

# Army Guide monthly



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## Future Technologies

**General Dynamics UK Selects Green Hills Software for British Army's Specialist Vehicle Programme**

NUREMBERG, GERMANY -- Green Hills Software, the largest independent vendor of embedded software solutions, has announced that its INTEGRITY® real-time operating system (RTOS) has been chosen by General Dynamics UK as the operating system software for all the mission-critical computers of the Scout Specialist Vehicles (SV) programme, which General Dynamics UK is developing during the demonstration phase of the programme.

Green Hills Software's MULTI® integrated development environment (IDE) has also been selected to build the application code that runs on top of the INTEGRITY operating system on all the computer subsystems in the vehicle.

Scout SV is a new generation military armored vehicle family that comprises several variants built on a common base platform. Initial variants include the Scout reconnaissance vehicle, Recce Armored Personnel Carrier, repair vehicle, and recovery vehicle. All will share an open electronic architecture, making the Scout SV fleet easier to maintain, simplifying user training and playing a key role in lowering costs throughout the planned 30-year life of the vehicles.

The four main electronic subsystems on Scout SV will use Intel Core i5 and Core i7 multicore architectures running Green Hills Software's INTEGRITY RTOS and each has its own display. These are used by the driver, commander and gunner; and there is one additional terminal. The subsystems support all critical services including driving controls, defensive aids, navigation tools, 'friend or foe' recognition and visual displays. The latter can receive live feeds from up to seven video cameras and real-time performance is essential in order to avoid motion sickness that can result from inconsistencies between visually and physically perceived information.

Christopher Smith, vice president of marketing, Green Hills Software, said, "INTEGRITY is field-proven in the most demanding military and avionics applications on land, sea and air. We are very pleased to be involved in the SV program, which will afford the highest level of protection and support to British soldiers and, potentially, to those of other allied forces around the world."

The demonstration phase of the project will see the development of seven prototypes for the Scout reconnaissance vehicle and supporting variants.



## Defence Industry

**Hendrickson and AxleTech International Awarded Contract by Navistar Defense for 2,717 MaxxPro Suspension Systems**

WOODRIDGE, Ill., and TROY, Mich. -- Hendrickson, a Boler Company, and AxleTech International, a General Dynamics company, were recently awarded a contract from Navistar Defense, LLC, to equip 2,717 International® MaxxPro® Long Wheel Base (LWB) Mine Resistant Ambush Protected (MRAP) vehicles with independent suspension systems.

This order continues the team's work to enhance the capability of the entire MaxxPro fleet, which recently included procurement of new MaxxPro Dash vehicles and the MaxxPro Dash ambulance variant.

Hendrickson's integrated independent suspension system for the MaxxPro LWB MRAP program incorporates Hendrickson's advanced engineered sub-frames, sway -bars, coil springs and shocks with AxleTech's 5000 Series Independent Suspension Axle System (ISAS®). This state-of-the-art system delivers improved mobility in rough terrain, better control and greater wheel travel to improve driver efficiency at higher off-road speeds. As the Tier 1 supplier, Hendrickson will supply the completed suspension systems to Navistar for installation on the MRAP vehicles, which will ultimately be delivered to the U.S. Army.

Production work for the MaxxPro upgrades is conducted at Hendrickson's Kendallville, Ind., facility, which has a workforce of approximately 215 employees, and AxleTech's Oshkosh, Wis., facility, which has a workforce of approximately 200 employees. Deliveries began in January 2012 and will be completed in October 2013.

Doug Sanford, the vice president and general manager of Hendrickson's Truck Suspension Systems stated, "Hendrickson and Navistar Defense's long-standing and strong cooperative relationship has once again produced a highly-engineered, advanced vehicle capable of protecting our military and allowing them to perform and excel in harsh environments. We have teamed with AxleTech to supply highly

engineered and technologically advanced components for the MaxxPro program. Our leading-edge independent suspension design and vehicle integration expertise, coupled with Navistar Defense's strength in developing durable, rugged military vehicles, has produced a revolutionary MRAP vehicle platform."

"The AxleTech / Hendrickson system will modernize and standardize the suspension system of the Army's MaxxPro fleet," said Gerry Giudici, vice president and general manager of AxleTech International. "In partnership with Hendrickson, we are delivering a world-class product that enhances the vehicle's mobility, ride control, handling and safety."

## Robots

### iRobot receives military order for FirstLook robots



iRobot Corp., a leader in delivering robotic technology-based solutions, received a \$1.5 million order, funded by the Joint Improvised Explosive Device Defeat Organization (JIEDDO), for more than 100 of the company's model 110 FirstLook™ robots.

Since its introduction last year, the iRobot 110 FirstLook has undergone extensive testing and demonstrations with the customer. All robots under this order have been delivered and will take part in an operational assessment this spring.

FirstLook is a small, light and throwable robot. It is ideal for a wide range of infantry and special operations missions, including building clearing, raids and other close-in scenarios. With four built-in cameras, FirstLook provides multi-direction situational awareness while keeping the operator out of harm's way.

