



2022

# EUROSATORY

## Daily

DAY  
1**EDR** MAGAZINE  
European Defence Review - By E.D. Publishing

Monday, June 13



## BAE SYSTEMS HÄGGLUNDS: THE CV90 GOES DIGITAL

By VALERIO DEL GRANDE

**K**nown as CV90, for Combat Vehicle 90, the tracked infantry fighting vehicle designed and produced by BAE Systems Hägglunds at its Örnsköldsvik facility, 400 km north of Stockholm, is the most produced vehicle of its category in Western Europe. Although the number indicates its date of creation, it was introduced in the Swedish Army in the mid-1990s, along the years the company developed the vehicle in all its aspects, mobility, firepower, survivability, C4/ISTAR and human-machine interface (HMI). Many improvements came from lessons learned shared with CV90 Users' Club, based on deployments in Liberia, Afghanistan, and Lithuania under the flags of four different nations.

At Eurosatory 2022, the company exhibits the fifth iteration of the CV90, which is in fact a completely different vehicle from the original one. It features the newly developed turret, known as d-Turret, with the first letter standing for "digital", which is heavily based on the turret developed following Dutch Army requirements. In fact, the entire vehicle avionics are compliant with the NATO Generic Vehicle Architecture (NGVA), giving maximum flexibility in terms of future upgrades.

Known as CV90 MkIV, the vehicle on show has a combat mass 50% higher than the Mk0, up to 38 tonnes, while the new Scania V8 engine coupled to a Caterpillar Defense X300 HD

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# VITEC LAUNCHES NEW VIDEO ENCODER

By GILES EBBUTT

**Video streaming specialist VITEC is showcasing its range of full motion video technologies at Eurosatory, including the new military-grade MGW Pico+ TOUGH, a robust and compact credit card sized encoder; the MGW Diamond TOUGH, a ruggedly built encoder suited to delivering any type of ISR or situational awareness (SA) video content. Also being shown is the FITIS™, a video content management solution for rapid deployment in the field.**

HALL  
5A  
STAND  
K701

Weighing under 400g, with 8.8W power consumption for 4K or dual channel streaming, the MGW Pico+ TOUGH is a miniature MILSTD certified HEVC and H.264 rugged video encoder. It encodes and streams real-time video with frame accurate KLV metadata. It is fanless and its pocket-size enclosure is designed for use on unmanned and manned vehicles, in fly-away kits or hand-carried in extreme conditions. MGW Pico+ TOUGH is available as a portable rugged encoder or as a single board with UHD encoding support for integrators. VITEC's MGW Diamond TOUGH is a fanless, power-efficient quad channel HEVC and H.264 HD/SD encoder in a rugged enclosure suited to delivering any type of ISR or SA video generated by ground



vehicles, airborne platforms and marine vessels in extreme environments. The encoder provides contrast and brightness in any conditions due to its high dynamic range (HDR) support and delivers advanced HEVC compression allowing users to stream HD/SD video (at up to 1080p60) with up to 50% bandwidth savings compared to current H.264 standards.

For dissemination and content management of FMV streams and files, VITEC is also displaying FITIS™, an all-in-one solution that can be rapidly

deployed in the field or in a secure, hosted site to serve as the central interface for managing live and recorded IPTV content, user access rights, and video distribution workflows. FITIS enables decision makers and analysts to view, archive, retrieve, and manipulate ISR footage and tactical military video streams quickly, allowing live and recorded video for to be exploited for actionable, real-time intelligence. FITIS also offers editing and collaboration capabilities for analysing and sharing video assets with KLV/STANAG metadata. ■

# ADVANS SERIES PROVIDING POINTING TO DANISH CAESAR® 8X8

By ELISABETH GOSELIN-MALO

Nexter has trusted iXblue's Advans Series Inertial Navigation Systems (INS) to provide accurate pointing capabilities to the CAESAR® 8x8 self-propelled howitzers sold to the Danish Ministry of Defence Acquisition and Logistics Organisation (DALO). The awarded contract includes the delivery of 15 CAESAR® 8x8 previously acquired in 2017, and an additional 4 systems bought in 2019. iXblue's INS allows for continuous, instant-on position and orientation at all times, including in GNSS-denied environments. This arguably represents the largest success for the Saint-Germain-en-Laye based company, as it represents the first CAESAR® 8x8 produced by Nexter and sold on the export

market. As such, the development of this program is fundamental to the future and progress of CAESAR® 8x8.

Nexter and iXblue are long-standing partners, where they previously worked together to provide inertial pointing to the 105LG1 105mm tracked howitzer, as well as the CAESAR 6x6 self-propelled howitzer. Today, with Advans Series equipping the CAESAR® 8x8, iXblue's INS equips all of Nexter's artillery range which is significant.

In this most recent contract, the two companies kept working together to ensure the best-level of service and performance for the DALO. Their true partnership was



highlighted during the testing of the Advans Series, where during the trials, the system's results met with success the requirements laid out by NATO and the Danes. On this, Bruno Protte, Commercial Manager at iXblue, says, "although being experts in our field, we remain humble

and keep learning how to best serve our clients. This flexibility and ability to react is in our DNA since our beginnings." ■

HALL  
H6  
STAND  
J137



*continues p 1*

X300 HD transmission provides up to 1,000 hp, with an increase of nearly 100%. Steel tracks have been replaced with rubber tracks provided by Soucy from Canada, while active dynamics have been added that improve performances and reduce life support cost. A few weeks ago, the CV90 MkIV was declared the preferred bidder for the local IFV programme by the Slovak Ministry of Defence.

The adoption of active suspensions that reduce the level of vertical and pitch accelerations in light terrain and increase energy absorption in tough terrain, allowing a 40% higher maximum cross country speed. The higher mobility ensured by this option, which is also available for upgrading previous versions, contributes to survivability. All the GVW increase from the Mark III to the Mark IV, equal to 3 tonnes, goes to the payload, allowing BAE Systems Hägglunds to answer evolving customers' requirements. An increase in protection levels is usually part of those, the approach being to exploit a three-layer solution including active protection, with the integration of the Iron Fist, designed by Israel Military Industries now of El-

bit Systems currently ongoing qualification, followed by reactive and by passive composite armour. Other hard- and soft-kill active protection systems were integrated and tested in previous years.

The 4<sup>th</sup> generation electronic architecture is what allows to link together all electronic subsystems, fully exploiting their capabilities to improve operational effectiveness while reducing operators workload. This has a considerable impact both on the chassis and the turret, data and images provided by sensors being distributed to the crew according to their role on board, also allowing inter-vehicle exchange of data and images.

What is totally new on the CV90 Mark IV is the d-Turret. The turret body has been completely redesigned, with huge ergonomic improvements. The main gun was moved forward, which increases available space, allowing direct view between commander and gunner, ensuring better coordination, and moreover augments the gun maximum elevation from 32° to 45°, a key factor in urban as well as in counter-UAS scenarios. In addition, it reduces the height at

the roof by 80 mm. Firepower has been increased, the Northrop Grumman Bushmaster III 35 mm cannon having 20% extra ready to fire ammunition, while the coaxial machine gun pod on the right of the turret contains around the double of 7.62 mm ammunition available in the Mark III. Firing trials also proved that the new turret was capable to ensure a higher kill probability compared to the older one, which further increases the number of potential targets to be hit with a single load of 35 mm ammo. Due to Dutch Army requirements, an antitank missile launcher has been added on the right side of the turret, which contains two Rafael Spike LR2 missiles with an effective range of 5.5 km. BAE Systems Hägglunds has already studied at system integration level the addition of different types of missiles, such as MBDA's MMP, Raytheon/Lockheed Martin FGM-148 Javelin and Lockheed Martin AGM-114 Hellfire.

To shoot far you need to see far. The d-Turret is fitted with a mast-mounted electro-optic perisopic sight (EOPS) which sensors ensure detection, recognition and identification ranges compatible with those needed by the effectors ins-

talled in the turret. The optoelectric head can be used on the move even with the raised mast, which allows for a 360° unimpeded view at -10° elevation, the raised position avoiding interferences with other subsystems mounted on the turret. According to the company, the EOPS is already fitted with Artificial Intelligence algorithms, Machine Learning algorithms being part of them, which reduce operators' workload in terms of target identification and tracking, this being one of the areas where major improvements can be expected in the near future. Together with the new thermal imager for the gunner, the EOPS ensures full situational awareness, the 4<sup>th</sup> generation high speed electronic architecture capable to support one trillion floating point operations per second guarantees full exploitation of all sensors and communication systems installed on board today and in the coming years.

The CV90 MkIV HMI was designed by BAE Systems Hägglunds in close cooperation with the client, the company being ready to satisfy customers' specific needs. ■

# BECAUSE A TINY GRAIN OF SAND CAN STOP A KEY MISSION.



## ARQUUS' COMMITMENT. TECHNICAL SUPPORT AND OPERATIONAL MAINTENANCE

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# Les gagnants du 1<sup>er</sup> Trophée Challenge Start-up

## réalisé par Eurosatory en partenariat avec Agorize

Par JEAN-MICHEL GUHL

**1<sup>er</sup> prix • Mesodyne, États-Unis** ([www.mesodyne.com](http://www.mesodyne.com)), est une start-up états-unienne qui commercialise des générateurs de puissance efficaces, fiables et silencieux, utilisant n'importe quel type de carburant et qui apportent une autonomie dix fois plus longue à des véhicules sans pilote, portables et autres équipements. Voir la vidéo de présentation sur <https://youtu.be/BLFZo4tbLMA>.

**2<sup>e</sup> prix • M-Cador, France** ([www.m-cador.com](http://www.m-cador.com)), a développé un moyen d'assistance aux sociétés pour automatiser et optimiser leurs tâches d'inspection sous la forme de caméras intelligentes capables d'inspecter toutes surfaces, moteurs ou pièces. Safran, MBDA et Thales sont au nombre des utilisateurs les plus connus. Voir la vidéo de présentation sur [www.bsmart.fr/video/6286-smart-futur-partie-22-mai-2021](http://www.bsmart.fr/video/6286-smart-futur-partie-22-mai-2021).

**3<sup>e</sup> prix • infiniDome, Israël** ([www.infidome.com](http://www.infidome.com)), est une firme qui a développé des solutions confidentielles résilientes de navigation et de protection adaptées aux systèmes GPS des UAV et de tous véhicules. Il s'agit de les renforcer efficacement contre les tentatives de brouillage et de permettre en retour d'assurer la disruption efficace des liaisons GPS adverses.

## QUE RÉALISE MESODYNE ?

**(Focus sur le gagnant du Trophée de l'Innovation à Eurosatory)**



### Il s'agit de la LightCell :

Elle n'est pas seulement utile aux petits systèmes sans pilote, mais aussi à toute application limitée par le poids des batteries ou la disponibilité de l'énergie électrique conventionnelle (réseau, solaire, éolienne). Elle multiplie par dix l'endurance des drones à aile fixe par rapport aux batteries seules. L'augmentation de l'endurance est particulièrement utile lorsque le drone doit se rendre sur un site éloigné et inaccessible, effectuer sa mission et revenir. De faibles vibrations dues au processus de conversion statique de Mesodyne sont nécessaires pour obtenir des images précises.

Elle augmente l'endurance des navires de surface sans équipage et des capteurs à distance qu'ils transportent de quatre à huit fois plus loin par rapport aux batteries traditionnelles (en fonction de la charge utile et du navire), ce qui permet une collecte de données plus fiable et moins coûteuse pour garantir la sécurité des océans et des côtes. Elle s'adresse aux instruments industriels et aux stations scientifiques éloignés qui ne peuvent être alimentés par l'énergie solaire, par exemple à des latitudes élevées ou sous un couvert forestier, ou lorsque l'espace n'est pas disponible. Mesodyne offre une fiabilité et un temps de fonctionnement accrus et facilite le transport vers le site distant en réduisant le poids.

