

# Army Guide monthly



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## Robots

**Weaponized UGVs are Aiming at the Battlefield**

Milrem, the Estonian defence solutions provider and ST Kinetics, one of Asia's leading land systems companies, came one step closer to helping support or replace soldiers on the battlefield with robots in November when they successfully tested the first weaponized fully modular unmanned ground vehicle, the THeMIS ADDER.

With the aim to minimize human casualties and support existing ground troops, the two companies have been jointly developing a weaponized unmanned vehicle for some time now. During November however, with the cooperation and supervision of the Estonian Defence Forces first live fire test of the vehicle were conducted.

"The tests were intended to test the stability of our platform and see how the remote weapon station and vehicle communicate and work with each other," explained Kuldar Väärasi, CEO of Milrem. "To our satisfaction everything worked perfectly, you can see as much from the video," he added.

The THeMIS ADDER was equipped with a CIS 50MG. However the system can be outfitted with smaller and larger caliber weapons as well.

"Estonians have proved many times before that we can successfully be on the forefront of innovation and the Milrem unmanned ground vehicle is a great example of that innovation when it comes to new technologies in the military field," said Lieutenant General Riho Terras, Commander of the Estonian Defence Forces. "THeMIS ADDER has great potential to put Estonia on the map of countries that provide new technologies and solutions to the modern battlefield," Terras added.

The THeMIS ADDER features the first fully modular hybrid unmanned ground vehicle in the world the THeMIS and the remote weapon station ADDER from ST Kinetics.

The THeMIS has a payload of 750-1000 kg, speed of 24km/h and up to 10h operation time. In addition to being a machine gun on tracks the vehicle can be used for a wide variety of applications, including remote reconnaissance platform, C-IED (Counter Improvised Explosive Device) platform, medevac vehicle and supply delivery device.



## Defence Industry

**BAE Systems rolls out first Armored Multi-Purpose Vehicle**

The AMPV provides the Army with enhanced mobility, survivability, force protection, and combat superiority.

"The AMPV prototype vehicles are the result of a highly collaborative relationship between the Army and our industry team," said Beach Day, program director for AMPV at BAE Systems Combat Vehicles. "Through this relationship, we have been able to design a vehicle that provides a modern, robust solution that meets the needs of today's soldier and of the future force."

The AMPV is a fully modern, highly flexible vehicle that includes five variants and is designed to replace the Vietnam War-era M113 family of vehicles. It is a mature, cost-effective solution that leverages proven Bradley Infantry Fighting Vehicle and M109A7 Self-Propelled Howitzer designs. It meets the Army's force protection and all-terrain mobility requirements that enable the AMPV to maneuver with the rest of the Armored Brigade Combat Team (ABCT). Maximizing commonality within the ABCT reduces developmental risk and provides significant cost savings to the Army.

In December 2014, BAE Systems was awarded a contract worth up to \$1.2 billion from the Army for the Engineering, Manufacturing, and Development (EMD) and Low-Rate Initial Production (LRIP) phases of the AMPV program. The initial award of \$383 million, under the EMD phase, is for development and production of 29 vehicles across all of the variants: general purpose, mission command, mortar carrier, medical evacuation, and medical treatment.

Today's ceremony commemorated the rollout of the first of the general purpose variant. Deliveries of the prototype vehicles will continue into 2017, and developmental testing will run through 2018.



## Defence Industry

**1st ACV 1.1 Roll Out to USMC**

BAE Systems rolled out the first of 16 Amphibious Combat Vehicle (ACV) 1.1 prototypes to the U.S. Marine Corps in a ceremony today at the company's York, Pennsylvania facility.

BAE Systems' ACV 1.1 offering is a fully amphibious, ship-launchable and ship-recoverable 8x8 wheeled combat vehicle.

"BAE Systems has a long-standing legacy of supporting the Marine Corps' amphibious mission," said John Swift, the company's director for the ACV 1.1 program. "That expertise, coupled with the hard work of our dedicated ACV team, has allowed us to deliver the first of these vehicles ahead of schedule."

BAE Systems' solution for ACV 1.1 leverages an existing platform provided by Iveco Defence Vehicles. It is highly effective at sea when compared to any other amphibious vehicle in production today, providing superior land mobility and state-of-the-art systems survivability.

