

# Army Guide monthly



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## Defence Industry

### Norwegian Army purchases DINGO 2



Munich -- The Norwegian Army has responded to the increased threat of attacks by commissioning Krauss-Maffei Wegmann (KMW) with the delivery of 20 DINGO 2 heavily armoured wheeled vehicles.

The troops operating at the Hindu Kush are in need of the vehicles more than ever; since the beginning of the year, soldiers have been confronted with an increasing number of assaults by insurgents. By the end of November, the first ten vehicles shall be delivered by KMW and transported to the operational area. The remaining vehicles will follow in February 2011.

Belgium, Germany, Luxembourg, Austria and the Czech Republic also make use of the DINGO 2.

The DINGO 2 is operated as a patrol and protection vehicle. Additionally, KMW supports the Norwegian forces with its service teams in Afghanistan. These cover tasks such as maintenance and repairs. The contract includes the delivery of specialised tools, the training of the vehicle crews and the option to purchase further vehicles.



### U.S. Army building smarter robots



WASHINGTON -- The U.S. Army is exploring ways to upgrade its fleet of roughly 3,000 small tactical robots in Iraq and Afghanistan designed to safeguard Soldiers by clearing buildings and caves and using sensors to sweep areas for Improved Explosive Devices, service officials said.

New technologies bring the promise of deploying small robots which can search for bombs, map areas and detect hazardous materials -- all with little or no tele-operation or human intervention.

"We are moving along that spectrum from tele-operating to semi-autonomy where you can send a robot from point A to point B without any intervention. If it has a problem, it will pop up and indicate it has

found an obstacle," said U.S. Marine Corps Lt. Col. David Thompson, project manager with the Robotic Systems Joint Program Office.

The Army and Marine Corps are working with industry and academic partners to look at ways to add new software to existing robots -- such as iRobot's PackBot and QinetiQ North America's TALON -- enabling them to perform more functions and navigate uncertain terrain without needing their every move to be controlled or tele-operated by a human.

"We are looking at ways to make the systems that we already have out there better. We are working with infantry and the (Military Police) to look at how we can enhance the capabilities of our current robots to meet their needs," said Thompson.

Some of the newer robotic capabilities, such as automatic self-righting and retro-traversing, enable robots to correct course, change direction or turn right-side up -- by themselves.

"We're looking for modularity and interoperability. It will take the burden off the user. I want a robot to go from point A to point B by itself, and tell me when it gets there," Thompson said. "We're going to get better interface with the cameras and the grippers -- and a lot more understanding of where the robot sits in space."

A more autonomous robot allows the user to free up energy which would otherwise be focused purely on navigating the robot. This will allow the user to attend to additional concerns, robotic functions or threats.

"We want to be able to allow Soldiers to interact with the robots at a high level of supervisory input to the robots. To do that, the robot has to start understanding where it is, start understanding about what is in the way, and how to get around obstacles," said Colin Angle, chairman and chief executive officer, iRobot.

For instance, iRobot's AwareHead supervisory control system software enables semi-autonomous navigation; the robot uses infrared sensors to map an area by itself, allowing a human controller to point-and-click on a touch-screen to send the robot to a given destination.

"When we started, we had one robot and one controller, now you have much more operational and logistical flexibility. The exciting part is we're right at the cusp of much, much smarter robots. Yesterday's robots were head down, one guy controlling the robot every step of the way. Now, we are talking about robots that can do much more for themselves," said Joseph Dyer, chief operating officer, iRobot.

QinetiQ North America is also working with the Army and Marine Corps to advance robotics technology; at Fort Benning, Ga., their TALON Explosive Ordnance Disposal robot recently demonstrated an ability to navigate and map a room without human intervention, company officials said.

"We demonstrated a completely autonomous TALON robot with chemical, biological and radiological detection abilities. A map was created about 1,000 meters away from the building showing what was inside a building and where the hazards were -- the robot was able to do that without any tele-operation," said Robert

Quinn, vice president, TALON Operations, QinetiQ North America.

"In Afghanistan, 80 percent of the IEDs are homemade explosives, so having the ability in 30 minutes or less to do a complete investigation of buildings and check for homemade explosives -- without Soldiers ever entering the building -- is awfully important," Quinn said.

In order to maximize the occasion to learn from Soldiers in combat and harness their critical feedback, the Robotic Systems Joint Program Office has several facilities in Iraq and Afghanistan, Thompson said.

"Feedback that we need from the warfighters is critical," he said.

"You can send it out there where a man should not go in order to counter a threat and do the dull, dirty, or dangerous jobs," said Thompson. "I would rather have a robot blown up than a Soldier or Marine."

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## Training And Simulators

### SAIC to Demonstrate Advances in Integrated Simulation Solutions at I/ITSEC

Science Applications International Corporation will feature advanced simulation and training environments at the Interservice/Industry Training, Simulation and Education Conference (I/ITSEC) November 29 – December 2, at the Orange County Convention Center in Orlando, Fla.

With the theme "Empowering through Integration" SAIC will demonstrate novel applications for live, virtual, and constructive solutions including:

#### **A Virtual Command Simulation Environment (VCSE)**

Powered by SAIC's On-Line Virtual Interactive Environment (OLIVE), the VCSE brings together almost any data source into a distributed, persistent virtual environment that enables training and decision support. The VCSE showcases its capabilities in a series of realistic multi-echelon, domain-focused scenarios featuring:

- Rogue nation missile testing detection and defense
- Counter-terrorist combined arms coordination
- Urban cyber defense operations
- First responder emergency medical simulation

#### **The SAIC Mobile Training Range**

This mobile range provides a highly deployable instrumentation, live training, and training support environment including:

- SAIC fourth generation range instrumentation capability and innovative wireless tactical engagement simulation solutions for vehicles and warfighters
- Secure WiFi and high resolution video capture, software-definable radio solutions, and land and maritime capability

#### **Expanding Common Driver Trainer (CDT) Product Line**

SAIC is introducing new innovative features to the

CDT product line including:

- A reconfigurable crew cab that supports collective task training
- Configured as an RG33 with an articulated arm to interrogate improvised explosive devices
- Ready for integration into a standard trailer and mobile training facility to deliver driver training to our Warfighters wherever they are
- New and improved visual display system that enhances the fidelity of the visual scenes, and reduces the overall footprint of the system and total life cycle costs

#### **OLIVE Virtual Command Operations Integrate Multi-Threads into Realistic, 3-D Environment**

SAIC's OLIVE software platform provides a secure, realistic, virtual 3-D environment that enables distributed users to connect, collaborate, train, rehearse, and operate just as they would in the real world. OLIVE operates over computer networks using a video game-like 3-D user interface that provides access to a variety of functionality and media. OLIVE supports the rapid integration of a vast variety of critical information and imagery from satellites, sensors, streaming video and web content, PowerPoint, distributed operations, live exercises, and more to enable faster, real-time decision-making and rapid response.