Enfin, la LightCell libère les combattants qui effectuent en général des missions prolongées en transportant des batteries de 3 à 5 kg. Mesodyne peut offrir une réduction de poids de 75 %, leur permettant ainsi de transporter plus de munitions et d'eau, tout en s'intégrant à la logistique d'approvisionnement en carburant existante. ■



## LACROIX INTRODUCES S-KAPS SOFT-KILL SOLUTION

By MARC CHASSILLAN

**S**oft-kill systems are the first layer of the global protection of a fighting vehicle. They are designed to detect threats and divert them from their primary purpose of destruction. LACROIX has re-engineered its proven GALIX-AOS into an open and scalable solution, the S-Kaps (Soft-Kill Advanced Protection System). Connected to the vehicles vetronics, S-KAPS is built around a computer ca-

pable of merging data from different sensor groups to implement decision, reaction and protection optimization algorithms. Several modes of operation are available, with or without a human in the loop and with several degrees of automation. S-KAPS offers several tried and tested detection solutions, using different technological principles such as acoustics, emission detection in the entire elec-

tromagnetic spectrum, from UV to far infrared, including all laser types and radars. S-KAPS deploys GALIX multi-band masking ammunitions (visible, infrared and millimeter), disengagement solutions and modern decoy concepts. S-KAPS was developed within the PRONOIA project (PROtection Novatrice Orientable Intégré d'Autoprotection - or Innovative integrated directional self-protection - soft-

kill), under the authority of the French Ministry of Defence. PRONOIA is a key element of the collaborative protection concept. GALIX ammunitions are installed on more than 15,000 platforms around the world. Lacroix is also introducing for the very first time its new wide-band masking solution in 76 mm caliber, to provide an effective, low-toxicity, no fire risk protection grenade. ■

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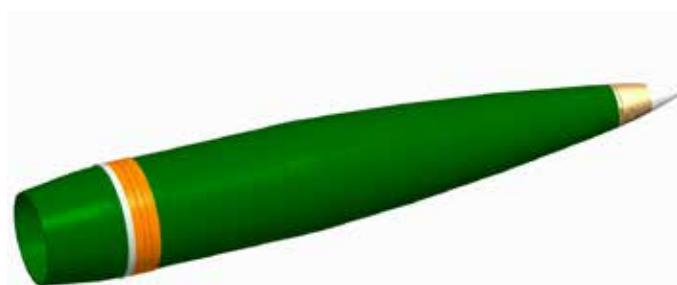
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# INCREASING EFFECTIVENESS AND RANGE: THE NEW LU 220 HE 155 MM MUNITION BY NEXTER ARROWTECH

By PAOLO VALPOLINI

The advent of 52 calibre 155 mm artillery guns led to the development of a new generation of munitions that were able to fully exploit the increased range capability of those systems. In Europe then, GIAT Industries munitions business unit developed the LU 211, which in 1999 was classified as "MUnitions à Risque Atténué" (MURAT, attenuated risk munitions) by the Armament Inspector for Powders and Explosives (IPE), the French National Explosive Safety Authority. That new artillery round was developed to maximise the range of the new Caesar 155/52 truck-mounted howitzer, at that time, under development by the same company and that would enter service with the French Army in 2008. To do so, the shape of the round was different from that of older 155 mm munitions destined to 39 calibre howitzers, the more streamlined body giving a lower aerodynamic drag, hence a longer range, further enhanced by the longer barrel that allowed exploiting to the limit the pressure generated by the maximum charge. Then, GIAT Industries also developed the insensitive explosive used in the LU 211 HE munition, named XF 13 333, the key element in the "muration" of that ammunition.

Compared to a typical COMP B explosive, a highly insensitive explosive has a lower efficiency in terms of energy, losing between 10 and 20% depending on various factors, among which the angle of the round when it hits the target. Further increasing the range and bringing back the terminal effect to that of the



Comp B loaded LU 211 munitions were therefore the aim of what is now known as Nexter Arrowtech France.

The new ammunition development study is carried on within the framework of a research programme sponsored by the French DGA, the French Defence procurement and technology agency. The study phase is coming to an end and the LU 220 - this the name of the new round - is currently rated at TRL 6. "We need to qualify it, and to submit it to all tests required by STANAGs," a company source told EDR On-Line, one of those being STANAG 4439 "Policy for Introduction and Assessment of Insensitive Munitions".

How to obtain two contradictory results, increasing range together with terminal effect? The company R&D decided to increase the munition dimensions while keeping the weight close to that of the LU 211. The LU 220 with fuse is 940 mm long, compared to the 867 mm of the LU 211, but remains fully compatible with the Caesar and the other 52 cal artillery systems, its mass being between 45 and 46 kg in the Base Bleed configuration, compared to the 43.9 kg of the in-service munition. The diameter being obviously the same, being imposed by the calibre, the extra 73 mm in length allows obtaining a

better aspect ratio reducing the aerodynamic drag hence increasing the range. Moreover, the higher volume of the bigger LU 220 allows for a higher amount of insensitive explosive to be loaded into the round, 11 kg compared to the 8.8 kg of the LU 211, a 25% increase that compensates the inherently reduced explosive power of the XF 13 333 versus the Comp B. Of course the increased weight has limited the range increase, however that decision was taken in full accordance with the French Defence authorities, the DGA and the Army technical services as well as the feedback provided by operational personnel, who clearly stated that priority one was the increase of the terminal effect on the target. Another plus of the LU 220 over the LU 211, is that the new munition is designed to accept deep intrusion fuses and can therefore be fitted with precision guidance fuses, as i.e. Northrop Grumman's PGK (Precision Guidance Kit).

Nexter signed an agreement with Northrop Grumman, the two companies working together to get ready to propose its new round on the export market fitted with the PGK, the compatibility with such type of fuse allowing of course customers to eventually chose other course correction fuses available on the market.

EXT PE6B  
D200

The first iteration of the LU 220 will be based on a conventional steel body providing a natural fragmentation effect. However, Nexter Arrowtech is already looking at a further evolution, that will have a body obtained with 3D printing and will include preformed fragments. "Currently, we manage the technology, which is however not enough mature under many aspects, which leads to a cost per shell unacceptable on the market, we intend to pursue our goal in the future," a company source told EDR On-Line. "As for the munition with the conventional shell, we intend to finalise its development in order to be able to propose our new ammunition to some selected customers, including the French Army, answering the request for conventional artillery munitions with a further extended range," he added, underlining that tests were carried out in which the LU 220 reached 44 km, compared to the 40 km of the LU 211. This shows that even giving priority to the amount of explosive carried, hence the terminal effect, the better aerodynamics of the new round overcompensated the higher weight, allowing a +10% in range in the very first tests.

"The development study for the DGA is now finished, and we are awaiting the DGA to provide us reports on terminal effects," a Nexter Arrowtech representative tells EDR On-Line, "and we are now aiming at launching as soon as possible a full development programme, full product availability being forecasted in 30 months time." ■

# GOODBYE MMP, WELCOME AKERON

By VALERIO DEL GRANDE

**S**oft-MBDA, the European missile company, has renamed its medium-range antitank missile, the MMP (Missile Moyenne Portée); with the development of longer range missile that will equip the Tiger Mk 3 now well underway, known until now with the acronym MHT (Missile Haut de Trame). The company then decided to put all its land-related missiles under the same name, Akeron. This name comes from the ancient Greek, ἄκρον or ákron, which means the summit, indicating that these missiles are the top of what is available.

The MMP, therefore, becomes the Akeron MP, for Moyenne Portée or medium range. This fifth generation missile is in service with the French Army and has already been deployed down-range, while a cooperation is ongoing with Saab for the development of an MMP-based missile, the Swedish Army having fired the MBDA missile in late 2021 for testing.

First deployed in operation in Mali in late 2018, the Akeron MP weighs 15 kg, has a range of 4-5 km, is guided by an IR seeker



EXT PE6A  
D 371

with TV images and can penetrate over 1,000 mm of rolled homogeneous armour.

As for the MHT, now known as the Akeron LP, for Longue Portée or long range. MBDA is quiet on this weapon performances, declaring a range of 8-10 km. A Beyond-line-of-sight weapon's, it will be integrated on the latest version of the Franco-German helicopter, and has IR, TV and laser guidance. According to latest information, MBDA is working on a vehicle-mounted version, which will provide land forces with a longer-range munition. A mock-up of the Akeron LP is exhibited on the MBDA stand. ■

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# UNE RADIO LOGICIELLE ENCORE PLUS PRÉCISE EN PNT

HALL  
5A  
STAND  
C 523

Par JEAN-MICHEL GUHL

**C**ollins Aerospace, généralement mieux connue pour ses productions aéronautiques, présente une version au goût du jour de sa nouvelle radio logicielle AN/PRC-162(V)1 destinée aux plates-formes terrestres. Apte à être montée dans n'importe quel véhicule aussi, il s'agit d'une radio terrestre de communication en réseau bicanal offrant une grande variété de fonctions. Celles-ci comprennent des formes d'onde multiples - à bande étroite et à large bande en 30-88, 225-450, 1250-1450 et 1755-1850 MHz - des communications mobiles ad hoc en réseau à haut débit, des données point à point, de la voix, des SATCOM de nouvelle génération ainsi que les dernières communications en forme d'onde IP disponible sur le théâtre.

Le PRC-162 fait partie de la famille de solutions de communications en réseau TruNet, qui comprend des radios aéroportées et portatives, des formes d'onde avancées et en réseau, des applications, des accessoires, des services et un soutien. TruNet est la première solution de Collins à assurer une connectivité sécurisée entre les éléments terrestres et aéroportés dans tout l'espace de combat.

Il s'agit surtout d'une radio qui se double d'un récepteur GPS militaires à code M assurant une solution de Positionnement, de Navigation et de synchronisation Temporelle (PNT) fortement cryptée. Détail qui ajoute à ses qualités militaires intrinsèques.

Cette gamme comprend des

plates-formes mobiles de synchronisation et de chronométrage de mission compatibles avec le code M, telles que la solution de référence de temps et de fréquence résiliente SecureSync IDM, le premier serveur de temps approuvé par l'Agence des systèmes d'information de la défense américaine (Defense Information Systems Agency - DISA), et la plate-forme PNT mobile Versa pour répondre aux exigences robustes en matière de taille, poids, puissance et coût (SWaP-C).

Rappelons que le code M est un signal militaire utilisé dans les bandes GPS L1 et L2 des satellites NavStar Block IIR américains ou Galileo européens. Il est requis pour les opérations militaires de l'OTAN. Le code M est notamment conçu pour

renforcer les capacités PNT et améliorer la résistance aux menaces existantes et émergentes pour le GPS, telles que le brouillage et l'usurpation (spoofing) susceptibles de détourner ou d'obérer un signal hertzien. Les avantages opérationnels du code M sont les suivants :

- un signal de plus grande puissance qui offre une meilleure résistance au brouillage et aux interférences
- des fonctions de sécurité avancées pour empêcher tout accès ou exploitation non autorisés
- des formats de message et des techniques de modulation du signal améliorés pour des performances plus rapides et plus précises. Ce matériel fonctionne sur batterie ou sur le circuit 28 v de n'importe quel véhicule. ■

## SHERPA SCOUT MORTAR CARRIER FROM ARQUUS, NTGS AND THALES

By VALERIO DEL GRANDE

HALL  
5A  
STAND  
F-F 281-181

**T**ake an armoured vehicle in its pick-up version, add an auto-laying mortar platform, and fit it with the longest-range western 120 mm barrel, and you get a lightweight indirect fire effector capable to carry out shoot-and-scoot missions. Considering its dimensions and weight it is not only capable to move quickly on the ground, but it can also be moved rapidly by air to redeploy it together with light infantry units.

