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Future Technologies

UK company pioneers autonomous hybrid vehicle for extreme off road operations



At DSEi 2019 the world leading Special Forces vehicle developer, Supacat, is unveiling its Technology Demonstrator for hybrid and optionally manned operations, developed to keep pace with battlefield logistical requirements on extreme terrain and unpredictable routes.

The Technology Demonstrator has been developed by UK headquartered Supacat in collaboration with the University of Exeter as part of an Innovate UK-supported Knowledge Transfer Partnership (KTP).

“Electric Hybrid propulsion and autonomous technologies are two important innovations that will enhance the capabilities of users of our in service high mobility platforms. We have focussed our efforts on designing open system architectures, allowing extensive use of commercial off the shelf (COTS) components, which we see as key to a successful and sustainable military solution in a rapidly evolving technology sector”, explains Steve Austen, Engineering Director of Supacat parent, SC Group.

“It is in Supacat’s DNA to tailor its platforms and solutions to each customer’s requirements. Our approach uses a common electric drivetrain, each of which can be customised through different powering options depending on mission, range, payload and operating environment. For example, a customer may have a mission profile with a mixture of on road and off road operations, with a need for silent operation for a percentage of time – the proportion of these components will determine whether series or parallel hybrid options are employed or if full electric propulsion is needed. As battery or fuel cell technology advances and diesel engine development responds to legislation, these options will inevitably change and we must provide vehicle architectures that can accommodate such evolution”, Austen comments.

“We are exploring, developing and incorporating autonomous technologies in a way that will permit the level of collaboration and control from human to vehicle or from vehicle to vehicle to be altered depending on the complexity of the work being undertaken. Allowing vehicles to be ‘optionally manned’ will remove users from the ‘dull, dirty or dangerous’ tasks wherever possible and create a real operational advantage for the end user”, says Austen.

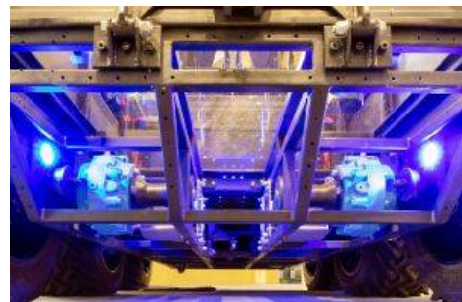
The ‘optionally manned’ demonstrator utilises:

- a terrain detection and response system for enhanced mobility and optimised endurance,
- an object categorisation and response system for obstacle clearance or avoidance during technical off road driving, which can be tailored to the capabilities of the vehicle, driver or a remote operator, and
- a path planning and motion behaviour system using simultaneous localisation and mapping (SLAM) for the navigation of lead and follow on vehicles.

“Few autonomous vehicle projects focus on highly technical off road terrain. The challenge here is to manage and reduce the volume of data needed about the unpredictable non-linear environment around the vehicle to assure effective, safe and predictable performance without having to import and export masses of data from it”, notes Austen.

The Technology Demonstrator uses the Supacat workhorse, the All Terrain Mobility Platform (ATMP), as its base vehicle as ATMP is a mature, battle proven and relatively simple product, enabling the development programme to focus on the new technologies and capabilities and subsequently allowing rapid development. It retains the renowned mobility and class leading payload of the original vehicle (up to 1600g).

Supacat is welcoming potential users and customers to demonstrations at its Devon facility over the next six months and is actively seeking new mission challenges that enable them to benchmark the performance of the vehicle and level of autonomy achieved during continued development in conducting realistic tasks. Use of Machine Learning, supported by Neural Networks will continue to allow the system to develop and be adapted to different off road vehicles and applications.



Exhibitions

Supacat, Rheinmetall and SCISYS partnership showcases new High Mobility Integrated Fires Capability

Supacat, Rheinmetall Defence and SCISYS have partnered to showcase a new capability for light forces, the ‘High Mobility Integrated Fires Capability’, at DSEi. The partnership demonstrates Supacat’s 646 HMT platform mounted with Rheinmetall’s MWS81 mortar system in its first integration on a light vehicle. The target acquisition and integrated fire support platform is networked with SCISYS GVA compliant platform and mission software.