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## Future Technologies

### Sniper Teams to Increase Accuracy with Guided Rounds

Sniper teams remain the most lethal force on the battlefield and have been credited with many successful engagements.

As effective as sniper teams are however, their accuracy is fundamentally limited by random variables such as changing winds, muzzle velocity dispersions and round-to-round variations. The DARPA EXtreme ACCuracy Tasked Ordnance (EXACTO) program aims to maximize the effectiveness of sniper teams while improving their safety.

Through EXACTO, DARPA is developing a guided round capability in a .50 caliber platform. It is currently intended to provide snipers the capability to engage targets moving at much greater speeds, in tougher environmental conditions such as in high winds and at far longer ranges than currently possible. A guided sniper round would greatly increase accuracy by allowing compensation for environmental effects and target motion while dramatically reducing the engagement timeline.

"Between Iraq and Afghanistan, the need for trained snipers has increased dramatically", says DARPA program manager Lyndall Beamer. "It's time we look at how to maximize the utility of these assets and give them the best tools we can." Along with increased speed and accuracy, EXACTO will improve sniper safety by opening a wide range of viable hide locations for sniper

teams. The program aims to achieve all this while maintaining the current two man shooter/observer sniper team and minimizing changes to existing concepts of operations.

The program recently completed its first phase by achieving a successful proof of concept with a high fidelity hardware-in-the-loop (HITL) simulation. Phase II will build and test a complete system, including the required optical sighting equipment and guided .50 caliber projectiles. Although intended for use by snipers, this technology is directly applicable to larger calibers as well as vehicle, ship- and airborne-mounted systems.

DARPA has signed a transaction agreement with Teledyne Scientific and Imaging for Phase II development and demonstration of a complete EXACTO system.



## Army

### UK Army vehicle crew training school opens in Germany



The British Army has opened a new facility in Germany to provide soldiers and marines who are likely to deploy to Afghanistan next year with essential training in how to operate military vehicles as a crew.

The Crew Training School (CTS) based at the British Army's world class training ranges in Sennelager, North Germany, has been established specifically to prepare vehicle crews for Afghanistan. It will initially train troops from 3 Commando Brigade and Germany-based 7th Armoured Brigade before switching to concentrate on 20th Armoured and 19 Light Brigades in the New Year.

The school is unique in that it is the only facility in the British Army which brings together entire crews to prepare them to use their skills in conjunction with each other to operate, maintain and conduct live cover fire from the military vehicles which they will use in theatre.

When crews leave the school they will be able to start their mission specific training as fully qualified vehicle crews.

Administered by the Royal Scots Dragoon Guards, the CTS includes an extensive cross-country training range with deep water crossings, ditches, dirt tracks and slopes to replicate as closely as possible the conditions in Afghanistan.

Captain James Fyvie, who serves with the Royal Scots Dragoon Guards and is second-in-command of the CTS, said:

"This school will be the first opportunity these people will have to work together as a crew - the vehicle

commander, gunner and driver will be taught to hone their respective skills and then use their vehicle just as they will be expected to in Afghanistan.

"It provides an opportunity to develop tactics, manoeuvres and a chance to actually fire weapons from a moving vehicle moving across difficult terrain. The training is comprehensive and develops confidence in the equipment but more importantly the team.

"This is the only facility available to us outside of Afghanistan and with many of the soldiers due to deploy based in Germany it's good to have it here. It means that they will be able to train without the need to spend a long period of time away from their families who are based here in Germany with them - and reduce the cost of travelling without making any compromises on quality."

Over the next year the CTS will train up to 4,000 personnel on vehicles which include the Jackal, Springer, RWMIK Land Rover, Mastiff 2, Ridgback, Vixen, Husky and quad bikes.

More than 100 driving and maintenance instructors and tactical vehicle crew commander instructors are based there and provide five-day packages for crews, drivers and operators.

Captain Fyvie added:

"All troops going through the school are expected to apply the same levels of expertise and maintenance skills which will be required in theatre."

The driver training area was constructed by Royal Engineers from Germany-based 1st (UK) Armoured Division and the Territorial Army. This provided excellent training, allowing them to plan, design, resource and then implement the project. Existing tracks were upgraded in order to provide as challenging and realistic a facility as possible.

During the official opening ceremony Major General Adrian Bradshaw, General Officer Commanding 1st (UK) Armoured Division, said:

"Our troops in Afghanistan are equipped with some of the best vehicles currently available. They are rightly our first priority for equipment, but that leaves us with a complex task of managing the training fleet for collective and specialist individual training.

"This complex task, in conjunction with an extremely busy, wider collective training burden, led to the decision to concentrate this function in a specialist training establishment. This results in a number of benefits ranging from the reduction of nights away from home, maximising the numbers of qualified crews available for collective training, through to increased vehicle availability that comes from pooling our expertise together.

"I am delighted to see the way in which the Royal Scots Dragoon Guards have responded to this task. They have taken their long experience of using armoured fighting vehicles and created a comprehensive training package that allows every student to gain from their experience.

"The establishment of the Crew Training School in Germany makes optimal use of the existing training estate and minimises the requirement to move on public

roads - minimising the disruption to the public and creating more time to concentrate upon training."



**Future Technologies**

**Toro Partners with ATK to Develop Fuel Cell Powered Utility Vehicles**

The Toro Company has been selected by ATK, an aerospace and defense company, to help design and build two fuel cell powered utility vehicles with hydrogen storage technology.

The project is part of a contract awarded to ATK by the Naval Surface Warfare Center Crane Division, which is collaborating with the Defense Logistics Agency (DLA) to coordinate hydrogen storage development efforts for the U.S. Department of Energy.

The fuel cell utility vehicles, powered by a solid hydrogen storage system, are scheduled for delivery later this fall to the DLA for a 12-month operational demonstration. During this time, the vehicles will retrieve and transport materials between warehouses with data being collected to better understand the performance, durability and sustainability of the hydrogen fuel cell system.

Shaped by concerns over energy usage and the environment, the Energy Policy Act of 2005 requires that the U.S. Department of Defense reduce oil consumption rates by 20% before the end of 2015. The energy law also establishes a hydrogen and fuel cell program with a goal of producing commercial fuel cell vehicles and developing hydrogen infrastructure by 2020.



**Contracts**

**General Dynamics Awarded Four-year Ammunition Contract by Spanish Army**

VIENNA -- The Ministry of Defense of Spain has awarded General Dynamics European Land Systems, through its Spanish subsidiary Santa Bárbara Sistemas S.A., a four-year contract for the supply of 5,56x45 mm NATO ammunition for the Spanish Army, Air Force and Navy.

The contract has a maximum potential value of approximately \$20 million (\$27.9 million) if all options are exercised.

The 5,56x45mm ammunition, officially referred to as "5.56 NATO," is the standard ammunition for the armed forces of all NATO members and many other countries around the world. The ammunition will be manufactured in Palencia, in the center of Spain.