It is what Eurosatory visitors can see at the Arquus stand. The Mobile Protected Mortar System (MPMS) is based on a Sherpa Scout chassis, with its 4-doors protected cabin. On the flatbed we find the deployable mortar system by New Technologies Global Systems (NTGS) of Spain; when a firing mission is called, the platform rotates and the mortar is lowered on the ground, avoiding any type of criticality due to recoil forces on the vehicle

suspensions. On one side of the flatbed a cabinet hosts an auxiliary power unit that powers the hydraulics used to deploy the mortar, another cabinet hosting ammunition and charges, up to a maximum of 40 rounds. The MPMS is fitted with the Vali-ECS fire control system; in the solution on show the computer interface with the FCS is located in the cabin in front of the commander seat, firing data being added manually or automatically, depending the level of system integration into the fire network. The Sherpa Scout being rated at 11.5 tonnes GVW, the payload allows to install a light RCWS for self-defence on the cabin roof. ■



ELECTRONICS & DEFENSE

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# DANGEROUS UNKNOWN ANIMAL SIGHTED AT EUROSATORY

By VALERIO DEL GRANDE

EXT PE6B  
F-F STAND  
241-242

Its name is not yet known, but its ferocity is quite obvious, considering its 130 mm gun. Rheinmetall will announce its name on Day 1 of the exhibition, so for the time being it is known as KF51, the number indicating it falls into the 50 tonnes class, quite probably closer to 60.

It reuses the Leopard 2 hull, fitted out with new electrics, electronics, crew stations, etc, coupled to a wholly new turret, which weight is similar to that of the Leopard 2A6, the whole tank being fitted with a new digital backbone

which respects NGVA standards.

At the rear of the turret we find the automatic ammunition loading system, a must considering the ammo weight. The central part is the loading system that takes the ammunitions from two side magazines containing 10 rounds each. These are modular, so one can be replaced by a module containing four loitering munitions. Beside standard optronic systems, situational awareness is enhanced by four UAS integrated in the turret, two per side, with a 1 km range, espe-

cially useful in urban areas. The turret hosts the commander and gunner, the hull hosting the driver front right, and has an optional place for a fourth crewmember front-left. This can be the platoon commander or an operator managing UGVs, the "loyal wingman" concept being considered, with unmanned ground systems to increase the tank situational awareness and lethality.

As said the gun is the new Future Gun System 130 mm by Rheinmetall which is in its second iteration and aims at de-

livering 18-20 MJ on the target using APFSDS rounds, around 50% more than latest generation 120 mm APFSDS. A 12.7 mm coaxial machine gun is hosted in the turret.

Coming to protection, this is based on three layers; active protection suite protects against antitank missiles and kinetic energy threats, reactive armour package would neutralise double shaped charge rounds that got through, and finally passive armour will stop remaining elements of KE rounds. A top attack protection system is also integrated into the KF51. ■

# SAFRAN EUROFLIR™, A FAMILY OF ELECTRO-OPTICAL SYSTEMS FOR MULTIPLE APPLICATIONS

By MARC CHASSILLAN

HALL 6  
STAND F 70  
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# VISIOLOC: NO MORE NEED FOR GPS, SOPHIE WILL DO FOR IT

By VALERIO DEL GRANDE

HALL  
H 5A  
STAND  
J 801



Jamming and other methods denying GPS have always been taken into consideration, theoretically; now the war in Ukraine shows that it is not theory, it is reality. No way to use GPS positioning, according to more than one report.

At Eurosatory 2022, Thales brings a solution to positioning and accurate target location when GPS signals are not available. Known as VisioLoc, it is a new functionality that is being added to the latest members of the Sophie multifunctional targeting and observation systems, the Ultima and the Op-

tima, the former fitted with a cooled thermal sensor, the latter having an uncooled microbolometer. Beside the TI, the two Sophie have a direct view optic, ensuring optimal view even when batteries go off, a daylight video channel, a laser rangefinder and, obviously, a GPS.

By inserting a Micro SD card, it is possible to load into 4th generation Sophie a map covering 200x200 km with a 0.5 m resolution. If the GPS is jammed, the soldier can find on the map the area where he is staying, and identify on the ground three relevant fea-

tures that can be seen also on the map. He aims at the first, measures the distance, and correlates this with the map, obtaining the features grids as well as its distance from his point of station. He does it with the other two, the system drawing virtual circles centred on the features, and the radius being the respective distances, and the interception of those three circles allows calculating the soldier's position, with an accuracy similar to that given by the GPS, the whole process being done in 2-3 minutes. Adding a panoramic high resolution photo inside the So-

phie, and taking the points as references, it is possible to find the coordinates of any point referring to single pixels, with a much higher accuracy compared to what can be done with a magnetic compass.

Targeting, finding friendly positions when also those are GPS-denies, update your own inertial platform with an accurate positioning to cancel the accumulated drift, are only some of the operations allowed by VisioLoc. Designed with inherent growth potential in computing power, VisioLoc might well not be the last addition in terms of functionalities. ■

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## A WILDER (AND LIGHTER) ARMOURED VEHICLE BY PLASAN

By VALERIO DEL GRANDE

HALL  
6  
STAND  
J 527

**C**ompact, light and well protected, with some firepower; these are the key design elements considered by Plasan when it started working on what should bring back a utility vehicle to the Willis jeep dimensions, but with a good level of protection.

With a GVW of 4,500 kg, and an 800 kg payload, the Wilder is 4.39 m long 1.934 m wide

and 2.093 m high. Its architecture differs from conventional vehicles; the engine is located at the centre, in the lower part, which keeps the centre of gravity very low, hence its capability to drive on a 54% side slope. The Cummins Euro 3 turbodiesel provides 161 hp, for a power-to-weight ratio of 36 hp/t, and is coupled to an 8-speed automatic gearbox. A peculiar arrangement of the differentials allows a consider-

rable wheel travel, 320 mm, the Wilder being fitted with coil over shock absorber suspensions, Plasan saying that its off-road mobility is comparable to that of a racing buggy. Maximum speed is however limited to 120 km/h for safety reasons. As standard, only the front axle is steerable, but as option the rear can also be made steerable.

The driver seats at the front

centre and has a 180° field of view, three seats being in the back, the central one for the RCWS operator, while side ones enjoy a good external view. The Wilder is proposed with STANAG Level 2 protection, but some add-on armour can be considered. A flatbed at the back allows transporting a NATO pallet size load. Thanks to its drive-by-wire system, the Wilder can be fitted with a remote control system. ■

## COBHAM SATCOM LAUNCHES TACTICAL TRACKER IN EUROPE

By GILES EBBUTT

Cobham Satcom has developed a new family of satellite communications antenna terminals for multi-orbit satellite connectivity and is showcasing these publicly for the first time outside the United States at Eurosatory 22.

Stand K 248  
Hall 6 in the  
Danish  
pavilion



The Tactical TRACKER TT X-Y Ka-Band antenna terminals are designed to enable a new range of services and applications, utilizing both geostationary orbit (GEO) and medium/low earth orbit (MEO/LEO) satellites, and combine high performance and reliability with ease of installation and use. They are particularly suitable for forward command centres.

There are three terminals of different sizes in the family:

1.3m, 1.5m and 2.6m, but all share the same characteristics.

The Tactical Tracker is designed to meet RF, pointing and performance specifications for LEO/MEO/GEO networks and operators and are operator agnostic. Users can quickly switch between satellite orbits and operators. The X-Y Axis pedestal provides excellent high-speed performance for multiple applications, including rapid re-

trace to enable "break before make" single antenna, single modem topology on MEO.

Christian Strstrup, Director, Land Marketing, explained that usually two antennas are required to maintain connectivity when switching between LEO/MEO satellites, but the Tactical TRACKER's technology overcomes this. It results in a significant reduction in the resources required for a deployed command centre.

The antennas are transported in three cases, each of which can be moved by two persons, and assembly time to satellite acquisition ready is less than 20 minutes.

The servo systems provide full motion control for continuous operation designed for high duty cycle LEO/MEO satellite tracking. The parabolic dish is a 9-piece segmented carbon fibre composite reflector and a high-performance servo control system. ■



# TYRON INTRODUCES NEW MILITARY VEHICLE RUNFLAT SOLUTION

By DAVID OLIVER

Tyron is exhibiting at Eurosatory on Stand E700 in Hall 5A

**T**yron Runflat's innovation in developing run flat solutions is further enhanced with the launch of the new All-Terrain Rubber (ATR) EasyFit. The new solution is designed to sit between Tyron MultiBands and full ATR-MP and ATR-SP all terrain rubber runflat systems currently supplied widely into the defence marketplace.

The new ATR-EasyFit fills a significant gap in the market

for lightweight rubber runflat solutions for light armoured vehicles running on 16 inch wheels right through to 22.5 inch wheels used on military and commercial logistics vehicles.

"Lightweight 4x4 vehicles with standard wheels are used for multiple critical military and security applications including special forces, border guard and small logistics vehicles and trailers," Peter Simson, Director, Tyron Runflat, said. "Many of these vehicles are operating with no protection against tyre strike or rapid deflation, leaving the occupants at risk.

"The ATR-EasyFit is designed to give these vehicles a low-cost, simple to install safety boost that allows vehicles to keep moving following tyre deflation or puncture so that they can return to base safely." The options for vehicles of this type were previously limited to MultiBands or full, multi-piece runflat systems. The ATR-EasyFit provides a new cost-effective, lightweight option for this vehicle profile, combining the mobility advantages of the multiband with the shock-absorbing benefit of rubber runflats.

The system has a steel core for strength, with a rubber outer

that gives protection against kerb strikes, road debris and uneven terrain. It is based on a carbon ratchet system to reduce weight, and its preconnected cabling design allows it to be fitted without specialist tools and equipment for simple fit and removal in the field. The ATR-EasyFit offers up to 50 km runflat capability, allowing the vehicle to maintain mobility during and after a tyre strike event and continue moving to a place of safety with one or more tyres deflated. To go with the new EasyFit system, Tyron will also be showcasing a new 18 inch high load Toyota LC300 wheel at Eurosatory 2022. ■

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# L'HYPOTHÈSE D'UN CONFLIT MAJEUR POUR NOTRE PAYS EST À NOUVEAU CRÉDIBLE

Par JOSEPH ROUKOZ



**Enjeux du salon Eurosatory pour l'armée de Terre, influence de la guerre en Ukraine sur les programmes Scorpion et Titan, importance de l'artillerie et des drones dans la guerre moderne, perspective d'une défense européenne... Le général Pierre Schill, chef d'état-major de l'armée de Terre française, a répondu à nos questions lors d'un entretien exclusif.**

**Mon général, quels sont les enjeux du salon Eurosatory 2022 pour l'armée de Terre française ?**

Après quatre années d'attente, la tenue de cette édition 2022 est tout d'abord une satisfaction. Eurosatory offre un cadre privilégié pour échanger et réfléchir aux enjeux de défense. Cette année, le salon ouvre ses portes dans le contexte très particulier de l'offensive russe en Ukraine. L'Europe connaît un épisode de paix durable. Nous appartenons certainement à l'une des générations les plus riches de l'histoire et notre continent constitue l'un des espaces les plus riches du globe. Beaucoup pensaient pouvoir fermer les yeux et ignorer les menaces qui pesaient

sur cette opulence, en venant à se demander : « Une armée de Terre, à quoi bon, en somme ? » La guerre est désormais une préoccupation quotidienne et le conflit qui se déroule en Ukraine confère une dimension nouvelle au salon.