Supacat's highly mobile HMT platforms with their superior off road performance allow users to perform high tempo operations delivering indirect fire for light role forces while the MWS81 mortar capability allows for rapid 'into action time'. The Vingmate sight provides target acquisition and location during day and night operations, with targets being shared over the battlespace data network enabling Support Weapon effects to be directed precisely onto targets.



The SCISYS developed GVA compliant platform and mission software shares data and video around the platform to each crew member's display and into the battlespace networks, enhancing shared situational awareness and speed of decision making. The displays are supplied by Leonardo.

"This enhanced capability is a first for light forces and offers a solution to a number of potential requirements among the green army and Special Forces", said Phil Applegarth, Head of Supacat.



Exhibitions

MBDA SHOWCASES TANK DESTROYER VEHICLE WITH PGZ AT MSPO 2019



MBDA and PGZ have unveiled at MSPO 2019 a Tank Destroyer armed with the Brimstone precision strike missile.

PGZ Companies and MBDA also signed a statement of co-operation at MSPO to confirm readiness to co-operate on offering this solution to Poland and export markets, recognising the combination of MBDA's Brimstone missile with PGZ's armoured vehicle expertise offers the best solution for Poland's Tank Destroyer requirement from a military capability, sovereignty and industrial perspective.

Sebastian Chwałek, Deputy CEO of PGZ, said: "We are growing our co-operation with MBDA into new areas. We have agreed on the ways of offering those solutions in export markets. By combining our competences with the experience of our British partners,

we are able to achieve a lot and deliver the most modern solutions to both Polish and allied armed forces."

Adrian Monks, MBDA Sales Director in Poland, said: "Pairing the combat-proven MBDA Brimstone missile with the diverse range of current and future Polish platforms provides the ability to deliver rapid military capability for Poland and for wider markets, whilst strengthening our co-operation with PGZ Group on missiles."

The most important part of the Joint Statement of Co-operation is MBDAs' declaration that Brimstone missile technology and know-how will be transferred to PGZ, with MESKO SA responsible for missile production. This co-operation is another field of the business relationship developed on the strategic co-operation between PGZ companies and MBDA.

The flexibility of the integration solution and ease of integration with the existing Polish targeting systems makes it flexible to be installed onto or within multiple Polish platforms, including those from WZM SA, HSW SA and Obrum, in any configuration and number of missiles.

The development comes in response to Poland's requirement for a Tank Destroyer able to counter massed armour formations. With its long-range, all-weather performance, ability to defeat active protection systems (APS), salvo-firing and moving target capability, Brimstone is uniquely able to meet this challenge.

The system is capable of engaging line-of-sight and non-line-of-sight targets, with a choice of engagement modes using digital targeting data provided over standard secure military networks fully interoperable with NATO.



Exhibitions

Otokar offers solutions with technology transfer and local manufacturing models



Otokar, a Koz Group company, will participate in the 20th edition of DSEI on 10-13 September 2019 in London, UK. Otokar, which offers solutions with transfer of technology and local manufacturing models for land system requirements of its customers, exhibits TULPAR armoured tracked vehicle and COBRA II wheeled armoured vehicle at DSEI 2019.

Otokar, serving more than 30 countries with combat-proven products, is participating at DSEI, the world leading defence industry and security event. At its stand, Otokar is exhibiting the TULPAR armoured tracked vehicle with Mızrak-30 turret system and also, wheeled armoured vehicle COBRA II is being displayed with Keskin turret system in the Land Zone

Static Display Area. In addition to promoting its broad product range at the exhibition, Otokar will also provide information about its flexible business model which includes transfer of technology and local manufacturing models.