With this contract, General Dynamics European Land Systems Santa Barbara Sistemas reaffirms its leadership in Spain as manufacturer of small- and medium-caliber ammunition.



**Defence Industry**

**Oshkosh Defense Hosts U.S. Army Under Secretary Westphal**



OSHKOSH, Wis. -- Oshkosh Defense, a division of Oshkosh Corporation, today welcomed U.S. Army Under Secretary Dr. Joseph Westphal to the company's Wisconsin campus.

During his visit, Dr. Westphal addressed Oshkosh employees, toured the recently completed E-coat facility and drove an Oshkosh MRAP All-Terrain Vehicle (M-ATV) on the company's test and development course.

"The work you do here is critical to the U.S. Army," Dr. Westphal, the Army's second-highest ranking civilian official, said in an address to Oshkosh employees. "I appreciate the opportunity to see your work first-hand, and thank you for your great support of the Army."

Accompanying Dr. Westphal during his visit to the Oshkosh facilities were two U.S. soldiers – 1st Sgt. Mike Leonard and Pfc. Drew Miller – who were wounded in battle.

"It's an honor to welcome Dr. Westphal and these brave soldiers to our facilities to meet our team and experience the innovative work underway to support the Army," said Andy Hove, Oshkosh Corporation executive vice president and president of Oshkosh Defense. "We understand that U.S. soldiers depend on our vehicles and technologies to stay safe and ensure mission success on the battlefield. It's a privilege to work every day to support the men and women serving our country."

During his visit, Dr. Westphal emphasized the importance of the industrial base during these difficult economic times. "The Department of Defense and the U.S. Army are reducing defense spending and looking to industry partners like Oshkosh Defense to reach new levels of efficiency and cost savings."

Dr. Westphal was sworn in as the 30th U.S. Army under secretary in September 2009. He previously served as provost, senior vice president for research and professor of environmental studies at The New School in New York City. Dr. Westphal served as the acting secretary of the Army in 2001 and as the assistant secretary of the Army for Civil Works from 1998 to 2001.

Oshkosh Defense designs and produces a broad range of military vehicles for the U.S. Army – from heavy equipment transporters to high-mobility, protected vehicles. In addition, Oshkosh provides complete

vehicle life-cycle sustainment services including training, parts, supplies and in-theater maintenance support.

The M-ATV, which Oshkosh produces for the Army, Marine Corps, Navy and Air Force, delivers life-saving MRAP-level protection and uses the Oshkosh TAK-4® independent suspension system to overcome severe off-road terrain found in places like Afghanistan.

## Contracts

### BAE Systems Receives New Soldier Equipment Orders Worth \$22 Million from U.S. Army



PHOENIX, Arizona -- BAE Systems has been awarded two contracts valued at more than \$22 million to produce Modular Lightweight Load Carrying Equipment (MOLLE) for the U.S. Army.

The contracts include various MOLLE compatible items, including both large and medium rucksacks, pockets, and pouches in the MultiCam® pattern, as well as medium rucksacks and Tactical Assault Panels (TAP) in universal camouflage.

MOLLE is a fully integrated, modular load carrying system that includes vests, backpacks or "rucksacks" as they're often called, pockets, pouches and hydration systems, all of which are configurable for specific mission requirements. The TAP features an apron-like panel which attaches to the front and sides of a variety of vests, providing soldiers with additional equipment carrying options, as well as the ability to quickly release equipment in emergency situations.

The MOLLE contracts, valued at \$17.9 million and \$4.2 million respectively, are delivery orders issued against an indefinite delivery, indefinite quantity (IDIQ) contract awarded to BAE Systems in August 2006. The most recent awards bring the total, cumulative contract award value to approximately \$199 million.

"MOLLE provides troops with a completely tailorable and modular system of rucks, pockets and pouches which are designed to improve readiness and efficiency" said Greg Kraak, Director of U.S. Military Programs for BAE Systems' Personnel Protection Systems business. "Soldiers deploying to Afghanistan will do so wearing the new Operation Enduring Freedom camouflage pattern (OCP). Also known as MultiCam, OCP provides

Soldiers with the ability to better conceal themselves in various environments, seasons, elevations and light conditions, aiding in their mission effectiveness and survivability."

BAE Systems' Personnel Protection Systems' business manufactures MOLLE equipment. Production began in October at company facilities in McKee, Kentucky and Jessup, Pennsylvania, with final deliveries expected to be completed by January 2011.

BAE Systems is a leading provider of soldier protective and load carriage equipment in the United States, producing a significant portion of the nation's body armor, tactical vests, combat helmets and load carrying systems. Not only is the company focused on the design, development and production of leading edge survivability products, its integration of advanced materials into manufacturing, rigorous product testing, and field trials support the company's focus on the men and women who serve in the armed forces.

## Future Technologies

### Rafael Advanced Defense Systems Ltd

Rafael will unveil the ImiLite ISR Command and Control Exploitation System designed for use by defense forces (air, ground) and police forces exercising various observation means for border patrol or coping with urban crime.

ImiLite is a cost-effective, ISR Command and Control Exploitation System, designed to receive, process and exploit multiple standalone imagery video and other intelligence data in a centralized and unified way

Rafael Advanced Defense Systems Ltd., developer and manufacturer of leading air, sea, and land defense solutions, will unveil the Imilite, a new, multi-sensor, multi-platform intelligence, surveillance, and reconnaissance (ISR) Exploitation System. The unveiling will be made at the Land Warfare Conference (LWC) in Australia in mid-November.

ImiLite is a cost-effective intelligence system designed to receive process and exploit multiple standalone imagery video and other intelligence data in a centralized and a unified way.

Main system capability includes the reception, processing and exploitation of EO, IR, SAR/GMTI and VIDEO, in various formats, over one desktop. In order to enhance the exploitation process, ImiLite further combines non-imagery data such as targets, threats, COMINT detection and mission status within the system workflow. ImiLite generates a variety of standard and customer tailored ISR reports and IMINT products such as alphanumeric reports, annotated maps, GIS data layers and visual aids, and disseminates them to external information and operation systems over standard and tailored protocols.

ImiLite's multi-source data integration and automation capabilities improve the efficiency of utilizing available collection and exploitation assets. The system GIS capabilities provide immediate accessibility to relevant

imagery and intelligence data, thus shortening the ISR collection and exploitation cycle.

The ImiLite is based on Rafael's combat-proven ISR and C4I systems already in service worldwide. ImiLite is designed for use by defense forces (air, ground) and police forces exercising various observation means for border patrol or coping with urban crime.

Haim Jacobovitz, Corporate VP and General Manager of Network-Centric Warfare Sector at Rafael: "ImiLite's advanced ISR exploitation capabilities provide defense and police forces a leading edge in dealing with today's intelligence collection and processing demands. ImiLite joins Rafael's battle-proven C4ISR solutions to complement its vast variety of other advanced defense systems in use by dozens of customers around the world."



## Defence Industry

### New Data Encryption System

AT Electronic and Communication International and ZorSoftKz are pleased to announce the implementation of a unique security solution for the Republic of Kazakhstan government.

