government said that such changes have long been necessary and that he is ready to prepare the necessary documents.

Mr. Putin closed his visit to Nizhny Tagil at the festival "Nizhny Tagil – city of the young", which was a holiday presented by the management of the corporation to people living in Nizhny Tagil to celebrate the 75-th anniversary. While making his speech the Prime Minister reminded everybody that during the years of Great Patriotic war every third tank was made by URALVAGONZAVOD and, hence, inhabitants of the city should be proud of their enterprise. "Today we have discussed the development programme for URALVAGONZAVOD, - he said, - We are planning to allocate more than sixty-four billion rubles for implementation of the programme in the coming years."

"URALVAGONZAVOD is still one of the most significant elements of industry and the whole Ural region is an arsenal and industrial centre of Russia," - these were the words which Mr. Putin winded up his speech with.



## Defence Industry

### BAE Systems Delivers Tougher Recce Vehicles for Afghan Ops



TELFORD, United Kingdom -- BAE Systems has delivered improved versions of the Scimitar recce vehicle family with tougher new hulls and a range of other upgrades. The first vehicles are now providing improved crew protection for British Army crews in Afghanistan.

Five variants of the CVR(T) (Combat Vehicle Reconnaissance –Tracked) family are being upgraded to the Mk 2 standard as part of this fast-moving and cost-effective Urgent Operational Requirement (UOR) programme. In addition to the Scimitar Mk 2 reconnaissance vehicle, the supporting Spartan troop carrier, Samson repair & recovery, Sultan command post and Samaritan ambulance are being re-hulled at a total cost of less than J30m.

The new Telford design, based on the Spartan hull, is fabricated from aluminium at BAE Systems' Wolverhampton site and incorporates a range of design changes to improve mine blast protection, improve vehicle maintainability and reduce support costs while minimising weight growth.

A major safety feature is the improved driver egress.

"In addition to the change in material, the new hull for the Scimitar Mk 2 is based on the Spartan variant," explains project manager Pete Hallows. "This change gives vital extra headroom within the driver's area to fit a blast attenuation seat, while providing an additional escape route through the new rear door.

Hallows adds: "The modern alloy also enhances corrosion resistance, which means reduced maintenance and therefore reduced through-life costs."

News of the upgrade follows a programme announced in June called Warrior Theatre Entry Standard (HERRICK), also known as TES(H), which has similarly boosted protection and mobility on Warrior infantry fighting vehicles in Afghanistan. Engineers on the two programmes shared feedback from the front line and testing to optimise design solutions in areas such as protection, suspension and seating.

The Mk 2 follows earlier upgrades which gave CVR(T) a new engine, add-on armour and better engine cooling and air filtration to cope with operation in hot, dusty climates.

More than two thousand CVR(T)s are in service with non-UK customers and BAE Systems is marketing the CVR(T) Mk 2 and earlier upgrade technology to them.

#### **CVR(T) Mk 2 changes include:**

- new mine-blast protection seating in every position in every variant
- redesigned and repositioned driver foot controls to reduce lower limb mine blast injuries
- improved appliqué armour to improve blast and ballistic protection
- upgraded torsion-bar suspension to improve vehicle mobility
- revamped fuel system and tanks
- a heavier-duty winch on the Samson variant, and many other minor changes.

A new power distribution system, including a new rotary base junction, provides improved power management between chassis and turret and will enable further systems upgrades in the future. An ongoing non-UOR brake upgrade programme will result in a retrofit to the vehicles next year.

Contract award for CVR(T) Mk 2 was in December 2010, following an earlier risk mitigation programme. The upgrade was developed, tested and managed by the Vehicles Military & Technical Services team at BAE Systems' Telford site. The team also co-ordinated vehicle build at the nearby DSG (Defence Support Group), Donnington facility. All 50 vehicles will be delivered by early 2012.

UK sub-contractors on the programme include Jankel (Weybridge, Surrey), Allen Vanguard (Tewksbury), MTL (Sheffield), ACGB (Kettering), Tinsley Bridge (Sheffield), Horstman (Bath), Moog (Reading), Friction Hydraulics (Telford), W A Lewis (Shrewsbury), Park Precision (Weymouth, Dorset), ABEC (Birmingham), Permali (Gloucester) Park Sheet Metal (Coventry), AB Connectors (Mountain Ash, Wales) and Thales (Glasgow).