FirstLook possesses a unique set of capabilities. While it weighs just five pounds, it is robust enough to survive 15-foot drops, overcomes obstacles as high as seven inches and automatically self-rights when flipped over. Future capabilities include two-way audio communication and digital mesh networking, which will allow multiple robots to relay radio communications over greater distances.

"iRobot has received very positive feedback from the field about FirstLook's capabilities, and we are excited about the advantages this game-changing robot will provide to our troops," said Tim Trainer, interim general manager of iRobot's Military Robots business unit. "Similar to how iRobot's PackBot and SUGV robots changed the way explosive ordnance disposal missions are conducted, we feel FirstLook will change how infantry and special operations missions are performed in the years ahead."

## Defence Industry

### Navistar Defense Receives MRAP Installation Order

LISLE, Ill. -- Navistar Defense, LLC received an award to conduct the installation work associated with its January order to upgrade 2,717 International® MaxxPro® Mine Resistant Ambush Protected (MRAP) vehicles with a new vehicle chassis. The \$21 million contract from the U.S. Army Contracting Command is just one of Navistar's many reset offerings aimed at revitalizing existing defense assets for future missions.

"We are focused on increasing the capabilities of our existing fleet with minimal impact to defense funding," said Archie Massicotte, president, Navistar Defense. "The vehicle reset line we established for this installation work can also be utilized to restore older vehicles to like-new condition. Therefore, we are poised and ready to reset vehicles returning from deployment – either here at our facility or overseas."

The installation contract retrofits vintage MaxxPro vehicles with a new rolling chassis. This chassis enhancement includes the addition of the DXM™ independent suspension, a MaxxForce® 9.3 engine, 570 amp alternator and driveline, while leaving a residual chassis with a beam axle that can be reused. The retrofits will be conducted in West Point, Miss., and work is expected to be completed by the end of May 2012.

"Keeping constricting budgets in mind, we continue to anticipate tomorrow's needs and develop new solutions to use existing assets," said Massicotte. "In addition to being ready for reset work, we already have options available that reuse the leftover chassis from this body-swap."

Should the government be interested in reusing its remaining vehicle chassis, Navistar can add an armored cab to the chassis or return the vehicle to a commercial flatbed truck by adding a standard commercial cab for roughly a third of the cost of a new vehicle. Additional variants that can be produced on this building-block model include a recovery vehicle and a utility truck with an integrated capability for exportable power generation.

The company has fielded nearly 9,000 MaxxPro vehicles and continues to anticipate needed vehicle capabilities, enhancements, reset and reuse options for its entire fleet of 32,000 vehicles.

## Defence Industry

### The G6 -Still outgunning the competition

Twenty five years after it astonished the global defence community, South Africa's G6 self-propelled Gun-Howitzer still sets the standards against which all long-distance artillery are being measured.

"The G6 was ahead of its time when it was first launched in 1987," says Stephan Burger, the CEO of Denel Land Systems. "Through our continuous research and investment in the gun we have ensured it remains



ahead of the pack as the most versatile and reliable artillery system in its class.”



“We are still outgunning all our global competitors by a wide margin,” he says.

Burger says Denel Land Systems (DLS) is undoubtedly a world leader in the design, development and manufacturing of artillery. Modern armies still requires agile and flexible artillery systems to support troops involved in both high-intensity warfare and peace-keeping operations.

Artillery is used to establish fire superiority and hit high-value targets over long distances providing armies with a tactical and operational edge against enemies. The fact that it is self-propelled enables it to keep pace with mounted infantry and armour units over extended distances.

Based on the locally-developed G5 the 155mm G6 revolutionised artillery with its ability to hit targets over exceptionally long distances with an outstanding degree of accuracy.

Mounted on a wheeled chassis the G6 is self-propelled, giving it a remarkable agility and ultra-quick reaction time. Its ability to hit targets more than 65km away at a rate of fire of six rounds per minute confirmed its reputation as one of the most versatile artillery systems ever developed.

In addition to the South African National Defence Force the G6 has also been acquired by the United Arab Emirates and Oman.

Burger says Lyttelton Engineering Works – the predecessor of Denel Land Systems – initially designed the G6 to meet the need for an accurate, long-range artillery system that is highly mobile and easy to operate.

The upgraded G6-52, was first launched in 2003 and is continuously being modified to “remain at the front of the pack” in modern artillery systems.

Some of the key features of the G6-52 are:

- Mobility and speed - Traditionally artillery pieces had to be towed, thus restricting its effective deployment in difficult terrain. The six-wheeled G6 changed the face of artillery because it is self-propelled, with the ability to reach speeds of 85km per hour on roads and 35 km per hour in off-road conditions. It can traverse terrain to a gradient of 40 degrees and cross trenches of up to one meters
- Range – the G6-52 increased the operational range from 50 kilometres – already considered to be remarkable – to 58 kilometres making it the premier system of its kind in the world.