As a result of collaboration efforts between the two companies a secure data transfer product with customers' access locked in the Republic of Kazakhstan has been delivered.

The complete solution provides:

- key information generation (key pair);
- data electronic digital signature
- data encryption
- user authentication

Data transfer using the HF communication band based on Codan HF SSB transceivers enables the following cryptographic operations:

- symmetric encryption in compliance with GOST RK 28147-89 in simple exchange mode, stream mode, cipher feedback mode;
- message authentication code calculation in compliance with GOST RK 28147-89
- electronic digital signature calculation and authentication in compliance with GOST 34.310-2004
- generation of data hash value in compliance with GOST 34.311-95, SHA-384
- random sequence output based on pseudo-random number generator
- asymmetric data encryption
- generation of key pairs for electronic digital signature in compliance with GOST R 34.10-2001 based on prepared elliptic curve and curve reference point
- generation of key pairs for asymmetric encryption based on prepared elliptic curve and curve reference point
- generation of basic parameters for pseudo-random number generator



## Defence Industry

### Peacekeeping impasse risks Africa`s wider stability

Ill-equipped and ill-trained African peacekeeping forces are at best only able to contain ever increasing security challenges in conflict areas in Africa, leaving the wider region at risk of growing instability and economic decline, according to one of the continent`s leading industrialists.

Ivor Ichikowitz – whose company Paramount Group provides peacekeeping solutions, equipment and training to defence forces across the continent – has called for a new solution to peacekeeping, with Africa's defence industry and governments cooperating to establish Africa as a centre for peacekeeping excellence in a bid to effectively resolve conflicts and stimulate good governance, industrial development and economic growth.

His comments come as UN Secretary General Ban Ki-Moon called for greater support for African Union troops serving in Somalia and argued that AU troops should receive the same support as UN personnel. During a recent special UN Security Council debate on the war in Somalia African states also raised their complaints about its troops getting poorer treatment than those on mainstream UN missions.

Mr Ichikowitz made his observations to coincide with the African Security and Advanced Technology Summit which started in Nairobi today, where Paramount Group is the main sponsor.

He said: "We support the call by the UN Secretary General for African peacekeeping missions to receive the same level of support as western missions. I urge the global defence industry to support his call.

"African peacekeepers are deployed in some of the most dangerous environments, such as Somalia and Darfur. It is unacceptable to commit them to such dangerous and complex missions without full training, logistical support and equipment – which I fear is the current situation.

"This must change, but that will require a new approach to peacekeeping and security.

"African nations need to start working together more closely on security policy and pooling their resources. We need to turn peacekeeping into a continental project where states co-ordinate, procure and manufacture equipment locally in order to address regional security threats.

"This approach will be more financially manageable and will also foster multilateral co-operation, support local economies and provide greater capacity for independent AU operations.

"Most importantly, this isn't a pipedream. Africa already has the technology, the skills and the production capacity to deliver world-class peacekeeping solutions that meet every requirement of modern and professional peacekeeping forces. We don't need to look outside Africa for this capability, we already have it right here. We have a home-grown solution that is affordable for

African states and perfectly aligned to their immediate and long-term needs. “

The African Security and Advanced Technology Summit brings together leading governments, the United Nations, industry and think tanks to deliberate on the future of African Security.

Mr Ichikowitz continued: “The Paramount Group is a technology asset for Africa and we are keen to share our innovations in the areas of industrial development, armoured vehicle technology, personnel training and innovative financing to build the capacity that is required to meet the peacekeeping needs of Africa.

“The time is right to adopt this approach and actively pursue the development of a world-leading peacekeeping competence and all its associated benefits including technology transfer, job creation and skills and economic development.”

He concluded: “If Africa is to enter a new era of peace, stability and development then it must address threats to instability head on. If this doesn't happen, if we continue to rely on outsiders, then terrorism, uncontrolled migration and civil war will continue to destabilize Africa, undermining the good governance, institution building and economic development that is crucial to our peaceful future. This new approach can break the current impasse in peacekeeping.”

### Defence Industry

#### Lockheed Martin Announces Industry Team for U.S. Army CIRCUM Program

ORLANDO, FL -- Lockheed Martin [NYSE: LMT] Missiles and Fire Control, DRS Technologies and Daylight Solutions announced today that they are partnering to address the U.S. Army's Common Infrared Countermeasure (CIRCUM) Technical Development requirement.

The CIRCUM program will provide laser defeat capability to rotary-wing aircraft operating in close terrain flying missions where man portable air defense systems represent a significant threat.

"Lockheed Martin has assembled a solid industry team to architect the next generation in rotary-wing survivability," said Matt Milligan, Platform Survivability Program director at Lockheed Martin Missiles and Fire Control. "Our team offers advanced technology to attack the CIRCUM program's critical survivability requirements, while keeping in mind affordability and minimized size, weight and power."

Lockheed Martin's CIRCUM solution is a lightweight laser defeat system that incorporates a pointer tracker and commercial off-the-shelf processor and quantum cascade laser. It has been successfully integrated with the existing Common Missile Warning System and is compatible with next-generation missile warning systems.

The system's compact, streamlined design and modular open system architecture make it adaptable to a wide range of rotary-wing platforms and expandable to new threats and missions. CIRCUM platforms will include

the U.S. Army AH-64, UH-60 and CH-47 rotary-wing aircraft.

DRS Technologies' Reconnaissance, Surveillance and Target Acquisition business group is an experienced provider of advanced electro-optic infrared technology and is leveraging previous expertise with Distributed IRCM towards this team's CIRCUM solution.

Daylight Solutions has developed and demonstrated quantum cascade laser (QCL) technology for Defense and Security applications. Daylight has integrated its QCL technology into their JammIR product line, resulting in lightweight, military-hardened multi-wavelength laser systems that have performed successfully in distributed infrared countermeasure applications.

In order to deliver an affordable, multi-service solution for IRCM, Lockheed Martin is leveraging more than 30 years of experience in infrared missile warning system development and production, as well as experience in laser pointer/tracker technology. On programs such as Arrowhead, Sniper Advanced Targeting Pod and the F-35 Electro-Optical Targeting System, Lockheed Martin focuses on delivering reliable, affordable solutions to meet Warfighters' needs.

### Exhibitions

#### Oshkosh Corporation Puts Concept Vehicle to the Test in the 43rd Annual Tecate SCORE Baja 1000



OSHKOSH, Wis. -- Oshkosh Corporation announced today its first participation in the 43rd Annual Tecate SCORE Baja 1000 off-road race Nov. 18-20 in Mexico. The Oshkosh Extreme Racing team will run its Light Concept Vehicles (LCV) through the rugged 1,061-mile desert course from Ensenada to La Paz.

Oshkosh engineers have designed the LCV to incorporate the company's latest advancements in off-road suspension and diesel-electric powertrain performance. The Oshkosh Extreme Racing team will be racing two vehicles in the Tecate SCORE Baja 1000 as part of its rigorous testing protocol.