**Future Technologies****Systems for Approximately \$40 Million****Textron Offers TRAPS for TARDEC's Active Protection Program**

Wilmington, MA -- Textron Defense Systems, an operating unit of Textron Systems, a Textron Inc. company, announced today that it has submitted a three-year proposal to the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) for the Rocket-Propelled Grenade (RPG) Active Protection, or RAP, program.

Teamed with BRTRC of Fairfax, Va., prime contractor on TARDEC's omnibus contracting vehicle, Textron Defense Systems' offering is based on the company's highly mature Tactical RPG Airbag Protection System (TRAPS). TRAPS is an active vehicle protection system incorporating Textron Defense Systems' sensors, which are configured to identify incoming RPGs. Once the sensors confirm an RPG threat, a TRAPS countermeasure is deployed to defeat the RPG and prevent vehicle penetration. Lightweight and constructed of commercial, off-the-shelf components, TRAPS is integrated easily onto any ground vehicle, wheeled or tracked, within the vehicle's existing profile.

The RAP program consists of three, 12-month phases. Phase I is intended to span October 2011 through September 2012, and to consist of design work leading to a TARDEC technology readiness level, or TRL, 4 assessment.

"Our TRAPS system showcased its maturity during a six-week test event by the Office of the Secretary of Defense in 2010, including live RPG threats against both stationary and moving vehicles from several angles and ranges," says Textron Defense Systems Vice President of Intelligence, Surveillance and Reconnaissance and Protection Systems Thomas McNamara. "We also recently completed successful testing of our TRAPSNet passive variant with the Defense Advanced Research Projects Agency. In both cases, TRAPS exhibited exceptional performance, as well as the flexibility to provide that level of protection to any vehicle -- making it the mature, low-risk solution for TARDEC's requirements."

**Defence Industry****Elbit Systems to Supply the Israeli Ministry of Defense with Cardom**

Haifa, Israel -- Elbit Systems Ltd. ("Elbit Systems"), announced today that it was awarded a contract by the Israeli Ministry of Defense (IMOD) in the amount of approximately \$40 million to supply Cardom systems to the Israeli Defense Forces (IDF).

Manufactured by Elbit Systems' subsidiary Soltam Systems Ltd., Cardom systems were initially supplied to the IDF in 2007 and are considered among the most advanced of their kind in the world. The systems are to be supplied over a period of four years.

The Cardom systems integrate a 120mm mortar with innovative fire control, navigation, automatic aiming and propulsion systems.

The Cardom mortars are operational by various IDF infantry units, as well as various armies around the world, including the U.S. Army.

**Contracts****German Army orders 31 MUNGO 2 Multi-purpose vehicles**

Krauss-Maffei Wegmann (KMW), Europe's market leader for highly protected wheeled and tracked vehicles, has received an order from the German Army for the assembly and delivery of 31 further MUNGO 2 Multi-purpose vehicles for the Special Operations Division (DSO).

The first three pre-series prototypes were delivered and qualified technically and tactically in an operational test. The delivery of another 31 vehicles will be completed until 2013.

**Air-portable and multi-faceted deployment**

As all other vehicles of the MUNGO family of air-portable vehicles, with its small size and low overall weight the MUNGO 2 Multi-purpose was specifically developed for transportation on a CH-53 transport helicopter. With its universal hydraulics and transport



system this multi-purpose version is particularly suitable for the mission-specific transport of munitions, fuel, maintenance and NBC- decontamination equipment. A quick-change system for front mounting implements additionally enables the deployment of engineering systems. With a payload of up to 1.5 tons the MUNGO 2 Multi-purpose can additionally transport supply or armament in trailer operations.

### Specifically improved for military missions

Tailored specifically to the requirements of highly-mobile air-portable forces and built on the system criteria of the MUNGO-family, the MUNGO 2 Multi-purpose additionally convinces through a chassis optimized in continuous improvement for special missions, for example in Afghanistan. In addition, the vehicle is perfectly protected against ballistic, mine and IED threats. Fully armoured and separated from the chassis, the floor provides along with a safety cell maximum protection for the two-headed crew.

Until now KMW has delivered more than 400 MUNGO in the three different versions – troop transporters, multi-purpose vehicles and large space cabins – to the German Army.



the protection of a field camp using such a laser weapon.