- Accuracy – The gun is fitted with an accurate inertial and GPS navigation system. A ring laser gyro based gun laying system ensures accurate gun pointing to within 1mil (0.05 of a degree). Up to five rounds can be fired to impact simultaneously on the same target by means of the G6-52's advanced AS2000 artillery target engagement system. This maximises the surprise element to achieve better effect on the target.
- Ease of operation – the G6 is served by a crew of between 3 and 5 which includes the driver, commander, gun layer, ammunition loader and breech operator. The on-board gyro-controlled navigation system enables the gun to be brought into action within 60 seconds of stopping and it can move off within 30 seconds after firing.
- Rate of fire – the gun can fire projectiles at a rate of six rounds per minute.
- Full-protection – the G6 is protected against counter-battery fire and its mobility makes it an extremely difficult target to locate and hit. The armoured turret and hull provide protection against small arms fire and shell splinters while the chassis can withstand multiple landmine explosions.
- Adaptability – the gun is capable of firing a wide range of 155mm ammunition including velocity-enhanced long-range projectiles (V-LAP).
- The ammunition for the G6 has been developed in South Africa and is supplied by Rheinmetall Denel Munition.

## Defence Industry

### Ukraine holds talks on sale of T-84U Oplot battle tanks to Azerbaijan



According to APA, presentations of new tanks were held for Azerbaijani specialists and appreciated. At present, the discussions on sale and purchase of tanks are at the final stage.

Oplot has the highest performances among the T-series tanks produced in CIS place. At the beginning, this tank exceeds T-90 for several functions, said the spokesman of the Machine-building and constructor bureau named after A.Morozov.

According to him, the details are not known because of the talks are held by Ukrspetseksport Company and Ukrainian Defense Ministry.

## Robots

### TORC Robotics Announces Unmanned Vehicle Conversion Kits for Ground Robotics Market



TORC Robotics now offers unmanned vehicle conversion kits to rapidly configure by-wire, tele-operated, and autonomous control on customer selected mobility platforms. An open architecture supports the integration and control of modular mission payloads, allowing the kits to be used in a wide range of applications from basic unmanned vehicle research to Warfighter-ready solutions, including IED detection and defeat, ISR, RSTA, and CBRNE missions.

The kits integrate tightly with host vehicle systems to provide significant performance advantages over “one size fits all” solutions, while maintaining all of the vehicle’s original capabilities for manned operation. By leveraging its Robotic Building Blocks™ product line for drive-by-wire conversion, safety, power management, autonomous navigation, and operator control, TORC is able to focus on the integration of customer-defined capabilities and mission-specific behaviors.

“While we continue to provide standalone products like the SafeStop and ByWire XGV, most of our customers are looking for more integrated solutions. These kits are based on the modular approach that we have used internally for the last six years on projects such as the Ground Unmanned Support Surrogate [GUSS] and the NFB Blind Driver Challenge,” states Michael Fleming, CEO of TORC. “They are a natural extension of our product line and do a much better job communicating the value that TORC adds to those seeking unmanned ground vehicle capabilities.”

The ByWire™ Kit provides the base vehicle conversion by integrating drive-by-wire control, power management, and safety interlocks to the platform. This provides control and monitoring of critical vehicle functions, allowing for the addition of tele-operated and autonomous capabilities. The modular components are able to interface with actuators and existing CAN networks to take advantage of factory vehicle systems. The ByWire features integrated SafeStop emergency stop technology, real-time system-wide health monitoring, redundant power and sensors, and automated failsafes to ensure the system and operator stay protected.

The Tele-Op Kit interfaces with the ByWire to provide remote control of the vehicle and modular mission payloads. TORC’s operator interface provides intuitive vehicle, camera, and payload control and can be

installed on multiple hardware options. A flexible video system offers multiple camera options and inputs for payload control to maximize the operator’s situational awareness. The Tele-Op Kit includes a SafeStop handheld transmitter to provide an independent, wireless safety link to the ByWire, with an optional OEM SafeStop embedded within the operator control unit.

The Autonomy Kit provides multiple levels of autonomous control capable of operating in a wide range of environments and with custom, mission-specific behaviors. TORC’s autonomy has demonstrated performance in cluttered off-road terrain, urban roads, and GPS-denied areas for extended periods. The core technology of the Autonomy Kit is the AutoNav™, TORC’s scalable, customizable suite of autonomous navigation software modules.

This functional approach allows customers to select the most appropriate vehicle platform based on their mission requirements, then add conversion kits to up-fit the with necessary robotic capabilities. Contact TORC to learn more about how the robotic conversion kits can work with your vehicle, missions, and payloads.