“Oshkosh engineers are dedicated to producing the most advanced vehicle technologies for a variety of highly-specialized industries,” said Chris Yakes, Oshkosh Corporation vice president of Advanced Products Engineering and Oshkosh Extreme Racing team member. “In pursuit of next-generation technologies for future fleets, we've been testing our concept vehicles in



remote locations in the United States, and we are now competing in the Tecate SCORE Baja 1000 – our most intense challenge to date. We are excited about this opportunity.”

The LCV includes the next-generation of TAK-4® independent suspension systems. The new system expands on the Oshkosh patented TAK-4 suspension by increasing off-road mobility, improving vehicle maneuverability and providing a smoother ride. The Oshkosh ProPulse® diesel-electric powertrain design delivers improved fuel economy and can export significant levels of electrical power.

“Oshkosh got its start as a developer of severe-duty four-wheel drive trucks, so it is only fitting that it competes its latest concept vehicle in the most extreme off-road race – the Tecate SCORE Baja 1000,” said Sal Fish, SCORE International’s president and CEO, which has sanctioned and produced the event since 1975. “We’ve created a new class for the Oshkosh Extreme Racing Team based on their vehicle’s unique capabilities, weight and dimensions, and look forward to seeing it perform.”

The two Oshkosh Extreme Racing vehicles, numbered M1 and M2 for the race, will be driven by members of California Gold Racing (CGR), led by legendary race mogul Glenn Harris. As a member of the Oshkosh Extreme Racing team, CGR will also provide logistics support, while Oshkosh engineers will manage the pit crews and technical support for the race.

“We’re looking forward to the race and its inherent ability to push our team and the vehicle technologies we’ve developed,” Yakes said. “We expect to learn a lot from this event and will apply those learnings to our ongoing research and development efforts.”

#### **About the Tecate SCORE Baja 1000**

The 43rd Annual Tecate SCORE Baja 1000, the granddaddy of all desert races, which is the season-finale of the five-race 2010 SCORE Desert Series will be held on Mexico’s magnificently mysterious Baja California peninsula next Tuesday through Saturday. Massive crowds reaching nearly 250,000 are anticipated to again be spread out along the rugged 1061.69-mile course that travels on both sides of the peninsula as the world’s most famous desert race will start in Ensenada, Baja California and finish all the way down the peninsula in La Paz in Baja California Sur. With over 300 expected entries for cars, trucks, motorcycles and ATVs competing in 33 Pro and 7 Sportsman classes for cars, trucks, motorcycles and ATVs in the internationally televised race, entries have come from 37 U.S. states and 19 countries. SCORE International, the world’s foremost desert-racing sanctioning body, is headquartered in Los Angeles. It was founded in 1973 and has been led since soon after that date by Sal Fish, SCORE CEO and President. The organization produces the five-race SCORE Desert Series, with three events held annually in Mexico and two in Southern Nevada.

## **Contracts**

### **Ceradyne Receives \$56.3 Million ESAPI Body Armor Order**



Costa Mesa, Calif. -- Ceradyne, Inc. announced that it has received a delivery order for approximately \$56.3 million for ESAPI (Enhanced Small Arms Protective Insert) ceramic body armor plates.

Ceradyne will begin shipping this ESAPI production release late this year with full shipment expected to be completed late in first quarter 2011.

The release was issued under the \$2.37 billion ID/IQ (Indefinite Delivery / Indefinite Quantity) contract originally issued in October 2008 and scheduled to expire in September 2013. There is a balance of approximately \$2.1 billion remaining on the ID/IQ contract. Ceradyne’s practice is to only book firm delivery orders such as the above \$56.3 million as backlog for scheduled delivery.

David P. Reed, Ceradyne President, North American Operations, commented: “We are extremely pleased to have been awarded this ESAPI contract. We anticipate meeting the government’s quality and delivery requirements with this delivery order shipped complete in Q1 2011.”



## **Training And Simulators**

### **Norway Selects KMW Training & Simulation to deliver its BATSIM Classroom for LEOPARD 2**



Munich -- German KMW Training & Simulation has been selected by the Norwegian Armed Forces to deliver the BATSIM Classroom for the main battle tank LEOPARD 2.

The BATSIM Classroom provides state of the art combat training on serious games level and offers maximum of realism. The system runs on commercial-off-the-shelf (COTS) desktop computers. KMW Training & Simulation will deliver the BATSIM

Classroom simulators to the Norwegian Armed Forces in 2011.

Like many armies worldwide, the Norwegian Armed Forces have explored the use of serious games to support their training activities. In the past, these applications largely failed to simulate realistic vulnerability and damage models, and also lacked the sophistication to reproduce the vehicles' operational details.

### **BATSIM Classroom is a milestone in military simulation**

Driven by KMW's unique knowledge - deriving from over 30 years of development into high-end combat simulation - and the quantum leap of commercial computer and graphic board development, KMW Training & Simulation has condensed its combat simulation software to fit and run on a single COTS Desktop PC. As a result, it will be available to an even larger number of trainees.

As Dr. Dirk Schmidt, Senior Vice President Training & Simulation for KMW, commented "This is a milestone in military simulation because with the BATSIM Classroom a desktop simulation system is available which combines KMW's expertise as a leading manufacturer of main battle tanks and of a proven simulation framework fielded in many armies worldwide. Our customers will appreciate the plug and play networking of our new BATSIM Classroom with their existing high-end simulators". The BATSIM Classroom for LEOPARD 2 has been developed in close cooperation with experienced tank training experts to match their exact requirements.

- Integrated IMI: KMW's powerful man machine interface for instructors and trainees
- Instructor Independent Training: Trainee management and Automated exercise progress
- Computer Generated Forces: Very flexible and intelligent CGF suitable for MOUT operations
- MilCIG: KMW's world class COTS visual system running on standard PC, license free from 3rd party suppliers
- Dynamic Database in proven KMW quality and fidelity
- Dynamic Objects in high detail and large variety
- Networking with other simulation systems from KMW, e.g. for full mission training, or other simulators supporting the DIS/HLA interface.

The training environment is tailored for the MBT LEOPARD 2 with physical replication of important control elements and validated vehicle dynamics, vehicle logic and simulation of fire control system, but can easily be adapted to other combat vehicles, from all vendors.

Krauss-Maffei Wegmann GmbH & Co. KG provides further information of BATSIM Classroom for LEOPARD 2 at I/ITSEC 2010, the world's largest modeling, simulation & training conference (November 29th - December 2nd) in Orlando, USA (Booth #1209).

## **Defence Industry**

### **BAE Systems - Navistar Defense - ArvinMeritor Team Delivers Enhanced Protection Joint Light Tactical Vehicle Prototype**



STERLING HEIGHTS, Michigan -- BAE Systems along with partners ArvinMeritor and Navistar Defense have delivered an Enhanced Protection configuration of the Joint Light Tactical Vehicle (JLTV) prototype to the U.S. Army and U.S. Marine Corps.