"As the Marine Corps begins testing we are confident that the capabilities of these vehicles will be proven," Swift said.

The BAE Systems solution balances the Marine Corps' demands for an affordable, production-ready platform with added designs for increased force protection, water and land mobility, lethality, transportability, and survivability.

BAE Systems' ACV 1.1 is equipped with a robust 700HP engine, providing a significant power increase over the Assault Amphibious Vehicle currently operated by the Marine Corps. The vehicle excels in all-terrain mobility and has a suspended interior seat structure for 13 embarked Marines, blast protected positions for an additional crew of three, and improved survivability and force protection over currently fielded systems.

The Marine Corps awarded BAE Systems a \$103.7 million contract for the Engineering, Manufacturing, and Development (EMD) phase of the ACV 1.1 program in November 2015, one of two EMD contracts issued. During this phase, the company is producing 16 prototypes that will be tested by the Marine Corps starting in the first quarter of 2017.

BAE Systems has long been a trusted supplier to the Marine Corps across multiple domains and has more than 70 years of experience designing and building amphibious vehicles. The company is also a leading provider of combat vehicles, having produced more than 100,000 systems for customers worldwide. Iveco Defence Vehicles brings additional proven experience, having designed and built more than 30,000 multi-purpose, protected, and armored military vehicles in service today.

M1A2 tanks and related equipment, support, and training. The estimated cost is \$1.7 billion. The Defense Security Cooperation Agency delivered the required certification notifying Congress of this possible sale on December 12, 2016.



The Government of Kuwait has requested a possible sale in support of its recapitalization of 218 M1A2 tanks, to include two hundred and forty (240) .50 Cal M2A1 machine guns; four hundred and eighty (480) 7.62mm M240 machine guns; two hundred and forty (240) AN/VRC-92E SINGARS radios; and one thousand and eight five (1,085) AN/PVS-7B Night Vision Goggles. Also included is the incorporation of cooling system/thermal management systems; Common Remotely Operated Weapons Station (CROWS) II – Low Profile Stabilized Weapon Stations; special armor; 120mm gun tubes; 2nd generation Forward Looking Infrared (FLIR) sights; embedded diagnostics; gunner's primary sights; Counter Sniper and Anti-Materiel Mount (CSAMM) hardware; upgrade/maintenance of engines and transmissions; depot level support; training devices; spare and repair parts; support equipment; tools and test equipment; technical data and publications; personnel training and training equipment; U.S. Government and contractor engineering, technical, and logistics support services, and other related elements of logistics support. Total estimated program cost is \$1.7 billion.

This proposed sale will contribute to the foreign policy and national security of the United States by helping to improve the security of a friendly country which has been and continues to be an important force for political stability and economic progress in the Middle East.

Kuwait intends to use this equipment to recapitalize its fleet of M1A2 full track tanks in order to modernize and extend the service of the tanks. Kuwait will have no difficulty absorbing this equipment into its armed forces.

The proposed sale of this equipment and support will not alter the basic military balance in the region.

The principal contractors involved in this program are: General Dynamics Land Systems, Sterling Heights, MI; Joint Services Manufacturing Center (JSMC), Lima, OH; Kongsberg Defense Systems, Alexandria, VA, and Johnstown, PA; Raytheon, McKinney, TX; Meggitt Defense Systems, Irvine, CA; Palomar, Carlsbad, CA; Northrop Grumman, West Falls Church, VA; DRS Technologies, Arlington, VA; Lockheed Martin, Bethesda, MD; Honeywell, Morristown, NJ; Miltope, Hope Hull, AL. There are no known offset agreements proposed in connect with this potential sale.

Implementation of this proposed sale is estimated to require five to seven contractors and twenty-five to thirty U.S. Government representatives to Kuwait.

There will be no adverse impact on U.S. defense readiness as a result of this proposed sale.

## Defence Industry

### Recapitalization of 218 M1A2 Tanks and Related Equipment and Support

The State Department has made a determination approving a possible Foreign Military Sale to the Government of Kuwait for recapitalization of 218

This notice of a potential sale is required by law and does not mean the sale has been concluded.