"WE ARE READY TO MEET REQUIREMENTS WITH TECHNOLOGY TRANSFER AND LOCAL MANUFACTURING MODELS"

General Manager Serdar Gürgeb emphasized that Otokar has the capabilities and the infrastructure to rapidly design and develop modular products in line with users' current and future needs, "In the last 10 years, we have allocated 8.5 per cent of our revenues for our R&D activities. We continue to introduce innovative solutions in land systems by taking into account the current and future requirements of modern armies and security forces. Last May, we unveiled one of the best examples of this with our electric armoured vehicle Akrep IIe, which provides an excellent choice for reconnaissance and surveillance missions.

Our combat-proven vehicles are actively used in very different geographies, extreme climatic conditions and conflict zones. We analyse the different needs and expectations of our users for land systems, and develop solutions that meet these requirements in the fastest manner thanks to our excellent engineering and superior R&D capabilities. We are ready to meet the different requirements of armed forces, not only by supplying products but also through transfer of technology and local production models. At the exhibition, we plan to share our experience and capabilities in this field with our customers."

Gürgeb stated that Otokar, as a supplier of NATO and the United Nations, brings its know-how and experience in modular land systems to tracked vehicles with TULPAR, "TULPAR is designed to meet today's and future needs of modern armed forces. With its superior mobility and high level of protection, the vehicle can operate in a wide range of challenging terrains and climate conditions. TULPAR, which features a modular design, can be manufactured in a number of variants to meet user needs."

TULPAR

TULPAR is designed as a multi-purpose vehicle with variants ranging from 28 tonnes to 45 tonnes to fully satisfy the future global requirements. Future-oriented perspective of modularity is to increase operational flexibility by using common components and a common chassis over wide range of vehicle variants. TULPAR comes in several variants that share common subsystems. The common platform can accommodate a medium tank; infantry fighting vehicle; armoured personnel carrier; reconnaissance vehicle; command and control vehicle; air defence; ambulance; repair and recovery vehicle; mortar vehicle and other vehicle variants. TULPAR is a multipurpose platform with high lethality, modularity and growth potential that can be tailored to meet current and future operational requirements.

COBRA II

COBRA II, manufactured by Otokar with the mission

of designing and manufacturing globally competitive land systems products, stands out with its superior performance. COBRA II offers high level of protection and payload capacity and large internal volume. In addition to superior mobility, COBRA II also comes with the capacity to accommodate 10 personnel including the driver and commander, offering high protection against ballistic, mine and IED threats. Delivering high performance in the toughest terrain and climate conditions, COBRA II is optionally available with amphibious capability, adapting perfectly to different missions as needed. COBRA II, subjected to rigorous field tests in different parts of the world, travelled thousands of miles. More importantly, different variants of COBRA II are today operated in various combat operations throughout the Middle East and Africa proving the the vehicle's adeptness to enhance combat capability of the user. Preferred especially for offering a wide range of weapons integration and mission equipment options, COBRA II is successfully used in border protection as well as internal security and peacekeeping missions. The modular structure of COBRA II also makes it possible to be used as a personnel carrier, weapons platform, ground surveillance radar, CBRN reconnaissance vehicle, command control vehicle and ambulance. COBRA II is already in service with Turkish Armed and Security forces and with various export customers.



Robots

General Dynamics UK selected for Army Warfighting Experiment 2019



General Dynamics UK has today announced that it has been selected to participate in the British Army Warfighting Experiment 2019 (AWE'19) following the acceptance of its proposal for Manned Unmanned-Teaming (MUM-T), which was submitted to the UK Defence and Security Accelerator (DASA) earlier this year.

General Dynamics will deliver and demonstrate its Multi-Utility Tactical Transport (MUTT) 646 Unmanned Ground Vehicle (UGV) and an optionally-tethered Unmanned Air System (UAS), deployed from the company's AJAX reconnaissance vehicle during the AWE'19 experiment in March 2020. The remote assets will be controlled, and have imagery displayed directly to the current AJAX Commander's crew station, with a dismounted option.