"The military looks to JLTV to provide the improvements in protection, performance, and payload needed to fill the capability gaps between the HMMWV and MRAP families of vehicles," said Ann Hoholick, vice president and general manager of New Vehicles and Amphibious Systems for BAE Systems' U.S. Combat Systems. "This vehicle is similar to the three Category A prototypes that were delivered earlier this year and has been further improved to allow for enhanced and scalable survivability without sacrificing essential expeditionary capabilities."

The team met this challenge by leveraging years of armor design and development experience, along with the innovative blast mitigation techniques that have been matured on BAE Systems' Mine Resistant Armored Protection (MRAP) family of vehicles.

"The advanced design and engineering of the Meritor ProTec Series 30 High Mobility Independent Suspension will provide advanced protection, mobility and ride quality for the JLTV platform," said Tim Burns, vice president of Defense and Specialty for ArvinMeritor.

This is the final prototype that the team will deliver during the 27-month technology development phase, which is expected to conclude in May 2011. The prototype vehicles will undergo continued government testing over the next several months to aid in the finalization of the requirements for the Engineering and Manufacturing Development phase of the program.

## **Defence Industry**

### **CV90 and RG41 Offer Insight Into Future of Australian Land Combat Systems**

BRISBANE, Australia -- BAE Systems has outlined its vision for the future of the Land 400 program by revealing details of two armoured combat vehicles that would deliver superior survivability, mobility and sustainability to Australian warfighters.

The company is using the 2010 Australian Land

Warfare Conference to discuss its tracked CV90 MkIII Armadillo and wheeled RG41 vehicles that could form the core of the Australian Defence Force's future land combat force.

These vehicles represent the latest examples of the best of BAE Systems' global experience, skills and technology in developing proven armoured fighting vehicles, according to Land & Integrated Systems Director Kim Scott.

Mr Scott said BAE Systems recently responded to an Australian Government invitation to register interest in Land 400 by providing details of more than 10 vehicles that could potentially fulfil the multiple roles required by the ADF.

"For example, the experience gained in delivering 1,110 CV90 Infantry Fighting Vehicles to six of the most technically sophisticated of the world's armies has been incorporated into the new Armadillo."

"As a tracked armoured vehicle, the Armadillo balances extremely high protection, high mobility, and high payload. Internally, it is equipped to accommodate and integrate the digitally equipped infantry of the future."

An important feature of the Armadillo is component commonality and modularity across the turreted, personnel carrier and engineering variants, achieving 65 per cent to 88 per cent commonality.

This is a major contributor to the low logistic footprint, aimed at minimising the total cost-of-ownership. With available payload provision of 16 tonnes, the designers have also achieved a modular tracked vehicle and a flexible family of role variants.

The RG41 is the latest in a line of armoured combat vehicles that draws on BAE Systems' experience as one of the world's most prolific providers of armoured protection systems over the past 40 years.

Mr Scott said: "Our company's global experience in protecting soldiers against IEDs, mines, rocket, and ballistic threats has been incorporated into the RG-41. The RG41 provides a tough, secure and versatile solution for the wheeled element of Land 400."

Vehicle weight is up to 30 tonnes, including a high payload capacity of 11 tonnes. It can accommodate 11, including driver, vehicle commander and nine soldiers.

Affordability is a leading consideration driving the procurement of wheeled protected vehicles — so the RG41 is based on COTS and MOTS components, minimising the use of specialised items.

Another innovative feature is the modular, field-repairable, mine-protected design on the vehicle's underside, achieved by the use of bolt-on blast modules.

"Through the Land 400 project, the ADF is seeking to re-equip its land combat forces with a range of systems that are more survivable, capable and interoperable.

"BAE Systems is the only global military vehicle manufacturer with the capability to provide the complete range of vehicles today that could meet the ADF's diverse and demanding future requirements," Mr Scott said.

## Tactical Intercom System



AT Communication is pleased to announce the new enhanced Tactical Intercom System. The Tactical Intercom System is made up of 6 main modules that provide the building blocks to a scalable system.

The 6 modules are:

- Base Unit
- Master Control Unit
- Radio Access Unit
- Intercom User Unit
- Personal Wireless Communicator
- Power Supply Unit

The modules can be configured in a variety of flexible configurations to provide solutions for a wide variety of mobile intercom requirements, e.g. Military, Emergency Services, Humanitarian Aid and Paramilitary.

Using military grade design principles the modules are built to withstand the harshest conditions found in tracked artillery vehicles and due to the compact design are equally deployable in smaller emergency support vehicles.

The system can be deployed as a fixed wired solution or as a combination of wired and wireless system to provide dismounted crew communications back to the host platform.

Wireless communication is protected using high-grade encryption and ECCM. The system can interface with tactical radio transceivers to provide longer haul communications from the mobile platform. The advanced system architecture allows direct control of the transceivers providing installation flexibility where the radios do not need to be in direct reach of the operators.

Due to the scalability of the system it can accommodate between 2 to 20 users that are wired in to the platform with a further expansion to 4 wireless users with control for up to 4 tactical radio transceivers. Advanced radio functionality is able to be remote controlled via the easy to use display and menu system that is compatible with Night Vision systems.

### Key Features of the AT Tactical Intercom System

- Scalable between 2-24 users depending on module configuration
- Support for advanced remote control of up to 4

tactical radio transceivers from most vendors with data interface

- Full duplex communication for wired and Personal Wireless Communicator intercom stations and semi-duplex for tactical radio transceivers
- Compact military grade design, easy to maintain with familiar user interface
- User friendly user interface similar to mobile phones
- Night Vision Goggle (NVG) Compatible display
- Radio frequency suppression circuitry to reduce effects of high power radio transmissions
- Compatible with most helmet/headset/throat microphone and earpiece combinations
- Wireless Personal Communicator has A range of visual and audible indicators for battery, range limit, signal strength
- Covert mode
- Secure communication using high grade encryption and ECCM techniques

The AT Communication Tactical Intercom System is one of the most advanced configurable systems available for defence users offering a combination of Wired/Wireless and advanced transceiver remote control capability. Enquiries are welcome from end user organisations such as defence, emergency services, paramilitary and humanitarian aid, radio transceiver manufacturers, vehicular platform manufacturers, systems integrators and dealer representatives.



### Defence Industry

## Rheinmetall Defence and Kongsberg have signed a framework agreement

The scope of this agreement is to provide a framework for the cooperation between the companies for the Remote Weapon Station product area.

Through this agreement the companies intend to not only maintain, but also to expand the co-operation as well as establish joint sales efforts in some international markets.

Rheinmetall and Kongsberg have entered into this cooperation agreement to promote the Kongsberg Protector family of RWSs and also increase the level of integration between the two company's product lines. The overall objective of bringing the two high technology companies together is to offer leading-edge

solutions and to raise the value for our international customers.