## Contracts

### Rheinmetall wins €135 million Bundeswehr order for survivability upgrades of Fuchs/Fox armoured transport vehicles



The Düsseldorf-based tech enterprise Rheinmetall AG has won a major follow-on order from the German Bundeswehr.

Under the contract, Rheinmetall will modernize ninety of the Bundeswehr's long-serving Fuchs/Fox armoured transport vehicles, significantly enhancing their overall performance level. The order is worth around €135 million (including value added tax). Germany's Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) in Koblenz awarded Rheinmetall the contract following a decision by the budget committee of the German Parliament to make the necessary funds available. Delivery of the vehicles is slated to start in 2017 and end in 2020.

In recent years Rheinmetall has already upgraded 177 Bundeswehr Fuchs/Fox vehicles to the latest 1A8 standard. Compared with previous versions, the 1A8 offers substantially greater resistance to landmines and improvised explosive devices, coupled with improved protection against ballistic threats.

The Fuchs/Fox armoured transport vehicle first entered service in the 1970s. With some 1,200 in service worldwide, it has won a well-earned reputation for dependability and off-road mobility, making it one of the most valued and versatile vehicles in the German inventory. It is currently being used in a number of international operations: MINUSMA in Mali, Resolute Support in Afghanistan and KFOR in Kosovo.

The current upgrade will significantly expand the operational scope of these vehicles, whose many variants continue to make them indispensable for current and future Bundeswehr operations. The crew will benefit from improved survivability and various new technical features.

The current order underscores once again Rheinmetall's role as a premium supplier of army equipment and one of the world's foremost producers of military vehicles, making it a trusted partner of the Bundeswehr and the armed forces of numerous nations

around the globe.

The Bundeswehr has already fielded multiple variants of the 1A8, including mobile command post and armoured personnel carrier versions, a field ambulance, an EOD vehicle as well as an NBC detection variant and the Route Clearing Package (RCP) operator vehicle used for neutralizing mines and improvised explosive devices.

Additional Fuchs/Fox armoured transport vehicles will now be reconfigured for command, APC and EOD roles, with an option for Joint Fire Support Coordination Team vehicles.

This will bring the total number of 1A8 Fuchs/Fox vehicles deployed by the Bundeswehr to 267.

Among the principal modifications characterizing the Fuchs/Fox 1A8 armoured transport vehicle are:

- structural alteration of the hull
- new seats and suspended seating in the fighting compartment to keep soldiers' feet safely off the floor of the hull
- reinforcement of the wheel housings, doors and window mountings
- and additional storage bins and reinforcement of the vehicle exterior

## Defence Industry

### BAE Systems` Team Challenger® 2 awarded Assessment Phase for Life Extension Project

Team Challenger 2, a consortium of companies led by BAE Systems, has signed a contract with the UK Ministry of Defence (MOD) for the Challenger 2 Life Extension Project (LEP) Assessment Phase.

During the Assessment Phase, Team Challenger 2 will work with the MOD to develop options for which systems should be replaced and how the work package would be delivered. Team Challenger 2's work will be led from BAE Systems' facility in Telford, Shropshire, with partners from around the UK and globally.

Jennifer Osbaldestin, BAE Systems Land (UK) Managing Director, said: "We are delighted to win this contract. Our proposal offers the British Army major capability and performance enhancements designed specifically for its soldiers' needs. Ours is an innovative, low-risk solution that future-proofs Challenger 2, giving it the performance to command the battlefield through to 2035.

"Our partners bring the best and most advanced capabilities and technologies available to every element of the Life Extension Project. This includes new sighting systems, gun control equipment, an enhanced electronic architecture and commonality with the British Army's new AJAX vehicle, all while developing the UK's next generation of specialist tank engineers."

BAE Systems Land (UK) has brought together the most experienced defence partners from across the globe to form a UK based team. Team Challenger 2 consists of BAE Systems Land (UK), General Dynamics Land Systems-UK, Leonardo, Safran Electronics & Defense, Moog, QinetiQ and General Dynamics Mission

Systems-Canada. The partners are all world leading experts on tank sub-systems, with General Dynamics Land Systems-UK enabling significant commonality between Challenger 2 Mark 2 and AJAX, the British Army's new armoured vehicle family. The team will work closely with Babcock-DSG during the Assessment Phase.