The experts at MBDA Germany have now proven that their laser demonstrator is already able to deliver high laser power and a high quality laser beam at a moving target over long distances. Currently, it is only possible with the geometric coupling principle that has been patented by MBDA Germany. This therefore lays the groundwork for the development of a C- RAM laser weapon system.

A European consortium led by MBDA Germany has been developing the major aspects of the system in a study being conducted on behalf of the European Defence Agency (EDA) since 2009. Integration investigations with appropriate hardware have also been carried out. The final selection of a platform for the laser weapon system will be made once all the relevant conditions have been established. This process is currently underway in close consultation with users and suppliers.

The successful tests by MBDA Germany have been conducted on behalf of the German Federal Office for Defence Technology and Procurement (BWB) at the latter's WTD 52 testing site.



## Future Technologies

### MBDA Germany prepares the way for C-RAM laser weapon system

The ability to direct 10 kW laser power over a long distance and reach a target with a high quality beam is a decisive forward step. MBDA Germany has conducted several successful tests with its laser demonstrator. This is evidence of major progress in terms of achieving a C-RAM (Counter Rocket, Artillery, Mortar) laser weapon system. The results also confirm MBDA Germany's leading position in Europe in this domain.

For the first time, 10 kW laser power reached a moving target located more than two kilometres away while retaining a high quality beam. The tracking of dynamic objects and the effects on the object were demonstrated over a distance of more than 2,300 m and an altitude differential of 1,000 m under real-life environmental conditions.

These results are of major significance. The successful combating of RAM munitions is of major importance for the protection of soldiers in the field. However, this also represents several technical challenges. Defence against RAM munitions is only possible to a limited extent with current cannon systems or missiles. These difficulties arise from the high speed of artillery munitions, the small signatures of mortar munitions, the required combat distance in excess of 1,000 m and the necessary combat velocity. In this respect, laser weapons are exceptionally well suited for use against RAM munitions.

However, since countermeasures against RAM must be carried out within a few seconds, it is necessary to achieve high laser power and a high quality laser beam against a fast moving target at distances of between 1,000 m and 3,000 m. This is the only way to guarantee

## Defence Industry

### Oshkosh Defense Debuts Heavy Recovery Technology Demonstrator



OSHKOSH, Wis. -- Heavier vehicles and more powerful improvised explosive devices (IED) are placing new mobility and protection demands on the U.S. Armed Forces' recovery vehicle fleet. To address these challenges, Oshkosh Defense, a division of Oshkosh Corporation, will unveil the latest in heavy recovery technology at Modern Day Marine 2011 Sept. 27-29 in Quantico, Va.

Oshkosh Defense developed the Heavy Recovery System (HRS) technology demonstrator based on the battle-proven Logistics Vehicle Replacement System (LVSR) platform and cutting-edge wrecker technology from Jerr-Dan, an Oshkosh Corporation company.

"The Oshkosh HRS offers the military unsurpassed recovery abilities from a single vehicle," said Mike Ivy, vice president and general manager of Army Programs for Oshkosh Defense. "Oshkosh independently developed a highly-protected and mobile platform and worked with our sister company, Jerr-Dan, to integrate top commercial wrecker capabilities. We built this mobile platform to lift and retrieve the heavier armored, IED-damaged vehicles, and most importantly, it integrates the levels of troop protection required in

current conflicts."

With a Jerr-Dan 50-ton rotating boom, dual 50,000 lb boom winches, and dual 40,000 lb constant pull drag winches, the HRS can retrieve both Class I and Class II MRAPs, and even the largest military wheeled vehicles. The system can rescue overturned vehicles and drag severely damaged vehicles to the recovery vehicle for hook-up and return to base. The HRS offers spading, along with the ability to operate all four winches simultaneously to enable vehicle recovery in a mire or ravine. Four-axle steering capability delivers a tight turning radius, and superior mobility is delivered through the use of Oshkosh's TAK-4® independent suspension system across all five axles.

These capabilities are delivered on the battle-tested LVSR platform, used by the U.S. Marine Corps for the transportation of heavy payloads, such as munitions, fuel, water and heavy equipment. The HRS features a proven underbody blast protection for improved crew survivability. The system also has the ability to accept add-on armor kits to increase protection for troops in high-tempo operations across expansive and varied terrain.