### Defence Industry

## Fast delivery – Norwegian DINGO 2 to Afghanistan three weeks after order



Only three weeks after the order agreement between the Norwegian Army and Krauss-Maffei Wegmann (KMW) on October 29th this year, the first ten of 20 DINGO 2 heavily armoured vehicles have been delivered to a delegation of the Norwegian Armed Forces in Munich (Germany) under the lead of Major General Trond R. Karlsen, the head of the Norwegian Procurement Agency NDLO.

The vehicles are now on their way to Afghanistan, where KMW service personell will make them operational for theatre. Parallel to the production of the vehicles Norwegian soldiers were trained by KMW in maintaining and operating the DINGO 2.

Thus KMW demonstrates once again its ability for quick and reliable delivery and its worldknown contribution to the protection of soldiers on the ground. "We are proud to work with such a remarkably professional and challenging customer as the Norwegian Army. They have selected the best protected vehicle in its class.



### Defence Industry

## Navistar Defense to Provide 250 MaxxPro MRAP Recovery Vehicles



WARRENVILLE, Ill. -- Navistar Defense, LLC today announced that it received a delivery order for 250 International® MaxxPro® Recovery vehicles from the U.S. Marine Corps Systems Command.

The \$253 million order was placed under the company's Mine Resistant Ambush Protected (MRAP) indefinite delivery / indefinite quantity contract and includes contractor logistics support. This is Navistar's eighth major MRAP variant.

Navistar originally unveiled the MaxxPro Recovery vehicle, also known as a wrecker variant, in February 2009 as a new utility vehicle offering.

"We believe that part of industry's role is to recognize a potential need before it becomes an absolute

necessity,” said Archie Massicotte, president, Navistar Defense. For Navistar, that meant extending MRAP-level survivability to those running vehicle recovery and other support missions.”

Just last month, Navistar expanded its MRAP family of vehicles again with the launch of the MaxxPro Tractor and MaxxPro Dash Ambulance. The company’s ability to grow its vehicle portfolio, with little lead time, occurs through the use of the existing commercial vehicle platforms.

The MaxxPro Recovery vehicle is based on the same International® WorkStar® platform that lends its flexibility to the company’s growing family of vehicles. MRAP ballistic, mine and improvised explosive device (IED) protection will now aid two- to three-man crews as they retrieve damaged or mission-disabled vehicles and carry out other support missions.

The vehicle is powered by the MaxxForce® 9.3D engine. Production of MaxxPro Recovery units will be completed by fall 2011.

Since receiving its original MaxxPro MRAP contract in May 2007, Navistar has emerged as one of the leading providers of MRAP vehicles. To date, the company has been contracted to produce more than 7,800 units.

“Winning orders like this is consistent with our plans to be a \$1.5 to \$2 billion annual business,” said Massicotte. “Not only do we have flexible vehicle platforms at the ready, but we have a growing network of engineers along with strong parts and sustainment organizations to keep us on target.”



### Contracts

## Oshkosh Defense to Supply More Than 4,700 FMTV Trucks and Trailers to the U.S. Army



OSHKOSH -- Oshkosh Defense, a division of Oshkosh Corporation, will supply more than 4,700 Family of Medium Tactical Vehicles (FMTV) trucks and trailers to the U.S. Army under a new delivery order from the Army TACOM Life Cycle Management Command (LCMC).

The FMTV supports Army and National Guard units at home and abroad in combat operations, relief efforts, unit resupply missions and other functions.

“We are eager to fill this new order and continue to drive Oshkosh FMTVs off the production lines and into the field,” said Mike Ivy, vice president and general manager of Army Programs for Oshkosh Defense. “Whether used domestically, on the battlefield or

elsewhere around the world, the FMTV’s many variants are integral to keeping supply chains moving for Army missions.”

This order is part of a five-year FMTV contract awarded to Oshkosh Defense for the production of the Army’s medium vehicle fleet, as well as support services and training, through fiscal 2013. The order brings total FMTV orders to date to more than 14,000 trucks and trailers.

The Army’s delivery order includes more than 4,150 trucks and 590 trailers. Deliveries are scheduled to begin in September 2011 and finish in August 2012. The order is valued at more than \$797 million.

The FMTV is a series of 17 models ranging from 2.5-ton to 10-ton payloads. Vehicles feature a parts commonality of more than 80 percent, resulting in streamlined maintenance, training, sustainment and overall cost efficiency for the U.S. Army.



### Defence Industry

## Futuristic artillery gun is cited as the world’s fastest firearm



With the ability to fire 16,000 rounds of ammunition each second, the Metal Storm Stacked Projectile is one of the most fearsome military weapons in development.

### World’s Fastest Firing Weapon

Firing one million rounds of ammunition per minute has earned the Metal Storm Stacked Projectile a citation in the Guinness Book of Records as the world’s fastest firearm. The Metal Storm device was conceived by James Michael O’Dwyer, an Australian inventor. The weapon is now being developed by Metal Storm Ltd., a research and development company based in Brisbane, Australia that has a subsidiary in Arlington, Virginia.

The Metal Storm Stacked Projectile combines the barrel and magazine, and eliminates the need for a traditional firing mechanism. When the weapon’s trigger is pulled electronic impulses are sent directly to the bullets, which ignite them at an incredibly fast rate of 16,000 rounds a second. The bullets are fired from several barrels at once. This is essentially the same design as a "Roman Candle" firework. Metal Storm also has the ability to fire grenades at a rate of a half-a-million rounds per minute.

### Motion Detection System

Adding to the Metal Storm weapon’s deadly power is the fact that it can operate autonomously using an advanced motion detection system. Metal Storm can be left unattended on a battlefield to detect enemy soldiers or vehicles passing by and then open fire on them. Military analysts claim that the Metal Storm Stacked Projectile could be used against tough vehicles such as

tanks and armoured personnel carriers. The weapon has been featured on television programs on the BBC and Discovery Channel.

Despite the attention being paid to the Metal Storm Stacked Projectile, it remains a weapon that is under development. Issues have also been raised about the ethics of using such a lethal weapon on modern battlefields.



## Defence Industry

### Valanx Unveiled In Australia



BRISBANE, Australia -- The `Valanx`, BAE Systems` solution to meet the Australian Protected Mobility Vehicle – Light (PMV-L) and the US Joint Light Tactical Vehicle (JLTV) program requirements was publicly unveiled for the first time in Australia today.

The Valanx, being offered to the Australian Defence Force under Project Land 121-Phase 4, is the centrepiece of the BAE Systems stand at the 2010 Land Warfare Conference in Brisbane.

Valanx is the result of four successive generations of demonstrator and prototype vehicles developed by BAE Systems.

The JLTV and PMV-L programs will replace much of the Humvee fleet in the US and the Land Rover Perentie vehicle in Australia respectively.

Director of Land and Integrated Systems Kim Scott said: "We believe the Valanx offers the Australian Army the safest and most capable vehicle.

"It's built for the modern warfighter and delivers on the demanding balance required for the 'Iron Triangle' of payload, performance and protection."