Vice President of General Dynamics Land Systems-UK, Kevin Connell, added: "This is great news for our facility in Merthyr Tydfil, where we carry out the assembly, integration and testing of AJAX. Challenger 2 would be brought up to the Mark 2 specification at that same facility, optimising investment already made and enabling Team Challenger 2 to hit the ground running."

Team Challenger 2 has been working for several months on the Assessment Phase prior to contract award and has invested significantly in the Assessment Phase to ensure the very best solution for the British Army.

BAE Systems designed and built Challenger 2 and has supported the tank since its entry into service, including many Urgent Operational Upgrades for operations in Bosnia, Kosovo and Iraq. General Dynamics Land Systems-UK is currently developing the AJAX family of vehicles which will be delivered to the British Army through 2017-2024.

yet another example of the advanced technology BAE Systems and its partners can deliver to our customers."

The integration of this advanced APS solution onto the Dutch CV90s demonstrates the vehicle's adaptability to new and evolving technologies to meet customer-specific requirements.

"During this test phase we will pre-qualify the active system against our threat specification, and together with our partners analyze system safety and prepare for its integration onto our CV9035NL vehicles," said Hans de Goeij, project manager at the Netherlands Defence Materiel Organisation, Ministry of Defence. "We expect to make a decision on the next phase by early 2018. With Iron Fist, the Netherlands is expected to become the first NATO country with an Active Protection System of its kind on combat vehicles."

BAE Systems is a leader in the development of survivability technologies for combat vehicles. The company has, for example, developed a system called ADAPTIV, which uses cloaking technology to alter the appearance of a vehicle, making it harder to identify. BAE Systems has also developed a situational awareness tool called BattleView 360. BattleView 360 employs sensors outside the vehicle that feed a 360-degree image to a helmet-mounted monocular, allowing soldiers inside the vehicle to essentially "see through" armor and better detect threats.

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### Defence Industry

#### Dutch CV90s to become first NATO combat vehicles to receive active protection



BAE Systems has received a contract from the Netherlands for the testing and verification of Active Protection Systems (APS) on its CV90 Infantry Fighting Vehicles.

Active Protection is an advanced solution consisting of countermeasures that can intercept incoming rocket-propelled grenades, anti-tank missiles, and other threats to increase crew and vehicle survivability.

BAE Systems, the manufacturer of the Dutch CV9035 variant vehicles, will lead the APS integration. BAE Systems will also carry out the future installation of the system, called Iron Fist, developed by Israeli supplier IMI Systems. Iron Fist is an automated system that uses a radar to detect and track threats and then takes action to eliminate the threat.

"Iron Fist will give the Dutch Army a highly sophisticated defensive tool on its CV90s to counter threats and improve the safety of the vehicle and its crew," said Tommy Gustafsson-Rask, managing director of Sweden-based BAE Systems Högglunds. "Iron Fist is

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### Defence Industry

#### BAE Systems to deliver vehicle mounted mortar systems to Swedish Army



BAE Systems has received a 575 million SEK (\$68 million) contract for the installation of vehicle mounted mortar systems on Swedish Army CV90 Infantry Fighting Vehicles.

The installation of the company's mortar system, known as Mjölner, on 40 CV90s will considerably increase the indirect fire capability of the vehicles to support mechanized battalions.

"The delivery of the Mjölner solution to the Swedish Army allows it to field a capability well adapted for the CV90 while enhancing the fleet's firepower," said Tommy Gustafsson-Rask, managing director of BAE Systems Högglunds.

Mjölner is the hammer of Thor in Norse mythology. The contract was issued by the Swedish Defence Materiel Administration (FMV), with first deliveries scheduled to take place in the first quarter of 2019.

CV90 is a family of Swedish tracked combat vehicles designed for FMV by BAE Systems Högglunds and

BAE Systems Bofors, which provides the vehicle's turrets. More than 4.5 million engineering hours has contributed to the development of this advanced vehicle. The Swedish version is outfitted with a turret equipped with a 40 mm autocannon.