L'hypothèse d'un conflit majeur pour notre pays est à nouveau crédible. Étant donné l'ampleur des destructions de matériel observées, en quelques mois de conflit, la régénération des équipements apparaît comme un des enjeux de la guerre. Je vois deux défis : celui du seuil – disposer, par exemple, du nombre de blindés suffisant pour s'engager – et celui du palier – disposer de ces blindés sur la durée. Les armées ne relèvent pas seules ces

défis. C'est pourquoi les échanges entre armées et industriels sont primordiaux au cours du salon.

**Dans quelle mesure les événements en Ukraine peuvent-ils influencer le programme Scorpion ou le projet Titan (dont les résultats devraient être visibles à partir de 2030 et dans les décennies suivantes) ?**

Les événements en Ukraine confirment que l'ambition de *Supériorité opérationnelle* adoptée par l'armée de Terre pour son plan stratégique est bonne. L'objectif est de forger l'armée de Terre dont la France a besoin, apte à s'engager dans tous les conflits jusqu'à l'engagement

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majeur. Ce plan vise notamment à disposer des capacités permettant à nos soldats de surclasser leurs adversaires.

Le programme Scorpion, première phase de la modernisation de l'armée de Terre, se poursuit et le projet Titan, qui en sera la phase suivante, conçoit de manière coordonnée et cohérente les capacités futures à l'horizon 2040. Depuis l'automne 2021, avec le déploiement des Griffon au Sahel, Scorpion est une réalité opérationnelle. Nous ne sommes pourtant qu'aux pré-mices de ce programme : seulement 10 % des livraisons totales ont été réalisées à ce stade. L'année 2022 est une année capitale pour la poursuite de ce mouvement à cheval sur deux Lois de Programmation Militaire (LPM) : les livraisons à venir permettront d'atteindre 18 % de la cible Scorpion en fin d'année 2022 et de commander 500 véhicules blindés supplémentaires, représentant une nouvelle tranche de 15 % du total des véhicules du programme.

Les enseignements du conflit ukrainien permettent d'identifier certaines capacités limitées ou à acquérir. Il est ainsi impératif de renforcer les capacités de gestion de la troisième dimension aéroterrestre dans la grande profondeur tactique, ce qui repose sur l'efficacité du triptyque capteur / effecteur / boucle décisionnelle. Les moyens de la défense sol-air, de la lutte anti-drone et de la contre-batterie sont indispensables.

#### **Quels enseignements tirez-vous de la guerre en Ukraine et comment sont-ils pris en compte par l'armée de Terre, notamment dans sa préparation opérationnelle ?**

Au cours des dernières décennies, en Afghanistan, en République centrafricaine et au Sahel, l'armée de Terre a acquis une grande expérience opérationnelle. Durcir l'armée de Terre ne signifie pas remettre en cause cette expérience,

mais se mettre en capacité de franchir une marche supplémentaire et se préparer à des combats plus durs, face à un adversaire plus dangereux.

Le plan *Supériorité opérationnelle* repose sur l'objectif de disposer des hommes à la hauteur des chocs futurs. À mon sens, c'est fondamental.

Selon certaines estimations, entre 30 000 et 40 000 soldats russes ne seraient plus en état de combattre. Au-delà des pertes humaines, il faut imaginer l'impact non seulement au sein des unités mais aussi sur la société russe. Même les sources d'information accessibles au grand public permettent de constater que les forces morales de certaines unités russes ont pu être entamées, contribuant à des revers tactiques cuisants. En contrepoint, nous savons que la cohésion et le soutien national ont donné aux unités ukrainiennes un surcroît d'efficacité opérationnelle. Ces éléments nous rappellent toute l'importance de l'aguerrissement, du réalisme et de l'intensité de l'entraînement, du sens donné à la mission et de la confiance dans le commandement qui repose sur la qualité de la formation dispensée dans nos unités et nos écoles militaires.

Par ailleurs, il est possible de constater les effets de la guerre de l'information sur les soldats et les opinions à travers l'utilisation d'images de prisonniers voire de familles. Déjà en 2014, des familles de soldats ukrainiens d'une même unité avaient reçu simultanément un SMS annonçant leur décès, suscitant des appels en retour de ces mêmes proches, permettant ainsi, par la concentration de signaux, de repérer leur position pour déclencher des tirs d'artillerie. Durcir l'armée de Terre, c'est durcir l'ensemble de la « communauté Terre » et protéger aussi les familles, jusque dans leur environnement de défense numérique et leur protection contre la subversion.

La guerre est un phénomène social. La vo-

lonté politique et le soutien de la population constituent le substrat d'une armée. L'armée de Terre accroît également ses capacités d'action dans les champs électromagnétique et informationnel, dans les milieux terrestre, aérien et cyber, en particulier par le déploiement de ses drones et par la recherche d'une combinaison toujours meilleure des effets interarmées. Dans ce cadre, les capacités de ciblage – acquérir le renseignement, frapper dans la profondeur, évaluer – font l'objet d'une attention renouvelée.

Enfin, l'armée de Terre s'entraîne à opérer dans des environnements dégradés, sans disposer en permanence de la supériorité aérienne ou informationnelle et dans des conditions techniques volontairement réduites à fins de « leurrage ».

L'ensemble de ces actions concourent à la préparation d'un combattant plus aguerri, apte à s'engager dans des conditions opérationnelles proches de celles du conflit ukrainien.

**Dans le cadre du programme Scorpion et dans l'attente de son successeur MGCS, le char Leclerc fera l'objet d'une « revalorisation ». Quelles seront les caractéristiques de ce futur char de combat ?**

Entré en service au début des années 1990, le char Leclerc est en cours de revalorisation. Il s'agit d'intégrer le char dans la bulle d'infovalorisation Scorpion et d'améliorer ses performances, notamment dans les domaines de la protection et de l'agression. Cette rénovation, qui intervient en « milieu de vie », doit permettre également de maintenir le Leclerc opérationnel jusqu'à l'arrivée de son successeur MGCS.

L'actualité confirme que la capacité « char de bataille » demeure indispensable pour nos engagements les plus durs, car elle détermine l'aptitude au combat de rencontre et à la reprise de l'initiative.

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Tout en tenant compte de la dialectique de l'épée et du bouclier dans la décennie à venir, le char Leclerc sera doté de nouvelles capacités d'agression et de protection. Son successeur, MGCS, ne sera pas un « simple » char mais un « système de systèmes » constituant une approche nouvelle de l'architecture du combat de contact. Il pourrait ainsi être composé de plusieurs plateformes, portant des effecteurs différents (canon gros calibre, missile...), certaines inhabitées et accompagnées de capteurs aériens déportés. MGCS ouvrira la voie à de nouvelles capacités militaires en termes d'effets, de robotisation et de blindage. En outre, la configuration en tant que « système de systèmes » permettra l'intégration de nouvelles technologies qui se développeront au cours du 21e siècle. Enfin, le coût et les contraintes d'emploi du MGCS devront être maîtrisés.

#### **La guerre en Ukraine révèle les capacités de l'armée russe dans le domaine de l'artillerie, employées de manière intensive. Quelles sont les évolutions de l'artillerie française à venir ?**

En premier lieu, je veux souligner la très grande qualité de l'artillerie française. Son efficacité a été illustrée en Irak de 2016 à 2019 contre l'organisation Daech, avec plus de 20 000 coups de 155 mm

tirés, pour des effets décisifs sur les dispositifs ennemis et maîtrisés sur l'environnement. Même si cela est un peu plus ancien, l'apport de notre artillerie longue portée a aussi été déterminant pendant l'opération Serval au Mali en 2013. Ces effets sont produits par les équipements dont nous disposons, Caesar et LRU, mais aussi les doctrines, l'entraînement, les chaînes de commandement et surtout les hommes qui les servent.

La modernisation de notre artillerie a été initiée dans le cadre du programme Scorpion et elle se poursuivra dans le futur avec Titan. Les premières livraisons des Griffon Mepac, embarquant du mortier de 120 mm, interviendront en 2024. Ces véhicules donneront aux unités Scorpion une souplesse encore accrue en termes d'appui-feu. Ils seront particulièrement réactifs, aptes à réaliser des tirs complexes, avec des délais de mise en œuvre extrêmement réduits et une cadence de tir élevée pouvant aller jusqu'à dix coups par minute par système. Quant aux Caesar de nouvelle génération, ils seront réceptionnés à l'horizon 2025. Par rapport aux Caesar actuels, ils présenteront une protection renforcée et une mobilité améliorée. La précision de leur canon, déjà remarquable, devrait également encore être optimisée. La capacité de tir du Caesar NG sera diversifiée avec l'arrivée d'une première munition de précision, autorisant une souplesse d'emploi du Caesar en environnement urbain, par exemple.

Des travaux sont en cours pour définir l'avenir de l'artillerie longue portée. L'évolution de la conflictualité souligne le besoin d'une modernisation rapide de cette composante. Dans un contexte de généralisation des dispositifs *anti-access area-denial* (A2AD), il s'avère indispensable d'être en mesure d'effectuer des tirs dans une plus grande profondeur, avec une quantité accrue de lanceurs, pour faconner l'adversaire et le mettre à portée des unités de mêlée avant le choc du combat de contact. La capacité future pourra aussi participer davantage aux frappes interarmées, pour briser des dispositifs adverses communs à l'échelle du théâtre des opérations. Elle facilitera ainsi l'engagement des autres composantes, permettant par exemple, par des frappes précises dans la profondeur sur la Défense Sol-Air (DSA) adverse, de réduire la vulnérabilité de la composante aérienne. Les capacités d'acquisition d'objectifs seront modernisées en cohérence avec l'introduction de ces nouvelles capaci-

tés de frappe d'artillerie. Le drone SDT, en particulier, complétera les capacités existantes, de contre batterie (Cobra) ou de recherche humaine, par exemple, elles aussi en cours de modernisation. La frappe longue portée future s'appuiera aussi sur les capacités de renseignement interarmées, comme les forces spéciales et l'imagerie spatiale.

#### **L'artillerie participe à la préservation de la liberté de mouvement des unités de manœuvre et il est possible de constater que la DSA, en particulier, contribue à créer ce que les Anglo-saxons nomment l'A2AD. Quels sont les enjeux de l'A2AD ?**

Face à l'évolution de la menace aérienne et au rôle croissant joué par les drones, la DSA, notamment basse couche, redevient un élément clé de la préservation du potentiel de combat et plus largement de la liberté d'action de la composante terrestre. Les récents conflits l'ont montré. Durant le conflit dans le Haut-Karabakh, les forces arméniennes ont été confrontées à une combinaison efficace de mini-drones, de drones tactiques armés et de munitions téléopérées. Très bien intégrée dans la manœuvre azérie, cette combinaison de capacités a permis la neutralisation de la DSA arménienne composée de systèmes non optimisés contre ces menaces. Elle a aussi contribué de façon déterminante à briser leurs lignes défensives, en particulier par le guidage de tirs d'artillerie et par des frappes de précision au contact et dans la profondeur.

En Ukraine, le socle de la défense aérienne ukrainienne - systèmes fixes de surveillance aérienne du territoire, bases aériennes - a été ciblé dès les premiers jours du conflit par des frappes de missiles de croisière et balistiques. Des unités de manœuvre russes comme ukrainiennes non couvertes par de la DSA ont été neutralisées sur des axes routiers par des hélicoptères de combat et des avions d'appui aérien rapproché adverses. Des drones de toutes natures ont été utilisés pour guider des frappes sur les forces au contact comme dans la profondeur.