Source :

## Contracts

### Textron Marine & Land Systems Awarded Contract Option for Additional Afghanistan National Army Armored Vehicles



New Orleans, LA -- Textron Marine & Land Systems, an operating unit of Textron Systems, a Textron Inc. company, announced today that it received an option award from the U.S. Army Contracting Command, Warren, Mich., for 64 additional Mobile Strike Force Vehicles (MSFV) for the Afghanistan National Army (ANA).

The additional vehicles are added to the current Unfinitized Contract Action (UCA) and have a not-to-exceed value of \$71.7 million, with deliveries scheduled by February 2013. Three variants will be produced: MSFV with enclosed Turret; MSFV with Objective Gunner Protection Kit; and MSFV ambulance. Vehicle production will be performed at Textron Marine & Land Systems' facilities in the New Orleans area.

Mobile Strike Force Vehicles are derived from the combat-proven M1117 Armored Security Vehicle (ASV), and are configured with Enhanced Survivability (ES) capability, which improves blast protection to

mine-resistant, ambush-protected (MRAP) levels. The ES-equipped vehicles continue to possess the ASV's original, all-important V-shaped hull design, in addition to innovative protection design features that enable it to meet MRAP blast protection standards.

Reliability and supportability of these vehicles for the ANA is reinforced by a Total Package Fielding concept, which includes technical manuals, spares, and comprehensive operator and maintenance training.

Textron Marine & Land Systems, in June 2011, was awarded full-rate production for 240 MSFVs along with associated support equipment, spare parts, field service representatives, training and training aids. Initial deliveries of these vehicles into Afghanistan are underway.

"These highly mobile, powerful and well-protected vehicles will play an important role in the Afghanistan government's ability to address threats and defend its people," explains Tom Walmsley, TM&LS senior vice president and general manager. "Our Afghanistan-based team of trainers and field service representatives are working closely with the U.S. Army's Maneuver Support Center of Excellence and Coalition Forces to prepare ANA Mobile Strike Force units to take full advantage of the MSFV's capabilities."

Textron Marine & Land Systems has delivered more than 3,600 M1117 ASVs and related configurations to the U.S. Army, as well as additional armored vehicles to military and police forces in Iraq, Colombia and Bulgaria. These vehicles have consistently achieved exceptional operational readiness and combat availability rates greater than 90 percent over the life of the U.S. Army program. Through February of this year, Textron Marine & Land Systems also has achieved 78 consecutive months of on-time ASV deliveries to the U.S. Army.

### Defence Industry

#### BAE Systems-Led Team to Submit Proposal for JLTV EMD Phase



BAE Systems, along with teammates Northrop Grumman and Meritor Defense, announced today that they plan to submit tomorrow a proposal for the Engineering and Manufacturing Development (EMD) phase of the Joint Light Tactical Vehicle (JLTV) program.

"We kept the best from the Technology Development

phase and applied it to our EMD vehicles, and we've made refinements to perform even better," said Glenn Lamartin, BAE Systems JLTV Capture Lead. "Our JLTVs are protected and survivable, light enough for transport by air or sea, and agile on road and off. Most importantly, they are affordable. This is truly a vehicle that is going to meet the needs of our service men and women." As part of its proposal, BAE Systems is proud to announce the selection of a Ford Motor Company engine to power our JLTV family of vehicles—the Power Stroke® 6.7 liter turbocharged diesel with class-leading fuel economy and the best horsepower and torque of any engine in its class. This is the same engine Ford designed, engineered, and built to power its F-Series Super Duty® trucks.

"We have worked hard over the last year to strengthen our team and our offer, bringing together the best of the defense and automotive industries," said Ann Hoholick, BAE Systems Vice President of Amphibious & New Programs. "Ford products have a reputation for dependability and performance, even under challenging conditions. With their experience in commercial trucks, we see this as a great fit for our JLTV offer. It's a win for us and a win for our valued customers."

The government plans to award up to three EMD contracts in June of this year. The EMD phase of the JLTV program entails the delivery of 22 prototype vehicles and other equipment for testing, and it brings the U.S. Army and Marine Corps closer to a final vehicle to support and benefit our warfighters.

### Defence Industry

#### General Tactical Vehicles Delivers Proposal for JLTV EMD Phase

The General Tactical Vehicles (GTV) team of General Dynamics Land Systems and AM General today delivered our proposal for the Engineering, Manufacturing and Development (EMD) Phase of the U.S. Army and U.S. Marine Corps Joint Light Tactical Vehicle (JLTV) program to the U.S. Army TACOM Life Cycle Management Command in an EAGLE vehicle – our ready-now offering for the JLTV requirement.

The JLTV EAGLE is a reliable, operationally cost effective and low-risk solution for the JLTV requirements. The GTV JLTV EAGLE is a combat proven vehicle optimized for the U.S. Army and the expeditionary forces of the U.S. Marine Corps.

GTV's JLTV EAGLE provides the U.S. Warfighter with unparalleled protection with its Double V Hull technology. By restoring balance to the "Iron Triangle" of protection, payload and performance, the GTV JLTV EAGLE fills tactical mission expeditionary requirements affordably.