The Swedish Army has more than 500 CV90s. Earlier this year, BAE Systems was awarded a contract to refurbish 262 of the vehicles, including survivability, turret, and combat system performance upgrades. Adding the mounted mortar systems addresses another priority that helps increase the vehicles' lifespan in support of Army capabilities.

Denmark, Estonia, Finland, the Netherlands, Norway, and Switzerland also operate CV90s.

## Defence Industry

### Rheinmetall awarded Challenger 2 Life Extension Programme Assessment Phase Contract

Rheinmetall has been awarded a Challenger 2 Life Extension Programme (CR2 LEP) Assessment Phase contract by the United Kingdom Ministry of Defence.

The British Army is seeking to extend the service life of the Challenger 2 main battle tank through to 2035. During the Assessment Phase, Rheinmetall will develop solutions in line with user requirements set by the MOD.. The programme includes addressing existing obsolescence issues, with Rheinmetall offering options that will sustain the capability and effectiveness of the Challenger 2. The Assessment Phase contract is worth J23 million.

At the end of the Assessment Phase Rheinmetall will make an offer for the Demonstration, Manufacture and In Service contract phases. If successful, under current planning, this contract would see Rheinmetall becoming the Design Authority for the Challenger 2 and cover the modification of Challenger 2 tanks to Mk 2 standard.

Rheinmetall is currently involved in upgrading the technical and tactical performance of the Leopard 2 main battle tank for two major international customers and offers a wide array of cutting-edge systems. Continuous investment in research and development keep Rheinmetall at the forefront of modern tank technology, which the company plans to share with the British Army.

With its experience and technological wherewithal to take the lead in every aspect of the CR2 LEP, Rheinmetall is ideally placed to cover all the current lines of development, including assured long-term logistical support, which will maintain Britain's longstanding expertise in tank development and design.

A key aspect of the Rheinmetall offer is to involve UK suppliers in the Assessment Phase, with a Rheinmetall systems engineering team based in the UK to support CR2 LEP and other programmes.

## Contracts

### The Netherlands procure Leguan bridge layers



Munich/Koblenz -- On behalf of the Dutch procurement office (DMO), the German Federal Office of Bundeswehr Equipment (BAAINBw) signed an agreement with Krauss-Maffei Wegmann (KMW) for the procurement of five Leguan bridge layer systems on Leopard 2 chassis on 20 December, 2016.

The entire procurement plan also includes training simulators, accessory equipment and an option for additional bridge layer systems. The vehicles will be transferred to the Dutch army in 2019 and 2020.

This version of the Leguan is capable of laying and transporting two 14 metre long bridges or one 26 metre long bridge, even under combat conditions.

The Dutch army is the sixth user of the Leguan on Leopard 2 chassis. In total, armies from 17 countries operate the Leguan bridge layer system on various mobility platforms.

## Contracts

### KONGSBERG signs orders to the CROWS program valued MNOK 125



The orders with the U.S. Army are for delivery of Low Profile CROWS («Common Remotely Operated Weapon Station») configuration for the M1A2 Abrams Main Battle Tank. The orders are related to the CROWS contract signed in August 2012.

The PROTECTOR Low Profile is a variant of the CROWS family, but modified in order to enhance the visibility for the tank commander on the M1A2 Abrams Main Battle Tank platform. This innovation is a result of close cooperation between the customer and KONGSBERG.

“This contract confirms KONGSBERG's strong relationship with the U.S. Army, and their trust in us as a reliable and innovative supplier. We are proud to be able to answer to the users' needs and requirements, and

appreciate that the U.S Government continues to focus on enhanced protection for the soldiers in the field by developing the PROTECTOR CROWS Low Profile further”, says Espen Henriksen, President of Kongsberg Protech Systems.

The PROTECTOR Remote Weapon Station is designed for small and medium caliber weapons and can be installed on any type of platform; it is a fully stabilized, combat proven system qualified for global operations. The PROTECTOR protects military troops by allowing the vehicle's weapons to be operated from a protected position inside the vehicle.

As of 2016, the PROTECTOR system has been chosen by 18 nations and KONGSBERG is the world’s leading provider of Remote Weapon Stations.