Notre défense sol-air, notamment basse couche, doit aujourd'hui être modernisée et complétée. Les travaux en cours sur ce sujet, menés avec l'état-major des Armées (EMA), les autres armées et la Direction Générale de l'Armement (DGA), s'attachent à en définir le calendrier et l'articulation future. Sa performance reposera non seulement sur la qualité de ses composantes détection, coman-

dement et neutralisation, mais aussi sur le nombre de systèmes déployés. La menace aérienne à basse altitude étant décuplée par l'emploi des drones, ce domaine de lutte devient primordial. Au-delà de la performance, une attention particulière sera portée à la soutenabilité financière des solutions qui constitueront cette défense sol-air basse couche future, y compris contre des menaces saturantes à bas coût. La DSA future devra, en quelque sorte, rétablir une rationalité économique entre le coût de l'attaque (ou de l'observation à fin d'action) et celui de la défense. Des technologies prometteuses y contribueront, comme les armes à effet dirigé, qui compléteront avantageusement à terme le couple canon-missile.

**Les drones tactiques armés se sont révélés un outil essentiel dans les combats de haute intensité. Au vu des usages et des capacités des drones employés lors de la guerre russo-ukrainienne, l'armée de Terre envisage-t-elle de revoir ses programmes de développement de drones et de renforcer ses capacités sur ce plan ?**

Depuis déjà plusieurs années, l'armée de Terre anticipe le retour des conflits de haute intensité et se prépare à l'hypothèse d'un engagement majeur.

Ses objectifs en matière de drones ont été mis à jour en 2019 dans un document « ambition drones ».

Le plan stratégique de l'armée de Terre définit comme objectif la densification de la bulle aéroterrestre qui vise à assurer une intégration cohérente et à grande échelle des drones dans les opérations, notamment par l'établissement de formations adaptées et la prise en compte de la sécurité aéronautique à tous les niveaux.

En effet, si l'armée de Terre met en œuvre des drones depuis 60 ans, la dimension de cet emploi et sa finalité évoluent radicalement. Les drones sont mis en service dans toutes les fonctions opérationnelles de l'armée de Terre, dans le but de constituer une trame complète et diversifiée. Environ 3 000 vecteurs aériens équipent les forces terrestres fin 2023. Les drones les plus petits (nano-drones et micro-drones) assureront des fonctions

de reconnaissance et de surveillance, afin de protéger les unités et de détecter les menaces à la portée de chaque échelon tactique. La guerre en Ukraine confirme le besoin déjà identifié depuis plusieurs années d'acquérir des munitions téléopérées à courte et à longue portée, qui sont des micro-drones dotés d'une charge explosive destinés à se détruire au moment de l'impact contre leur cible. Dans les gammes supérieures des mini-drones ou drones tactiques, celles des drones mis en œuvre par des spécialistes, nous poursuivons un effort de long terme avec des opérations d'armement lancées de longue date. Certains de ces drones tactiques seront armés. Les développements nécessaires sont en cours.

Cependant, les drones ne sont pas devenus l'arme de la suprématie tactique. Des parades existent (défense sol-air, auto-défense) ou se développent très rapidement (lutte anti-drones).

Face à la menace sérieuse que constituent les drones ennemis, des systèmes de défense adaptés sont à mettre en œuvre, notamment en se réappropriant



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Les atouts et les risques des drones sont pris en compte dans le cadre d'une approche globale combinant l'ensemble des composantes tactiques.

**Une défense européenne est-elle encore possible ?  
Une complémentarité entre l'Union européenne (UE) est l'Organisation du Traité de l'Atlantique Nord (Otan) est-elle envisageable ?**

À la fin du mois de mars, Strasbourg a accueilli pour deux journées d'échanges les chefs d'état-major de l'armée de Terre (CEMAT) européens ainsi que le général américain Christopher Cavoli, nommé depuis commandant suprême des forces armées alliées en Europe par l'Otan. Tous les CEMAT ont souligné la prise de conscience provoquée par l'invasion russe dans leur pays. Il y a donc un « moment Ukraine », pour l'Europe en général et pour les forces terrestres européennes en particulier, qui présente des opportunités et des défis. Ce moment se caractérise par des annonces de hausse des budgets et des changements d'échelles : nous pouvons penser à l'annonce historique de Mme Von der Leyen relative au déblocage par l'UE de 450 millions d'euros pour fournir des armes à l'Ukraine. Qui aurait imaginé, il y a seulement cinq mois, que le chancelier allemand annoncerait le déblocage de 100 milliards d'euros, dans l'urgence, pour moderniser rapidement son armée ? Face au retour des États-puissances, il apparaît nécessaire d'agir à l'échelle de l'Europe. « Soit l'Europe fait face, soit l'Europe s'efface », a affirmé Mme Parly. Pour les forces terrestres européennes, une opportunité s'ouvre pour davantage coopérer, accroître l'interopérabilité opérationnelle et capacitaire et contribuer à la défense de l'Europe.

En tant que CEMAT, mon rôle est de proposer, dans une logique *bottom up*, des options militaires au chef d'état-major des Armées, qu'il puisse présenter au Président de la République, et d'assurer la mise en œuvre des décisions prises.

Sur le plan militaire, les leviers efficaces et



concrets pour faire avancer la défense de l'Europe sont relatifs à l'interopérabilité, c'est-à-dire la capacité à planifier, commander, s'entraîner et combattre avec nos alliés. La situation sur le flanc est de l'Europe et aussi dans le sud rend nécessaire de penser « le temps d'après ». Au sud, la situation au Sahel sera une préoccupation sécuritaire pour de nombreuses années. Il s'agit, en effet, de ne pas céder à un effet tunnel ukrainien et de conserver une hauteur de vue stratégique. J'identifie trois axes de progression.

Le premier est celui de l'interopérabilité capacitaire : en ordre de grandeur, il y a en Europe une vingtaine de modèles de chars et d'avions, plus de 150 types d'armement majeurs, sans évoquer la diversité des moyens de transmission qui ne facilite pas l'interopérabilité des chaînes de commandement. L'interopérabilité capacitaire est le premier levier pertinent pour améliorer l'efficacité d'engagements communs. Il existe des exemples de succès dans ce domaine. En 2018 a été signé l'accord portant sur la capacité motorisée (CaMo) de l'armée de Terre belge. Un accord qui comprend deux dimensions : l'achat par la Belgique de blindés français du programme Scorpion (382 VMBR Griffon et 60 chars Jaguar) et une transformation de l'armée de Terre belge symétrique

à celle menée par l'armée de Terre française pour structurer des groupements tactiques interarmes (GTIA) autour du système de combat et d'infovalorisation Scorpion. CaMo et l'élargissement de la communauté Scorpion à d'autres partenaires européens participent sans aucun doute à renforcer l'interopérabilité avec nos partenaires et alliés, et donc la défense de l'Europe, j'en suis convaincu. Ce domaine capacitaire est un espace de progrès à la portée de l'UE.

Deuxièmement, l'interopérabilité des structures et des moyens de commandement militaire : lors du forum des CEMAT européens, un de mes homologues a eu cette formule : « *Il est plus facile de traverser l'Europe pour un individu que pour un convoi militaire répondant à une urgence sécuritaire* », en regrettant les difficultés dues aux normes et à la coordination qui contraignent les mouvements de forces par voie terrestre. C'est peut-être un détail mais, si l'Europe souhaite gagner en réactivité et en crédibilité,

le transfert de troupes et de matériels sur le continent peut être amélioré en développant une capacité de planification voire de conduite des opérations, en renforçant les structures de commandement. C'est ici un domaine de progrès à la confluence des compétences de l'UE - liberté de circulation - et de l'Otan, qui est une machine à créer de l'interopérabilité par la norme et par la procédure.

Enfin, l'interopérabilité opérationnelle : pour combattre ensemble, il faut s'entraîner ensemble et être capable de commander ensemble. Cela a été récemment le cas dans le cadre des exercices *Brilliant Jump* et *Cold Response* qui viennent de se dérouler en Norvège. L'armée de Terre travaille sur la nature de ses exercices pour se préparer à la haute intensité. C'est l'ambition de l'exercice majeur en terrain libre Orion 2023. Ce domaine de l'interopérabilité opérationnelle est le domaine d'excellence de l'Otan.

*In fine*, l'UE et l'Otan permettent à la France de démontrer sa solidarité stratégique sur le continent en répondant aux exigences de ses alliances, accords de défense et partenariats stratégiques, en garantissant notamment sa capacité à s'engager en coalition comme nation-cadre. ■

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# SAAB CARL-GUSTAF: DIGITAL AND FLEXIBLE

By VALERIO DEL GRANDE

At least 15 customers have ordered the latest iteration of Saab Carl-Gustaf 84 mm recoilless gun, the M4, which compared to its predecessors has one major advantage: it is much lighter, weighting at 6.7 kg without accessories. It was also shortened, measuring under 1 meter length, and ergonomics was carefully studied. Designers also introduced a communication system which until now was not exploited, as it needs the right sight and ammunition.

At Eurosatory, Saab presents its Carl-Gustaf M4 with the new Fire Control Device 558, while the HE 448 programmable ammunition is now fully part of the weapon rounds portfolio.

The FCD 558 contains a computer that has in memory the ballistic tables of all usable rounds, and is fitted as standard with a x3 optical sight. Manually selecting the type of round and inputting the distance gives the drop compensation, which also takes into consideration ambient temperature and pressure. The gunner only has to put the crosshair on the target and squeeze the trigger. The FCD 558 will be available in fall 2022, and will become the standard sight for the M4.

However, when using the new HE 448 round, the Carl-Gustaf M4 automatically senses the type of round and switches the sight on its ballistic table through the



Firebolt protocol, while the propellant temperature is provided to the sight computer, further increasing accuracy. From the sight, the gunner can select the fuze mode, and if the HE 448 is to be used in the airburst mode, the time will be set based on the target distance. The round contains 4,000 tungsten 2.5 mm diameter

spheres, compared to the 800 steel 5.5 mm balls of the older HE 441D.

Reduced workload, lessened risk of mistakes when engaged in a fight, increased accuracy. The HE 448 will certainly not remain the only Carl-Gustaf round providing those advantages. ■

# THERMAL IMAGING: SCD INTRODUCES ITS CRANE 5 MM MWIR DETECTOR

By VALERIO DEL GRANDE



**SCD, the acronym standing for Semi Conductor Devices, is an Israeli company specialised in high-end infrared detectors and laser diodes.**

At Eurosatory, it unveils its latest development, the Crane, which according to SCD is the first 5 µm pitch 5 mega pixel Medium Wave Infra Red sensor. To produce such sensor, the company had to develop a new fabrication process that allows to maintain the same performances of its 10 µm pitch sensors. Moreover, the Crane not only allows to maintain the focal plane array dimensions while increasing the resolution, it also allows reducing power consumption as the new sensor is of the HOT (High Operating Temperature) type, working at 150°K rather than at 80°K. This reduces the cooling machine dimensions and consumption, contributing to reduce SWAP (Size Weight And Power), a key factor especially when sensors must be installed on airframes.

With its new sensor, which will allow to have much higher resolution within the same sensor surface, SCD aims at the persistent surveillance market, both military and non military. Nowadays, for "holding" a wide area, multiple platforms are needed, as to get the required image resolution. Currently, daylight CMOS sensors have a 4K resolution, but no equivalent exists in the MWIR field. With its 5 mega-pixel Crane, SCD provides the answer, coupling day and thermal sensors with similar resolutions.