"GTV understands the urgency and criticality of providing the Warfighter with an operationally effective, survivable, and suitable JLTV solution. With the GTV JLTV EAGLE, we offer a modified non-developmental, low-risk vehicle with inherent manufacturing readiness



that is built for program success and an accelerated path to production. We are on the ground and running,” said Mark Roualet, Chairman of the GTV Board of Directors. “We have a team with unparalleled experience that is offering a mature, fully transportable and highly reliable solution that is ready now. We have taken a tremendous vehicle and made it better – a combat proven platform, optimized for the U.S. Soldier and U.S. Marine.”

Roualet added, “The GTV approach is about accountability, ownership, discipline, focus, speed, and commitment. This commitment extends to schedule, meeting cost requirements, and delivering high quality equipment to Soldiers and Marines.”



## Army

### Army sees 10,000 CROWS manufactured



The Army is marking the manufacture of the 10,000th M153 Common Remotely Operated Weapons Station, known as CROWS.

The CROWS system allows a weapon such as the M2 .50-caliber machine gun to be mounted atop a vehicle, such as the Humvee, and be targeted and fired remotely from inside the vehicle. This allows a Soldier operator to stay safely inside the vehicle.

Army officials from PEO Soldier, along with Pennsylvania Congressman Mark Critz and Norwegian Defense Attaché Rear Admiral Trond Grytting are attending a March 26 event at Kongsberg Protech Systems in Johnstown, Pa.

"The growth of this program can be primarily attributed to one thing -- Soldier demand," said Mary Miller, deputy PEO Soldier. "CROWS continues to prove itself as a significant force multiplier on the battlefield with tremendous opportunities for further development."

The Army has fielded thousands of CROWS II systems in support of Soldiers since 2007 across the theater of operations on more than a dozen vehicle platforms. The program reached a major milestone in February when the Army classified the CROWS program with ACAT I status, recognizing the CROWS among the elite levels of the DOD's major defense acquisition programs.

CROWS is a turret system that provides Soldiers the ability to employ cameras, sensors, and weapons from inside the protection of an armored vehicle. CROWS provides fire superiority for the Soldier as a result of its

ability to turn "area weapons," such as the M2 .50 caliber machine gun into on-the-move precision engagement weapons.

The Army launched its third CROWS competition January 9. The new contract will enable the Army to procure additional CROWS systems; maintain current and new systems with repairs and spare parts; and secure engineering services needed for product improvements and field service support. The contract competition closed March 23 and the Army anticipates awarding a contract in the fall of 2012.

### EXPANDING CROWS CAPABILITY

Program engineers and Soldiers alike continue to expand upon the range of applications possible for the CROWS platform. One example is the fielding of one of the Army's "Greatest Inventions" for 2010, the "Green Eyes" Escalation of Force Kit. The non-lethal green laser offers Soldiers an interim step in the escalation of force by temporarily disrupting vision and sending a warning signal across language and cultural barriers to keep innocent people from entering into harm's way.

The Army's product manager for crew served weapons incorporated Soldier feedback from an earlier operational assessment to improve the fit and function of a second generation of escalation of force kits.

Soldiers recently began to look for ways to leverage CROWS' target identification and day/night surveillance capabilities in support of force protection. Units requested fixed site mounting kits to install CROWS in guard towers to better monitor areas and target threats remotely from inside a protected structure. PM CSW began installing fixed sites in January 2012. Fielding teams plan to install systems at various combat outposts and forward operating bases throughout Afghanistan in 2012.

Other accessory upgrades of interest include a secondary screen to assist in verifying enemy combatants prior to engaging with lethal force, enhanced sensor capability, additional weapon integrations such as Javelin, and integrated 360-degree situational awareness.

The Maneuver Support Center of Excellence, which acts as the proponent for the CROWS program, is currently developing a new requirement that will determine what the future CROWS will provide in terms of capability and characteristics. The next chapter for CROWS will be written in the coming years as the proponent's new requirement is staffed, approved, and executed by PM CSW.



## Contracts

### UAE Ministry of Interior acquires 200 NIMR vehicles

The UAE Ministry of Interior signed a contract with Tawazun Holding, to acquire 200 high mobility tactical NIMR vehicles at the fringe of International Security and National Resilience Exhibition and Conference (ISNR 2012) being staged at Abu Dhabi National Exhibition Centre.

The deal strengthens confidence in local products which match in their specifications those of major international manufacturers.



Tawazun Holding is a strategic investment firm focused on the long-term development of Abu Dhabi's industrial manufacturing and technology capabilities and knowledge-transfer with a specific focus on the defense sector.

Established in 2007 as a fully owned subsidiary of Offset Program Bureau, Tawazun Holding's mission is to develop profitable ventures through industrial partnerships and strategic investments that add to Abu Dhabi's industrial manufacturing layer in the areas of defense, defense manufacturing and manufacturing technology.