BAE Systems, along with partners Navistar Defense and Arvin Meritor, delivered three right-hand drive configured Valanx vehicles to the Australian Army in June 2010.

The Valanx vehicles and trailer have been undergoing trials at Army's test track in Monegeetta, Victoria since mid-2010, as part of the US Government's JLTV program.

In December, these vehicles will revert to Australian control for further evaluation against the Australian trials and evaluation program.

Local Field Service Representatives from BAE Systems Australia have been providing support for the vehicles at Monegeetta throughout the trials program.

Currently, the majority of Valanx's components are at Technology Readiness Level (TRL) 7, which is used to measure equipment maturity.

Mr Scott said the Australian vehicles were designed to be highly compatible with the US variants, ensuring interoperability between forces, while still being tightly tailored to meet the needs of Australian vehicle crews and commanders.

"At present, the US and Australian teams within BAE Systems are working together to examine candidate components and subsystems to enable Australian SMEs to participate in the global supply chain for the Valanx, should we be successful in the 50,000-60,000 vehicle JLTV program.

"This would provide 10-15 years of steady production for companies if selected."

The name Valanx is derived from the meaning of a phalanx – an ancient Greek formation designed to protect soldiers in combat – but introduces the "V" characteristic.

The Valanx has a signature V-shaped hull, designed to deflect a mine blast away from the vehicle, protecting the soldiers inside.

A media briefing about BAE Systems' Valanx will be held at the company's stand A11 at the Land Warfare Conference, from 2pm-3pm on Wednesday 17 November.

Learn more about the Valanx program at <http://www.thevalanx.com>



## Future Technologies

### The Joint-Venture Company Will Commercialize Q-Flo's Carbon Nanotube Fibre to Enhance Composite Armor

SASA, Israel -- Plasan, a global leader in survivability and combat-proven armor solutions and Q-Flo, University of Cambridge spin-out company, yesterday announced the formation of TorTech Nano Fibres Ltd, a joint venture between the two companies.

TorTech, based in Israel, will produce carbon nanotube fiber for the enhancement of body armor and composite armor systems for vehicles. The new material is stronger than Kevlar and other ballistic fabrics, but still flexible and lightweight.

Q-Flo's CEO, Dr. Dai Hayward, commented: "We are delighted to partner with Plasan to further develop the world leading research by Prof. Alan Windle and Dr. Martin Pick, initially within the Department of Materials Science at Cambridge University and for the last 4 years in Q-Flo. Through Tortech, we intend to produce a carbon nanotube-based yarn, which can be woven into the strongest-ever manmade material. Plasan's expertise will then enable the design and production of a revolutionary new range of body and vehicle armor."

CEO of Plasan Group, Dan Ziv, said: "Nano fiber with mechanical properties as carbon nanotube fiber could lead to a breakthrough in structural composites and light weight armor applications. This is an exciting venture since we believe Q-Flo's carbon nanotubes have the potential to revolutionize the defense industry through a

new range of lightweight, flexible and incredibly strong armored material."

Plasan will have exclusive sales and marketing rights to defense-orientated materials, whilst Q-Flo will retain rights for other potential applications.



### Defence Industry

#### Cubic Awarded \$30 Million Follow-On Contract

California -- Cubic Defense Applications, the defense systems segment of Cubic Corporation, has been awarded a follow-on contract worth more than \$30 million for support work at two British Army training areas in Canada and England.

The three-year contract, signed in late September, is for maintenance and operation of Area Weapons Effects Simulator (AWES) systems at the British Army Training Unit Suffield (BATUS), in the Canadian province of Alberta, and at the Defence Training Estate Salisbury Plain (DTE SP), in the county of Wiltshire in southern England. About 30 Cubic employees work in support roles at each location.

AWES and its integrated Tactical Engagement Simulation (TES) system simulates large-scale force-on-force combat exercises, including the effects of direct fire, artillery, mortar fire, mines and air-delivered munitions as well as nuclear, biological and chemical weapons. AWES also tracks and monitors the actions and positions of more than 1,200 individual soldiers and 250 vehicles using GPS technology, records "hits," "kills" and "misses" of small-arms fire with Cubic's Multiple Integrated Laser Engagement System (MILES) technology, and recreates combat exercises for post-mission analysis.

Cubic developed and installed the AWES systems under contracts awarded in 1998. Installation work was completed at the 150-square mile Salisbury Plain training area in late 2002 and the following year at BATUS, a sprawling 1,100-square-mile training area that the British Army leases from the Canadian government for combat exercises.



### Defence Industry

#### General Dynamics Awarded \$95 Million by U.S. Army for Bradley Fighting Vehicle Reactive Armor

CHARLOTTE, N.C. -- General Dynamics Armament and Technical Products has been awarded a \$94.6 million contract by the U.S. Army to produce reactive armor tiles for 440 Bradley Fighting Vehicles.

Deliveries are expected to begin in early 2011 and be completed by summer 2012. General Dynamics Armament and Technical Products is a business unit of General Dynamics (NYSE: GD).

General Dynamics' reactive armor system is

comprised of tiles that fasten to the exterior of the Bradley Fighting Vehicle, allowing it to better withstand direct hits from a variety of anti-armor munitions.

The U.S. Army Contracting Command in Picatinny Arsenal, N.J., awarded the contract in August 2010. Work will be performed at the General Dynamics' facility in McHenry, Miss., and program management will be performed in Burlington, Vt. As a strategic partner, Rafael Advanced Defense Systems Ltd., Ordnance and Protection Division, will share the production workload in Haifa, Israel. The company has produced reactive armor tiles for the Bradley Fighting Vehicle since 1996.

"Our reactive armor tiles are light-weight and provide an increased level of equipment and troop protection against shaped-charge and improvised threats," said Russ Klein, vice president and general manager of weapon systems for General Dynamics Armament and Technical Products.



### Contracts

#### Patria signed the final subcontract for the supply of it's Nemo Mortar System



Patria Nemo 120 mm mortar system has been selected as one of the weapon systems for LAV II vehicles delivered by General Dynamics Land Systems - Canada as part of a Foreign Military Sales (FMS) project for the US Government.

Patria and Mecar S.A. from Belgium signed a letter subcontract for the supply of Patria Nemo systems on 16 June, 2010. The final subcontract was signed on 18 Nov, 2010.

According to the subcontract Patria will deliver 36 Nemo mortar systems as part of US FMS program.

Patria is the global market leader in turreted mortar systems. Patria Nemo is a 120 mm remote controlled mortar turret, offering excellent signature management and ballistic protection as well as providing both direct and indirect fire support. Patria Nemo system has been earlier selected by the Slovenian Armed Forces and the United Arab Emirates Navy.

Patria is a defence, security and aerospace group with international operations delivering its customers competitive solutions based on own specialist know-how and partnerships. Patria is owned by the State of Finland

and the European Aeronautic Defence and Space  
Company EADS N.V.