The Crane has started integration with several OEMs worldwide, mostly in Israel and Europe, and SCD started full-rate production just before the opening of the Paris exhibition. The use of the Crane allows to bring very high-resolution systems down to tactical forces, both land and drone-based, another new demand being the Counter-UAS field. ■

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## COMPACITY AND FIREPOWER

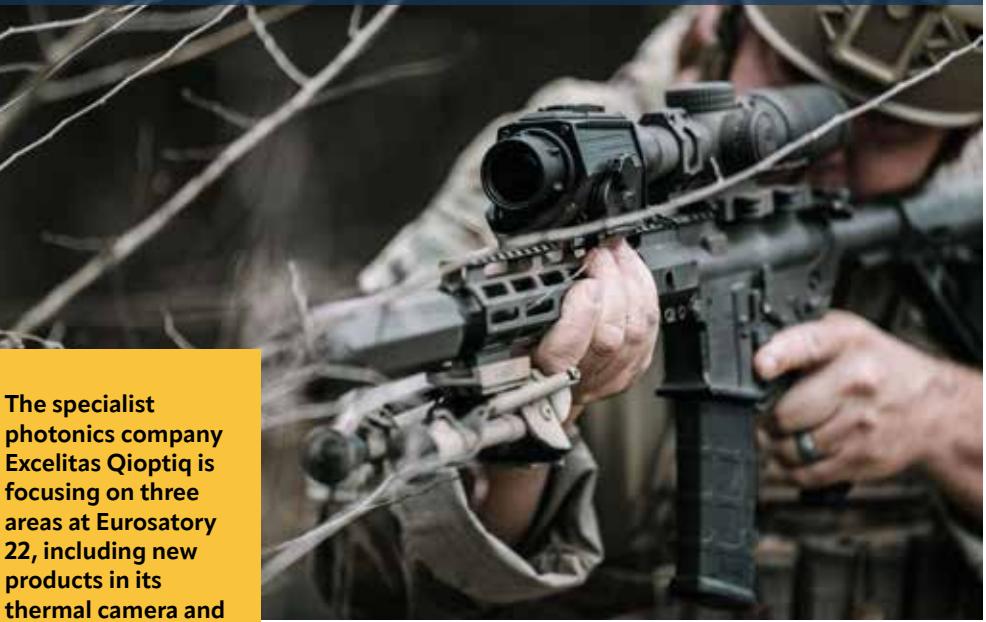
By JEAN-PIERRE HUSSON

HALL  
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STAND  
H 587

Designed to be carried discreetly for prolonged periods, the CSX from Smith & Wesson (USA) is an all-new micro-compact and ultra-light pistol (155mm in total length for a thickness of 28mm and a weight of 553g), chambered for the 9mm Parabellum cartridge (9x19mm NATO standard or 9mm Luger). Equipped with a light alloy frame, the weapon mounts a 3.1 inch (79mm) barrel, made of stainless steel, like the breech cover, both of which are coated with an Armonite anti-corrosion finish. A pistol with a single-action mechanism, the CSX has ambidextrous controls (manual safety, slide catch and magazine release lock), a trigger safety, interchangeable polymer back grip and White Dot front and rear sights for faster target acquisition. Considering its dimensions, the CSX offers exceptional firepower with 12 rounds in the magazine, plus one round that can be manually fed into the chamber. The weapon comes with an additional magazine with a capacity of 10 rounds. ■

## EXCELITAS LAUNCHES NEW OPTICAL PRODUCTS

By GILES EBBUTT



The specialist photonics company Excelitas Qioptiq is focusing on three areas at Eurosatory 22, including new products in its thermal camera and thermal imaging sight ranges.

The new RaptIR long range thermal camera utilises the latest small pixel, high-operating temperature type II super-lattice (T2SL) mid-wave infrared sensor technology to provide a flexible solution for long range surveillance and targeting applications. RaptIR offers vehicle identification at a range of 10Km in a package weighing less than 4.8Kg.

RaptIR uses an 8 μm, high-definition (SXGA), T2SL sensor with a long-life linear cooler; Excelitas's F/3 continuous zoom optics; and its 'Veros' linear drive mechanism which offers fast zoom transitions. This provides optimum imaging, focus retention and boresight performance through the whole 14x zoom range, enabling target acquisition and identification to be achieved in less than .5 seconds.

The RaptIR joins the CheetIR range of mid-wave IR cameras and the CouglIR and PanthIR long-wave IR cameras in the Excelitas thermal camera stable.

The DRAGON-C12 is the latest addition to the Qioptiq DRAGON family of uncooled thermal weapon sights. It uses a low power 640 x 512 12μm thermal core and an intelligent, low power System on Chip (SoC) electronic archi-

ture and weighs 370g. The DRAGON-C12 can be used as an in-line weapon sight with a range of fixed or variable day scopes up to 10x magnification or as a stand-alone weapon sight with a range of operator-selectable reticles, and can also be used as a handheld sight for observation. DRAGON-C12 includes a zoom feature for up to 4X magnification, which can be zeroed to the day scope

A Bluetooth interface provides connectivity for remote setup and control and with a dismounted battle management system such as ATAK. The sight contains a GPS receivers and a 9-axis micro-electromechanical system (MEMS) inertial measurement unit to provide location, heading and orientation.

There will be three variants of the sight: the multi-mission DRAGON-C12; the DRAGON-C12 XR extended range variant; and the DRAGON-A12 tactical range target acquisition system.

Excelitas is also showcasing its range of sensors and detectors, including laser range-finding detectors, laser warning detectors, terminal guidance detectors and pulsed lasers and detectors for proximity fuses. ■

Excelitas Qioptiq are on Stand C788, Hall 5A in the UK Pavilion.

# EXTREMV: ST ENGINEERING ALL TERRAIN VEHICLE FOR DISASTER RELIEF

HALL 5A STAND CB 710

By VALERIO DEL GRANDE

**A**lthough not present in-person on the Eurosatory premises, the ST Engineering of Singapore is proposing its all-terrain tracked carrier, a direct derivative of its military Bronco, as Eurosatory having opened up to the disaster relief and rescue operations world.

It is made of two modules, the front one containing the 200 hp engine coupled with an 8-speed automatic transmission, which activates the tracks of both modules through a hydraulic articulated joint between the two. Overall, it is 7.6 m long, can overcome a 100% slope and travel on a 70% side slope,

with a maximum speed of 60 km/h, and thanks to its architecture has a 7 m turning radius. Amphibious, it is propelled in water by its tracks, the low ground pressure, 17 kPa (0.173 kg/cm<sup>2</sup>) allowing it to travel on soft ground such as sand, snow and mud. With a 10 tonnes GVW, 4 of them payload, it has ample flexibility in terms of configurations.

ST Engineering proposes it with a rear enclosed cabin for personnel transport, a flatbed, a hook lift system allowing adding modular payload, and for fire fighting. The latter configuration, developed in cooperation with DICOSY of Switzerland, sees the rear module



carrying a water tank, hence the ExtremV becomes a high mobility fire fighting platform that can act fully independently, as it does not need to be connected to a water source. In this configuration, the vehicle was acquired by the German Army and Japan also using the

ExtremV. Numerous other applications are foreseen for disaster relief operations: Local Area Network carrier to ensure communications for first responders, medical evacuation, power generation, drone carrier for surveillance and mapping. ■



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# ATN EUROPE LIGHTENS THE DARKNESS

By GILES EBBUTT

ATN Europe, a specialist in low light optical devices, is showcasing its ODIN family of compact thermal monoculars. These incorporate ATN's Obsidian Core technology platform which includes two digital signal co-processors, advanced spatial noise reduction filters and low power 32nm CMOS fabrication technology.

Available with three different lenses the ODIN monocular has a high-resolution 1280x960 pixel display and can operate in white hot or black hot modes. The different lenses (19, 25 and 35mm) provide different levels of magnification and thermal detection capability.

The 19mm ODIN LT320 2-4X provides thermal detection, recognition and identification at 535, 380 and 230 metres respectively, while the 35mm ODIN LT320 4-8X offers 1510, 680 and 340 metres for the same functionality.

The ODIN monocular weighs 285g and is ergonomically designed to be easily manipulated in one hand. It can be used handheld, head-mounted or helmet-mounted. Also on display are the ATN BinoX 4T and BinoX 4K family of binoculars. Incorporating the Obsidian Core the BinoX 4T are thermal binoculars which can operate in black



hot, white hot or colour modes. Also integrated is a laser rangefinder with a range up to 1000m; an infrared illuminator; a video recorder; WiFi dual streaming; and an e-compass. The BinoX 4K binoculars are night vision devices which use the 4K Ultra HD Sensor and the Obsidian Core. They provide the same additional integrated functionality as the 4T.

The MARS 4 series is the latest version of ATN's thermal imaging scope and is an upgrade on the previous Mars-HD thermal scope. The 30mm tube comes in six different variants. It includes a smart range finder; recoil activated video recorder, WiFi stream; ballistic calculator; electronic compass; and one shot zero capability. ■



Taking an airframe with a classic wing and adding to it some rotors that can transform it into a rotorcraft for limited periods of time, allowing for persistent surveillance into areas where loitering UAVs cannot provide it, as well as multiple landing and take-offs in the operational area, and you get what Aeronautics of Israel defines a UHP, for Unmanned Hovering Plane.

The Trojan being unveiled at Eurosatory is the first available UHP, and was developed to fill a gap in the UAS scenario, following discussions with end-users.

Electrically powered, it features a pushing propeller at the rear and four twin-counter-rotating rotors located at the extremity of "X" arranged spikes, a 4.2 m high wing with downwards winglets ensuring

# TROJAN BY AERONAUTICS: THE FIRST UNMANNED HOVERING PLANE DARKNESS

By VALERIO DEL GRANDE

HALL  
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E 752

lift when moving at speed. With a 45 kg MTOW, it can carry up to 12 kg, allowing considerable flexibility as modern optronic gimballed systems containing day and night channels weigh less than 6 kg, the extra weight allowing to add other payloads. Maximum speed is 25 m/s, a typical mission profile considering roughly of 80% of levelled flying and 20% of hovering, with a 2.5 hours endurance and a 150 km range, data-link range

being 40 km. A four-leg fixed landing gear ensures that winglets do not touch the ground at landing. However, Aeronautics has developed and is close to patent a proprietary system based on on-board sensors capable to identify the optimal landing site taking into consideration the ground and other parameters. Easy to fly, users will not be pilots but soldiers - the Trojan is ready for production. ■

# RAFAEL INTRODUCES THE SPIKE NLOS MISSION TASKFORCE

By VALERIO DEL GRANDE



**R**educing the sensor-to-shooter timeline has become a must in current war scenarios, where things evolve at a very quick pace. Considering new threats, Rafael of Israel has leveraged its considerable experience and wide portfolio, to create what it has defined "Spike NLOS Mission Taskforce" or Spike NMT in short. The Haifa-based company proposes a complete and comprehensive solution for operational needs that includes wit-

hin the unit all required elements, from organic reconnaissance, to command and control, and finally to attack capabilities.

The Spike NMT solution is based on the Spike NLOS, the 32 km range missile that incorporates a dual sensor and a data link, allowing to engage beyond-line-of-sight targets at day or night. The engagement starts with the detection by NMT UAVs of the enemy threat using their sensors, the target is relayed to the command and control system exploiting Rafael BNEN software defined communications network. Here the brain of the system takes a decision in a very short time, thanks to the use of artificial intelligence, data fusion, and autonomous technologies. It exploits the Battle Management System installed in the command and control center as well as Rafael's Fire Weaver.

The Fire Weaver is key in reducing the sensor-to-shooter timeline, as it connects all the players on the battlefield, linking all sensors to all shooters, generating a networked attack system that constantly calculates the optimal shooter for each target, allowing also simultaneous engagements.