Made by Abu Dhabi-based Nimr Automotive, a subsidiary of Tawazun Holding, NIMR multi-purpose vehicles have potential applications ranging from tactical missions in harsh environments such as arid deserts to modern urban warfare, deep infiltration missions, reconnaissance, border surveillance, support logistics and riot control.

NIMR vehicles can be employed in many roles, including as an armament carrier, logistics vehicle, ambulance, mobile Command and Control centre, and as a platform for a wide variety of other uses including conforming to multiple fleet strategies of the armed forces.

## Exhibitions

### Elbit Systems Extends its Portfolio of Long-Range Observation and Target Acquisition Systems with the Launch of Long View CR at Defexpo India 2012



Elbit Systems announced today the launch of Elbit Systems Electro-Optics – Elop's Long View CR, to be displayed at Defexpo India 2012 in the Company's booth (Israel Pavilion, Booth 11.10B).

Providing an innovative combination of target acquisition and observation capabilities, the Long View CR is extremely lightweight and cost effective as it combines a very long-range continuous optical zoom FLIR, long-range day cameras, integral eye safe laser range finder, GPS and a magnetic compass all in one, compact configuration. For dismounted operations, the Long View CR is operated on a miniature electronic goniometer enabling high azimuth and elevation accuracy.

Enhancing the Company's portfolio of high quality target acquisition and observation systems, Long View CR is considered among the lightest long-range targeting acquisition systems available on the market, weighing less than 12.5 kg. The advanced system can be carried in a backpack or mounted on a vehicle, making it especially suitable for long-range Intelligence Surveillance Reconnaissance (ISR) missions performed by Special Forces, Forward Observers (FO) in stationary observation posts or reconnaissance vehicles. With its proprietary algorithms and technologies, the Long View CR has the unique ability to acquire long-range targets or to observe small targets, such as enemy fighters, in high spatial resolution under severe visual conditions day or night.

## Future Technologies

### The Oshkosh Defense JLTV Solution Delivers Next-Generation Performance and Crew Protection



OSHKOSH, Wis. -- Oshkosh Defense, a division of Oshkosh Corporation (NYSE:OSK), today presented its solution for the Engineering Manufacturing & Development (EMD) phase of the Joint Light Tactical Vehicle (JLTV) program.

With the JLTV program, the U.S. military is seeking to modernize its light vehicle fleet. Oshkosh is offering the latest generation of its Light Combat Tactical All-Terrain Vehicle (L-ATV) to upgrade the light tactical fleet with MRAP-level protection and unprecedented mobility in future missions. The Oshkosh L-ATV has been extensively tested and proven to meet or exceed all of the JLTV program's requirements.

"Military leaders have recognized JLTV as one of their top modernization priorities, and the Oshkosh L-ATV entry represents our significant investment in this project and showcases our advanced technology," said John Bryant, vice president and general manager of Joint



and Marine Corps Programs for Oshkosh Defense. "Our engineers have drawn upon extensive tactical vehicle operating experience in Iraq and Afghanistan to develop the L-ATV, with an eye toward future combat environments."

### **The Light Combat Vehicle, Redefined**

The Oshkosh L-ATV is designed to keep Warfighters safe as battlefield threats evolve. The vehicle's crew protection system has been extensively tested and proven to optimize protection, weight and mobility. The L-ATV can accept multiple armor configurations so it can easily be adapted to changing operational requirements.

The L-ATV also uses the Oshkosh TAK-4i™ intelligent independent suspension system, building on the success of the TAK-4 family of suspensions used on more than 20,000 military vehicles. The TAK-4i system is tailored for high-performance, lightweight vehicles to give Warfighters unprecedented mobility in severe off-road terrain. It uses an advanced Oshkosh technology to deliver 20 inches of independent wheel travel; 25 percent more than any vehicle fielded with the U.S. military today. Oshkosh's innovative L-ATV delivers expanded power capabilities, greater fuel efficiency and integrated diagnostics compared to legacy engine technologies. An optional Oshkosh ProPulse® diesel-electric hybrid powertrain is available to further improve fuel economy, lower life-cycle costs, and provide high levels of stationary and on-the-move exportable power.

### **Rigorous Development**

Oshkosh committed significant resources for light vehicle research and development to produce the L-ATV. In preparation for the JLTV EMD phase, six generations of Oshkosh light vehicles were developed to respond to evolving requirements. Oshkosh's L-ATV designs have been verified through extensive JLTV mission-profile testing. Notably, an L-ATV prototype called the LCTV completed the 1,061-mile Baja 1000 off-road race in the unforgiving terrain of the Mexican desert, demonstrating its unprecedented performance capabilities and reliability. "Since 2006, we have aggressively and continuously worked to design, develop and test the L-ATV to deliver a robust, mature solution for the JLTV EMD phase," Bryant said. "Our new product development process allowed us to develop multiple generations, which is why our JLTV solution is currently ready for Low Rate Initial Production."