At Modern Day Marine, Oshkosh Defense will also display a full range of cutting-edge vehicle platforms and technologies to serve the U.S. Marine Corps – light through heavy. Oshkosh will be exhibiting at booth #2404 at the Marine Corps Base in Quantico.

OSHKOSH, Wis. -- Oshkosh Defense, a division of Oshkosh Corporation, will showcase a range of cutting edge vehicle platforms and technologies to serve the U.S. Marine Corps in its exhibit at Modern Day Marine 2011 in Quantico, Va.



The Oshkosh Light Combat Tactical Vehicle (LCTV) will be on display at the show. Designed to demonstrate the future of light tactical vehicle technologies – including improved off-road mobility and exportable power capabilities – the LCTV has been independently developed and tested by Oshkosh Defense. The vehicle completed the Tecate SCORE Baja 1000 off-road race in the Mexican desert in 2010. Lessons learned during the race and feedback from the field have advanced the development of technologies available to the Marine Corps today, including Oshkosh offerings for upgrading the HMMWV fleet.

"Oshkosh Defense has developed industry-leading mobility and protection solutions for the Marine Corps' heavy and medium fleets for years, and we are expanding our efforts with extensive R&D work to bring the light fleets up to a new level of performance," said John Bryant, vice president and general manager of Marine Corps Programs for Oshkosh Defense. "We've developed an upgraded HMMWV using our battle-tested TAK-4® independent suspension system to give Marines improved mobility, survivability and ride quality."

Oshkosh also will exhibit its innovations with exportable power solutions to meet the increasing energy demands of modern military equipment, in accordance with the DoD Operational Energy Strategy. A Medium Tactical Vehicle Replacement (MTVR) with On-Board Vehicle Power (OBVP), which can export up to 120 kW of military-grade power and reduce the need for generators, will also be on display. The MTVR with OBVP can deliver enough energy to power a command center, city block or small airport, and is currently in testing with Marines.

## Contracts

### Force Protection Receives \$16.9 Million Award for Fuel Tank Protection Kits

Force Protection Industries, Inc., a Force Protection, Inc. group company, today announced that it has received a firm fixed price modification to existing contract M67854-07-C-5031 from U.S. Marine Corps Systems Command with a total value of approximately \$16.9 million.

The award is for 961 fuel tank protection modernization kits and certain tools for the Marine's Cougar Mine Resistant Ambush Protected vehicles. Work will be performed in Charleston, S.C., and is expected to be completed no later than March 30, 2012.

The Company previously announced on May 2, 2011, an order for 1,130 fuel tank kits with an approximate value of \$18.8 million.

Phil Ciarlo, Chief of Operations for Force Protection, said, "This additional fuel tank protection kit order continues the important modernization work for the installed Cougar fleet and ensures that additional vehicles will receive the best available protection for their fuel systems."

## Future Technologies

### Future of Military Vehicle Capabilities from Oshkosh Defense on Display at Modern Day Marine

## Exhibitions

### Ceradyne Debuts HMMWV RECAP Candidate at Modern Day Marine

Costa Mesa, Calif. -- Ceradyne, Inc. announced the completion of an advanced technology HMMWV (High Mobility Multipurpose Wheeled Vehicle) RECAP prototype that has been completed by Ceradyne Vehicle Armor Systems and Gravikor in a team effort to incorporate a spaceframe design.

Ceradyne Vehicle Armor Systems, in conjunction with their Team Partner Gravikor will be displaying a

technologically advanced version of a HMMWV RECAP candidate at the Modern Day Marine Exhibition in Quantico, VA. on September 27-29, 2011. The prototype incorporates an advanced spaceframe design for a vehicle crew cab providing the versatility to scale the armor application to the mission.



Capable of going from traditional canvas doors to a full "Frag Kit" protection level, this solution also incorporates a blast shield of advanced materials under the crew cab. The combination allows the Marine Corps to recapture the full weight savings needed to insure expeditionary amphibious operations and long term storage aboard ships.