Quickly deployable, all elements can be mounted on mobility platforms, the Spike NMT can be made ready in a matter of minutes, and is therefore particularly suited to counter rapidly changing battlefield scenarios. ■

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## ASSERTIVE CHOICE DOMINANT PLAY

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# IWI: THE MASADA GOES SLIM

By VALERIO DEL GRANDE

HALL  
6  
STAND  
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It is difficult to imagine a gap into the wide portfolio of Israel Weapons Industry, the company belonging to the SK Group specialises in firearms. In fact there was one, and the company based at the northern outskirts of Tel Aviv decided to fill it. At Eurosatory IWI is presenting its Masada S, the last letter standing for "Slim" as this handgun falls into the sub-compact category, while maintaining most performances of bigger semi-automatic pistols.

It maintains the same name, Masada, of its big sister, but the inside mechanism is completely different albeit it is also a striker-fired pistol with polymer frame. One of the different features is the trigger mechanism, which pull is between 2.5 and 3.2 kg. The trigger assembly is marked with the serial number and can be easily removed for easy cleaning. Lighter than the Masada, 576 grams without magazine versus 650 grams, it has a shorter barrel, 3.4" (87.5 mm) versus 4.1" (104 mm),

which allow reducing the total length from 189 to 159 mm. The new IWI handgun is around 25 mm thick, hence the "Slim" surname.

The full-hand pistol grip with beaver tail allows instinctive aiming, a front white dot and a rear U-shaped sight provide quick aiming, re-aiming being easy task also due to the dual

recoil springs that reduce perceived recoil. But the key point is the 13 + 1 rounds carried by this easily conceivable pistol only 4 less than its full-size sister.

The Masada S is already available, IWI considering it a first class tool both for law enforcement agencies and military units. ■

## NEW AEGIS CASE RANGE

By DAVID OLIVER

Leaffield Cases are back at Eurosatory showcasing their rotationally moulded Aegis Cases range. Leaffield Cases, a division of Leaffield Environmental is a UK designer, manufacturer and supplier of rugged, protective, plastic waterproof cases.

Formerly known as Linpac Environmental, the company has many years experience in the production of custom cases and packaging. From rotomoulded transport cases, large ruggedized cases and military transport cases, whatever your requirements are. Aegis ruggedized cases

are extremely durable. They are UV and impact resistant and have a longer useful lifespan than comparable wooden or aluminium cases that are more susceptible to impact damage. Aegis case durability reduces acquisition and disposal requirements.

Case latch breakage is possibly the most common reason that cases become unfit for use. Latches on Aegis Cases can be replaced in the field without piercing the case envelope, so extending the life of the case significantly.



Lightweight Aegis case equates to fuel savings in Returnable Transit Packaging applications.

Visitors to Eurosatory will get the chance to see their lightweight IP67 rated cases, that has been manufactured using cutting edge design and

materials technology. The Aegis Cases are engineered to meet the most rigorous performance specifications under the most severe environmental conditions. The modular design offers the flexibility to deliver bespoke sizes for specific products for the defence industry. ■

The team will be available to demonstrate the features and benefits of the Aegis Cases on **stand B788 in Hall 5**.

# MENATEK ADDS EWS-M WEATHER SENSOR TO ITS PORTFOLIO

By PAOLO VALPOLINI

HALL  
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A technology company specialised in main systems and subsystems for vehicles, such as suspensions, brake systems, running gears, powertrains, hulls, turrets and chassis, lubrication, heating-cooling, as well as in armour packages, Menatek Defense Technologies of Turkey is unveiling at Eurosatory the latest product dedicated to military vehicles, its EWS-M Military Type Weather Sensor. Accuracy depends very much on temperature, humidity and wind parameters, those data being provided to the fire control system using standard RS-485, Canbus and TCP-IP Ethernet serial connections; beside those, which are provided as standard, RS-422, Modbus and MilCAN are available as optional.

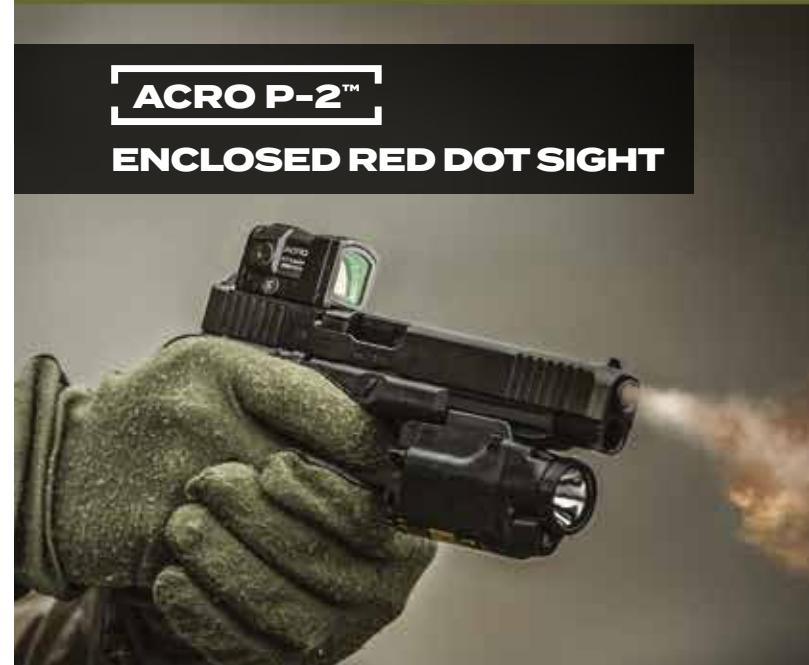
While temperature, humidity and atmospheric pressure do not vary quickly, this is not true for wind speed and direction. A built-in inertial measurement unit allows compensating sudden turret rotations, wind data being upgraded in less than one second. The sensor has a speed scale up to 40 m/s (over 140 km/h) with an accuracy of  $\pm 0.5\text{m/s}$ , while direction is measured on all  $360^\circ$ , with an accuracy of  $\pm 5.0^\circ$ . Temperature is measured in the  $-40/+70\text{ }^\circ\text{C}$  interval with an accuracy of  $1^\circ$ , relative humidity from 0 to 100% with a 5% accuracy, and atmospheric pressure in the 600-1,100 mbar range with a 2% accuracy.

An EWS-M-GPS model is available, fitted with a GPS receiver, which provides magnetic direction and geographic coordinates, the EWS-M-CW version fitted with sensor providing vectoral wind speed. The EWS-M is 500 mm high, EWS-M-GPS 522 mm, has a 75 mm diameter and weighs 3.5 kg. It is powered in DC at different voltages, 9-16 V or 18-32 V, and it has a low consumption, 30W at start and 10W in operation. ■



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# THE TEXELIS MR400 MOBILITY SOLUTION

By MARC CHASSILLAN

**T**exelis celebrates the recent delivery of the first SERVAL light multi-role armoured vehicles (VBMR) to the French ministry of the Armed Forces, as part of the SCORPION programme. The team Nexter-Texelis will deliver 70 vehicles by the end of 2022, out of 364 SERVALs ordered to date by the DGA.

Texelis presents its proven MR400 mobility solution for highly strategic and mobile military protected vehicles in the form of a scale model.

The MR400 comprises a full vehicle driveline, including axles, powerpack, suspension,

steering, cooling, exhaust and electrical systems. The MR400 delivers exceptional off-road mobility whilst simultaneously carrying high levels of protection and payload capacity.

Derived from the solution designed for the VBMR, the MR400 is a de-risked mobility solution for customers seeking high performance mobility for military 4x4 armoured vehicles. As part of the VBMR programme, the MR400 has undergone thousands of hours of test bed and on-road trials and is currently in production at Texelis' facility in Limoges, France, from where the com-



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pany will also deliver spares for the VBMR for the next 30 years. Texelis is also opened to localisation with potential customers in the frame of domestic programmes.

Texelis also introduces a new approach to wheeled ar-

moured vehicle electrification for military operators for a greener battlefield. Texelis' solution combines proven electric vehicle components with its advanced vehicle mobility engineering experience, to design and deliver hybrid electric vehicle architectures. ■

# DEPLOYNET; SAAB'S COMMUNICATIONS INFRASTRUCTURE FOR CRITICAL ENVIRONMENTS

By VALERIO DEL GRANDE



**B**eing connected has become part of everyone's life, and when the net is not available one's feels lost. This is even truer for organisations that have to carry out operations, be it military, police or disaster relief.

In the last case, one of the first things that is usually damaged is the communications grid, either because relays are physically destroyed, by an earthquake or a flood, or because everybody starts trying to communicate saturating the commercial grid, which is often used also by first responders.

Deploying a dedicated grid, capable to ensure 4K video, data and voice communications among a numerous community of users is the obvious solution, and this is what Saab has developed in its DeployNet.

The key elements are the electronic unit, the antenna that covers around 90° and is installed on a deployable mast, either single or multiple to cover the 360°, and a portable ruggedised computer for administrating the network. The system can be handled by two operators and deployed within 30 minutes. The system usually operates in Band 28 (700 MHz, LTE) or Band 43 (3.7 GHz, 5G), other bands being available on request. As usual the higher the frequency, the wider the bandwidth, the smaller the range, so more than a single system is needed to cover larger areas, the range in Band 28 and optimal conditions being 30-50 km. DeployNet can cover up to a 100 km<sup>2</sup> area and connect up to 6,500 simultaneous users.

Developed and produced by Saab Ltd. in Abu Dhabi, it has been launched earlier this year, is fully ready for production. ■

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# UN PETIT SUISSE : FLY-K MORTIER INDIVIDUEL POUR FORCES SPÉCIALES

Par JEAN MICHEL GUHL



L'année en cours a vu la fin des guerres désormais appelées pudiquement « opérations spéciales » même si leurs effets ressemblent en tous points à la guerre...

Le combat rapproché ou urbain est de nos jours une préoccupation majeure des armées où l'atout tactique de la technologie furtive du Fly-K Mk2 apporte un complément d'arme répondant précisément à ce type de combat. Ce dernier est devenu une com-

posante importante sur les champs de bataille actuels - ce que l'on peut observer dans le conflit en Ukraine où les forces en présence sont notamment dans des tranchées très proches de l'adversaire. Le combat rapproché et en zone urbaine très meurtrier par essence, démontre clairement l'importance de disposer d'une arme individuelle apte à pouvoir tirer des munitions en cloche, et notamment la nuit sous JVN des grenades éclairantes infrarouges dont l'adversaire ne peut localiser ni le tir ni la phase d'approche jusqu'à l'impact. C'est un avantage opérationnel essentiel et évite de se retrouver exposé au tir de l'ennemi.

Révélé en 2019 au salon Sofins des forces spéciales à Bordeaux, le lance-grenades léger Fly-K Mk2 représente la deuxième génération d'un système d'armes furtif destiné à l'appui-feu d'une section engagée en combat rapproché ou urbain. Éprouvé en opération et répondant aux exigences les plus récentes des missions de combat - déjà en service dans les forces émiriennes et françaises -, cet armement très novateur d'environ 5 kg, aisément transportable à l'épaule avec sa large bretelle, est capable de tirer jusqu'à douze coups à une cadence de tir très élevée sans jamais trahir sa position. Il ne fait pas de bruit, ne produit ni éclair ni fumée et la trajectoire de ses munitions n'est pas détectable au radar. Doté d'un nouveau garde-main, il ne produit aucune chaleur et dispose d'un indicateur de portée digital (DRI) lumineux très robuste avec boussole magnétique numérique intégrée. Son dispositif de visée réglable en fonction de la position du tireur permet de mettre en oeuvre un échantillonnage très large de munitions adaptées, y compris un choix de grenades grappins avec corde ou échelle tactique.