### **Decades of Proven Value**

As a long-time vehicle and service provider to the U.S. military, Oshkosh has a history of superb program execution and the Oshkosh JLTV solution is no exception. Working closely with its vast supplier network, Oshkosh has optimized its L-ATV vehicle design while gaining economies of scale across a spectrum of military, commercial and industrial vehicle programs.

Oshkosh has produced more than 100,000 military-class trucks and trailers to date, including the medium- and heavy-payload vehicles for the U.S. Army and Marine Corps, and the MRAP All-Terrain Vehicle

(M-ATV). Oshkosh uses a flexible, integrated manufacturing approach to build vehicles for different military programs on a single assembly line, which helps keep costs low. In addition, Oshkosh is equipped to manufacture components and parts in-house – including key subsystems such as suspension systems, which other manufacturers must purchase from suppliers.

### **Future Technologies**

#### **Navistar Defense Submits Bid for Joint Light Tactical Vehicle Program**



Navistar Defense, LLC today announced it has submitted a bid to compete for the Joint Light Tactical Vehicle (JLTV) program. The company will bid with a variant of its International® Saratoga™ light tactical vehicle, which Navistar launched in October after conducting its own automotive and blast testing.

Channeling Navistar's commercial background, the Saratoga was originally designed to target a gap in the light tactical vehicle market. Its flexible platform is derived from an integration strategy that allows the company to rapidly develop new vehicle variants to meet different customer needs while keeping investment costs low.

"We made a significant investment in developing the Saratoga on our own nickel because that's what we do commercially – it is part of our DNA," said Archie Massicotte, president, Navistar Defense. "The Saratoga is a solid design and now that we have seen the requirements of the JLTV migrate toward our vehicle capabilities, we are in a position to modify the Saratoga to fit those requirements."

The Saratoga light tactical vehicle has a high degree of commonality with fielded vehicles and incorporates Navistar's automotive and manufacturing expertise. The company has also designed and tested its own proprietary survivability solution for the vehicle, which considers material mix, vehicle structure and hull shape.

### **Future Technologies**

#### **Lockheed Martin's Production-Optimized JLTV Is Lighter and Costs Less**

DALLAS -- Lockheed Martin Mar. 27 submitted a proposal for a substantially lighter and more affordable Joint Light Tactical Vehicle (JLTV) for the next phase of the U.S. Army and Marine Corps

competition.



The Lockheed Martin team optimized its Engineering and Manufacturing Development (EMD) design for production while maintaining the proven force protection, mobility, transportability and reliability of the earlier Technology Demonstration (TD) model.

"Our improvements removed hundreds of pounds of weight from our TD design, which was already proven in helicopter lift tests," said Scott Greene, vice president of ground vehicles at Lockheed Martin's Missiles and Fire Control business. "With more than 160,000 combined testing miles behind us, we've demonstrated our JLTV can reliably meet protection standards of many existing mine-resistant vehicles in combat today. This vehicle is ready to meet our customers' needs with lower-cost materials at full-rate production."

Throughout 2010 and 2011, the team took lessons learned from JLTV's extensive testing and applied them to an evolved design. The team accomplished this through digital engineering analysis, virtual design builds, component tests and physical stress testing.

"Our EMD design lowers the cost of each vehicle, and not just through economies of scale," said Kathryn Hasse, Lockheed Martin's JLTV program director. "We have incorporated more affordable materials and reduced exotic metals such as titanium. This was accomplished while maintaining the significant blast protection and vehicle capability already demonstrated."

BAE Systems, a Lockheed Martin JLTV team member, helped develop the production process verified by the virtual design build. The team benefits from BAE Systems' expertise in advanced armor solutions and production facilities for high volume assembly.

Formed in 2005, the core Lockheed Martin-led JLTV team includes the tactical wheeled vehicles team at BAE Systems in Sealy, Texas, complemented by numerous Tier 1 automotive suppliers, including: Cummins Engine, Allison Transmission, Bosch, Meritor Defense, Lotus Engineering, L3 Combat Propulsion Systems and Vehma International of America.

## Defence Industry

### U.S. Army Orders More Oshkosh FMTVs

OSHKOSH, Wis. -- Oshkosh Defense, a division of Oshkosh Corporation, will produce more than 2,500 additional Family of Medium Tactical Vehicles (FMTV) trucks and trailers for the U.S. Army following an order from the U.S. Army TACOM Life Cycle Management Command (LCMC).

The Army has now ordered more than 29,000 FMTV trucks and trailers from Oshkosh.



"Over the first three years of this five-year contract, we have delivered superior-quality trucks and trailers for soldiers for their combat operations, relief efforts and unit-resupply missions at home and abroad," said Mike Ivy, vice president and general manager of Army Programs for Oshkosh Defense. "We will continue to offer fleet improvements by developing prototypes with upgraded technology, such as our TAK-4® independent suspension system that improves off-road mobility, ride quality and protection capabilities."