Marc King, President of Ceradyne Armor Systems, explains: "This is the only solution currently available for evaluation that accommodates the concept of "scalable armor" allowing the end user to match the crew protection level with the mission. If no armor or just a light armor application is needed, the spaceframe technology provided on the HMMWV chassis will accommodate it. If the battle field threat is more lethal, the crew can increase the level of protection by changing the armor solution applied to the frame. As better, lighter, more cost effective armors are developed in the future; they can be accommodated as well."



## Future Technologies

### Applications of IBD NANOTech Solutions



The huge demand for the IBD NANOTech products during the DSEi 2011 in London underlines the great need for high level but light weight protection solutions for armored vehicles, aircrafts and other applications.

The full spectrum of products based on nano-technologies developed and introduced by IBD allows the design of outstanding high level survivability systems with unmatched low weight. These products comprise ceramics, steel and composite materials, all of

them showing greatly improved ballistic performance over an extended temperature range.

The visitors were shown various applications of these technologies. Since 2010 IBD was able to qualify solutions on a wide range of platforms, ranging from light 4x4 vehicles over medium 8x8 APCs and tracked IFVs up to the Leopard 2 A4 main battle tank. All vehicles can be equipped with a mine and IED protection at a level that was not achievable before.

IBD succeeded in the development of processes allowing to reduce the production costs so that the new technologies and solutions can be offered at competitive prices giving the customers a combined benefit in terms of:

- Higher protection
- Lower weight
- Higher mobility
- Higher payload
- Lower life cycle costs



## Contracts

### General Dynamics Awarded \$9 Million by U.S. Army for Modular Artillery Charge System



CHARLOTTE, N.C. -- General Dynamics Armament and Technical Products was awarded an \$8.6 million contract option by the U.S. Army for the load, assemble and pack of the M231 and M232A1 Modular Artillery Charge System (MACS).

### General Dynamics Awarded \$9 Million by U.S. Army for Modular Artillery Charge System

General Dynamics Armament and Technical Products is a business unit of General Dynamics.

The option modifies an existing contract awarded in December 2008. The MACS provides propelling charges with combustible cartridge cases for 155mm artillery. The charges are compatible with new and existing howitzer systems and offer enhanced precision with a reduction in weight and volume.

Production work will be performed at General Dynamics' facility in Camden, Ark., which has approximately 300 employees. Program support will occur at the company's Williston, Vt., facility, which has a workforce of approximately 400 employees. Work will be completed by September 2013.

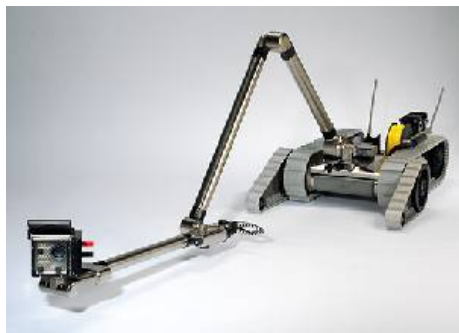


"MACS offers maximum flexibility in tactical logistics to U.S. warfighters," said Steve Elgin, vice president and general manager of armament systems for General Dynamics Armament and Technical Products. "The build-a-charge system eliminates the need to dispose of unused cartridges, and the charge system fires cleanly, without leaving residue in the cannon breech."



## Robots

### iRobot Receives \$60 Million Army Contract



BEDFORD, Mass. -- iRobot Corp., a leader in delivering robotic technology-based solutions, has received a five-year \$60 million indefinite delivery/indefinite quantity contract from the U.S. Army's Robotic Systems Joint Program Office (RSJPO).

The U.S. Army Contracting Command in Warren, Michigan is the contracting entity.

Under the contract's terms, the Army can procure iRobot PackBot robots, spare parts, repairs, upgrades and support services for U.S. military requirements, including Foreign Military Sales (FMS). iRobot has delivered its combat-proven government and industrial robots to customers in approximately 30 countries.

"iRobot's sales to international customers, directly and through FMS contracts, continue to grow. We see great potential for continued growth, as existing customers use robots in a wider variety of missions and potential customers become aware of their life-saving benefits," said Robert Moses, president of iRobot's Government and Industrial Robots division. "iRobot is pleased to have this contract vehicle in place, which will allow the Army to purchase additional robots and deliver them to our soldiers, allies and coalition partners across the globe."

iRobot has delivered more than 4,000 robots to warfighters and first responders worldwide to perform bomb disposal, reconnaissance and other dangerous missions.