David Hind, Strategy Director (Land) at General Dynamics UK, said:

“Through AWE’19 we will demonstrate that AJAX is the first of a generation of digital Armoured Fighting Vehicles that have the flexibility and the openness in their architecture to rapidly integrate third-party technology and, in doing so, readily contribute to the British Army’s plans for ‘prototype warfare’.”

During the experiment, which will be run by the Defence Science and Technology Laboratory for Army HQ, the British Army will assess the Commander’s cognitive burden over a range of representative vignettes. Several innovative technologies will be used during the demonstration.



Exhibitions

General Dynamics Land Systems–UK showcases adaptable Foxhound vehicle at DSEI 2019



General Dynamics Land Systems–UK is showcasing its highly-adaptable Foxhound 4x4 vehicle at Defence and Security Equipment International (DSEI) 2019.

Since 2012, 400 Foxhound vehicles have been in-service with the British Army and have been deployed worldwide, including in Afghanistan and Iraq, offering exceptional mobility, ride and blast protection. Designed and built in the UK, Foxhound integrates highly survivable V-shaped hull technology and utilises a dismountable crew pod design for different roles, including the existing Foxhound Troop Carrier, a Weapons Mount Installation Kit (WMIK)-style Reconnaissance variant, a flat-bed Utility load carrier, and a Command and Control (C2) variant. The latest variant of the British Army Foxhound fleet enables the vehicle to undertake a Public Order role.

Carew Wilks, vice president and general manager of General Dynamics Land Systems–UK, said:

“Foxhound is the protected mobility vehicle of choice for British Army light infantry and specialist troops on operations worldwide. Throughout its service, Foxhound has delivered high-levels of operationally-proven protection, reliability and adaptability, and most importantly extremely high-levels of availability. The British Army knows it can trust Foxhound and the latest Public Order variant shows its adaptability to meet a wide variety of requirements for today’s modern Army.”

General Dynamics Land Systems has a long pedigree and worldwide experience in delivering tracked and wheeled military vehicles, alongside specialist knowledge in complex, scalable Electronic Architectures. It delivers, amongst others, the AJAX family of vehicles, the Abrams main battle tank, LAV (Light Armoured Vehicle) and Stryker Family of Vehicles, and the Cougar Mine Resistant Ambush–Protected (MRAP).



Contracts

IVECO DEFENCE VEHICLES AWARDED CONTRACT TO DELIVER A NEW GENERATION OF MEDIUM MULTIROLE PROTECTED



Iveco Defence Vehicles, a company of CNH Industrial N.V., announced today that it has been awarded a contract by the Dutch Ministry of Defence to provide 1275 medium multirole protected vehicles denominated “12kN”.

The acquisition is part of the Defence-wide Replacement Programme of Wheeled Vehicles (DVOW - Defensiebrede Vervanging Operationele Wielvoertuigen), with deliveries from 2022 through 2026. The Iveco Defence Vehicles’ MTV – Medium Tactical Vehicle, is designed to combine high tactical 4x4 mobility, optimal off-road performance and high crew protection, together with an excellent payload capability. Outstanding modularity and system integration capabilities are guaranteed across all range variants such as hard top, soft top, pick up, casualty transport and personnel transport, in order to support all different Military users, from Army to Marines, Navy, Air Force, Special Operational Units and Military Police. High reliability, ease of maintenance and low through life cycle costs were core requirements during the design of MTV, guiding the choice of the main assemblies towards components with proven performance and reliability over many millions kilometers in the most diversified and demanding environmental conditions. Over the years, Iveco Defence Vehicles has delivered many vehicles to the Dutch Army from its wide commercial and military product range such as the Iveco Stralis 6x2 long haulage lorries, the Trakker 8x8 for the Army’s Fire Department and the EuroCargo 4x4 delivered to the Dutch Marines for the Caribbean territories. This award represents an important milestone in the consolidation of the strategic partnership between the Dutch MoD and Iveco Defence Vehicles, confirming

once again the leadership of the company in the multirole vehicle segment for defense and homeland security missions.