Oshkosh Defense's rigorous production and quality processes ensure on-time delivery of high-quality trucks and trailers. The FMTV is a series of 17 models ranging from 2.5-ton to 10-ton payloads. Vehicles have a parts commonality of more than 80 percent, resulting in streamlined maintenance, training, sustainment and overall cost efficiency.

This is the latest order under the five-year FMTV contract awarded to Oshkosh Defense for the production of trucks and trailers, as well as support services and training, through calendar year 2015. The order is valued at more than \$294 million and deliveries are scheduled to be completed in February 2014.

## Future Technologies

### AM General LLC Submits Independent JLTV Solution



SOUTH BEND, Ind. -- AM General LLC announced Mar. 28 that it is backing two separate proposals for the Engineering, Manufacturing and Development (EMD) phase of the Joint Light Tactical Vehicle (JLTV) program.

AM General has submitted an independent JLTV solution for the EMD phase based on more than a decade of the company's own investments in research, development and testing for the next-generation light tactical military vehicle.

AM General's new Blast-Resistant Vehicle – Off Road

(BRV-O) is a highly mobile and versatile platform that meets or exceeds 100 percent of the government's program evaluation criteria including protection, performance, payload, transportability, reliability and affordability. BRV-O features a crew capsule and modular armor already proven effective in government-supervised blast testing. This AM General design can be readily adapted to future changes in U.S. military missions, enemy threats and new protection technologies as they emerge.

BRV-O also features a lightweight, fuel efficient, high performance engine; a self-leveling suspension system; a C4ISR backbone with open-standard networked architecture and clustered super-computing power, and other advanced components. These and other mature subsystems have been tested, refined and validated. This makes BRV-O cost effective and production ready, with the high degree of reliability needed by U.S. service members.

AM General also is supporting a separate proposal from General Tactical Vehicles, the joint venture formed in 2007 with General Dynamics Land Systems. GTV received one of three Defense Department contracts for the Technology Demonstration phase of the JLTV program.

Both of the proposals backed by AM General have the added value of the company's 50-plus years of experience – making it, by far, the most experienced light tactical military vehicle developer and manufacturer in the United States.

Sales Manager for Defence Simon Hurst said “MTL Group has been working with armoured vehicle manufacturers for many years now on a global scale and are recognised by the worlds leading vehicle manufacturers as not just a supplier of armoured steel components but as the leading specialist in DFM. Our customers are relying more and more on both our cutting edge technology and in depth knowledge and experience in this field”

‘Our knowledge and experience in processing armour plate and high strength material allows us to do three things for the OEM’

### **‘Make it Lighter, Make it Stronger and Make it Lower Cost’**

DFM is a specialist added value engineering service for the Defence sector; this is carried out by a dedicated cross functional team at MTL Group at the design stages, reviewing the customers design and look at alternative processing methods to reduce weight, cost and increase the protection levels.

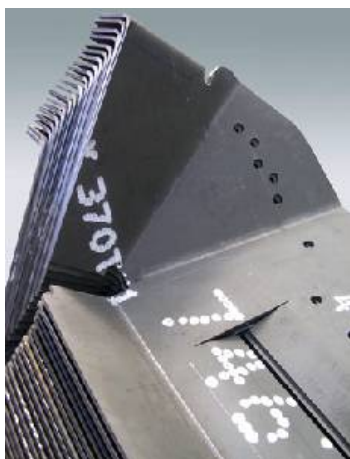
‘We have identified India as a key market in which MTL Group can offer something different and assist the vehicle manufacturers at the design stage to create a lighter, better protected and lower cost vehicle’ said Hurst.

MTL Group is known as the armour bending experts in the defence industry and will also be displaying one of its armoured steel one piece Blast Floors along with its Stanag Level 3 IMPAS solution at DEFEXPO2012 INDIA.

MTL Group will be exhibiting on Stand 14.6 at DEFEXPO INDIA in hall 14.

## **Exhibitions**

### **MTL Group's Advanced Design Solutions at DEFEXPO INDIA 2012**



Armour experts MTL Group will be displaying their DFM (Design For Manufacture) capabilities at DEFEXPO 2012 INDIA. They will also introduce a new range of innovative solutions for processing armour plate which includes IMPAS add-on armour.

IMPAS is a light weight add-on steel armour solution that gives the customer a lower cost alternative to ceramic and composite armour. IMPAS offers protection against various threat levels including, Stanag 4569 Level 2. Stanag 4569 Level 3 and FB7

## **Defence Industry**

### **Contract with French Renault Truck Defense on Remote Weapon Systems**

KONGSBERG has booked an order on the remote weapons stations (RWS) valued at NOK 100 millions from the French Renault Truck Defense.

The order is part of the NOK 500 million framework agreement with delivery of the PROTECTOR weapon control system to upgrade the French Army's Renault VAB 4x4 armored personnel carriers. The order was disclosed on 2nd May 2008.