En version Fly-K Mk2, sa plaque de base ainsi que sa rotule ont été améliorées afin d'en optimiser l'assise et l'efficience. D'une mise en batterie très simple et sûre, il peut aussi être transporté chargé et prêt au tir immédiatement. Nouveautés dans le domaine tactique et opérationnel, la portée pour le combat rapproché passe de 650 m à 900 m et le système Fly-K Mk2 avancé dispose de la possibilité d'incorporer les drones comme capteur qui indiquent au tireur LGI la distance et la direction de l'objectif. Le drone assure donc ici la reconnaissance, l'identification, la surveillance et l'efficacité de l'impact du tir LGI. Au total, un système très complet. ■

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# CLEAR VISION FROM G&H

By GILES EBBUTT

Photonic technology company G&H specialises in precision optical systems and subsystems for a range of platforms across all domains and is focusing on its optical systems and capabilities at Eurosatory 22. These can be divided into two types: sighting systems for armoured fighting vehicles (AFV) from G&H's Kent brand product range, and lens systems for imaging across the infrared (IR) spectrum for night, low-light and in fog and haze from its StingRay brand range.

HALL  
5A  
STAND  
F 733

On display is the Kent Enhanced Driver's Vision System (EDVS), a self-contained driver's vision system. It has a fully customisable camera payload built into the unit itself which enables the driver to drive at night and hatch down, without the use of artificial illumination and at speeds comparable to those achievable in daylight. It has a binocular screen view with a two-camera payload, one day and one thermal imaging (TI), with long- or mid-wave IR (L/MWIR) options for the latter.

The EDVS is a modernisation upgrade of the existing Passive Driver's Periscope (PDP), maintaining an identical space envelope above armour with minimal changes below armour and utilising the same vehicle mounting interface and the same power specifications and connections.

G&H has recently been awarded a contract to supply the EDVS for a major main battle tank upgrade programme.

The StingRay FireAnt™ is a short-wave IR (SWIR) continuous zoom lens assembly solution designed with a constant aperture through the zoom range to avoid the loss of critical photons. Purpose built for performance in tactical situations, each lens in the series is designed for the harshest applications.

Developed in response to a market need for a CZ (continuous zoom) SWIR solution that would couple out-of-the-box integration capability with ruggedized performance, the FireAnt™ 40-400 mm SWIR is a reworking of an existing CZ SWIR solution and is suitable for use in multiple domains. It includes a fully configurable controller interface utilising multiple communication protocols.

G&H is also showcasing the StingRay NightCrawlIR™ MWIR, which is a series of motorised high definition MWIR lens systems which are ruggedized and fully configurable, and cover focal lengths from 16.5mm to 850mm. Applications include border surveillance and security and the lenses can be mounted on land vehicles or fixed wing and rotary wing aircraft.

Also on display is a gimbal model illustrating G&H's ability to design and manufacture customised fittings for a range of platforms. The model has been designed with an integrated 10x continuous ruggedized MWIR zoom lens assembly, such as might be used on a surveillance UAV or helicopter. The gimbal demonstrates the low size, weight and power (SWaP) integrated payload that is important for applications of this type. ■



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# LE VÉHICULE BLINDÉ DE MAINTIEN DE L'ORDRE DE SOFRAME

Par MARC CHASSILLAN

**A**près une compétition ouverte, la société alsacienne Soframe a remporté le programme de Véhicule Blindé Polyvalent (VBP) "Centaure" au profit des unités de Gendarmerie du ministère de l'Intérieur français. Dérivé de l'ARIVE, un véhicule produit à près de 2000 exemplaires, qui a fait de Soframe le premier constructeur de blindés français entre 2017 et 2019, le VBP sera produit à 90 exemplaires livrés entre 2022 et 2024,

date des Jeux Olympiques de Paris. Le VBP est un véhicule de sécurité destiné à contrer les menaces sur le théâtre national comme le terrorisme et les mouvements contestataires, politiques ou sociaux, qui dérivent vers des modes d'actions armés et violents. Il est conçu en tant que véritable système de systèmes alliant des moyens de recherche, d'investigation, de communication, de veille périphérique permanente et d'enregistrement



STAND  
EXTÉRIEUR  
PE6A-B430

couplés à des effecteurs qui permettent de proportionner la riposte jusqu'à des scénarios de type Vigipirate Ecarlate. Le véhicule permet également d'insérer organiquement les moyens de la Gendarmerie lors des engagements OPEX des forces françaises sans avoir recours à des matériels tiers. Avec ses

vastes volumes intérieurs, il permet des déploiements dans la durée, les unités de Gendarmerie conservant leur caractère opérationnel malgré un confinement parfois très long sous blindage. La plateforme ARIVE peut aussi se prêter à des instances plus spécifiquement militaires. ■



**MKU**, est une entreprise de défense et de sécurité indienne, qui dévoile une gamme de produits destinés à « donner du pouvoir aux héros ». Vaillante, elle démontre cette conviction en présentant un éventail de solutions balistiques susceptibles de faire la différence entre la vie et la mort pour les soldats et le personnel de sécurité.

Son système de gilet pare-balles Kavro, inspiré de situations réelles auxquelles le soldat moderne est confronté, est une combinaison balistique modulaire, configurable en fonction de la mission et dotée de plusieurs composants qui s'intègrent intelligem

## MKU PRÉSENTE UNE SOLUTION DE DÉFENSE BALISTIQUE À 360 DEGRÉS

Par JEAN-MICHEL GUHL

tement sur une base de gilet pare-balles sur mesure. Il permet aux soldats d'effectuer des missions en toute confiance et contribue à réduire la fatigue et à lui conserver son énergie, ce qui se traduit par un plus grand confort, une plus grande mobilité, une meilleure capacité de survie et une endurance accrue.

La conception modulaire et configurable en fonction des missions du nouveau système lui permet de s'adapter à des exigences opérationnelles spécifiques. Grâce à son usine de fabrication située à Sittensen, en Allemagne, l'entreprise est également partie prenante des préoccupations

européennes en matière de sécurité et de défense.

MKU compte des clients dans plus de 100 pays et a assuré la protection de plus de 3 millions de soldats et de 3 000 plates-formes, dans 230 forces, jusqu'à présent. Ses produits sont testés et certifiés par les plus grands laboratoires et agences du monde, notamment le National Institute of Justice (NIJ), aux États-Unis. Leurs installations sont certifiées AS-9100-2009 et ISO 9001-2008, en plus de la stricte certification BA 9000. Elles suivent les normes de qualité AQAP de l'OTAN et sont également enregistrées auprès de l'International Ae-

HALL  
6  
STAND  
K 112

ospace Quality Group (IAQG).

MKU prévoit également de lancer, à Eurosatory, son système d'intelligence logicielle Auto, qui pourrait bien constituer une sorte de saut quantique dans ce domaine. Alimentées par l'intelligence artificielle, l'informatique en temps réel, la télématique vidéo et les systèmes de surveillance intelligents, les solutions de contrôle intelligent de la flotte d'Auto ont été conçues pour permettre aux forces de répondre, de sécuriser, de suivre et de surveiller les missions dépendant des véhicules avec une efficacité maximale et un contrôle total. ■

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# SYSTÈME DEUX-EN-UN

Par JEAN-PIERRE HUSSON

HALL  
6  
STAND  
D 431

**C**ompact et léger (2,1 kg), le porte-plaque avec sac à dos amovible proposé par Defcon 5 (Italie) est réalisé en polyester 900 deniers, dont chaque couture est renforcée pour assurer une résistance maximale dans les moments de forte activité. Le système de rembourrage interne sur la poitrine, le dos et les épaules assure un maximum de confort et de respirabilité. La taille est réglable à hauteur d'épaule avec des bandes velcro et, à l'arrière, avec une sangle spéciale. La veste, qui permet l'insertion de plaques balistiques de protection dans les poches spéciales avant, arrière et la-

térales prévues à cet effet, est équipée d'un panneau souple amovible avec clip Duraflex et velcro, sur lequel sont fixées diverses poches tactiques. Le porte-plaque est livré avec un sac à dos amovible doté d'une poche principale, où un compartiment d'hydratation et une poche secondaire de plus petite capacité peuvent être rangés et fixés au moyen d'attaches spéciales. Une troisième poche avec fermeture auto-agrippante est cousue dessus. Toujours sur la partie supérieure, mais aussi sur les parties centrale et latérale, sont présents des trous protégés par une couche de matériau élastique permettant le passage



des tubes d'hydratation. Le sac à dos, qui est équipé de bretelles amovibles et de six bandes fixées verticalement à l'arrière pour l'ancrage sur le dos du porte-plaque, utilise le système MOLLE pour la fixation de poches tactiques

supplémentaires. L'ensemble porte-plaque/sac à dos peut être fourni en quatre couleurs : Italian Camo, Black, OD Green et Coyote TAN. ■

## CLP CLEANS ALL BORES

By MARC CHASSILLAN

The Täby based Swedish company CLP System AB has developed a unique, highly reliable and user friendly technology of bore cleaning systems for all kinds of guns from 25 to 203 mm. The Vibrating Pneumatic Bore Brush has been widely adopted by many NATO armies and navies as well as many forces in Asia and North America. The French Marine Nationale is the latest big user of VBPP for its 100 and 76 mm gun systems. Caesar, PZH-2000, M-109, Leopard-2, K9, Otomelara 76 mm and BAE 127 mm naval turrets, are among the most famous weapon systems which have adopted VPBB. The



system consists of a pneumatic powered control box, hoses, rammers, a set of brushes (metal, abrasive, nylon) and calibrated sleeves. A decoppering device spraying a special foam eliminates all traces and debris of copper in rifled bores. VPBB can be operated by a lonely operator and it takes 20 minutes to clean up a full bore of 155-52. VPBB is carried in a strong plastic case portable by two personnel and can be loaded in the trunk of a 4x4. VPBB is a key system in all bore life extension strategy. All CLP devices and consumables comply with green EU regulations and REACH directive. ■

# ADVANCED FUSES FROM KAMAN

HALL  
5A  
STAND  
B675

By GILES EBBUTT

**K**aman Fuzing, part of Kaman Corporation, is showcasing its Fire series of fuse products at Eurosatory 2022.

FireBurst is a height of burst (HoB) sensor for laser guided bombs. It engages multiple targets with a single weapon and can be used with any Paveway II general purpose bomb configuration, such as GBU-10, GBU-12, GBU-16, or GBU-58.

The fuse weighs less than 1.4kg and is self-powered using a thermal battery. HoB on/off is selectable from the cockpit, and the HoB can be selected

between 5 and 50 feet. The fuse has a fixed safe separation timer for aircraft safety and an impact angle of 35°-75°.

The FireAnt fuse system for ammunition, artillery, mortar and gravity dropped munitions uses a micro-electro-mechanical system (MEMS) as the safe & arm (S&A) assembly to interrupt the explosive train connecting the round's detonator to the lead charge.

The FireFly electronic safe and arm device (ESAD) is a small stepped cylinder, weighing less than 0.35 lbs. It can be readily



adapted to small UAS type munitions and does not contain microprocessors, software or programmable logic. It can be powered by a battery or the weapons system.

FireLight is in advanced development at TRL 7. It is a Li-DAR sensor tailored to custom implementation on small missiles, grenades and UAS to achieve precision Airburst

capability. It provides trigger input to a fuse based on stand-off, directional proximity, or HoB distance. Also at TRL 7 is the FireBug. This is an EMSAD that can be used on 40mm and larger munitions and artillery. Kaman has provided the Joint Programmable Fuse for the US Air Force since 2002 as well as to forty other nations. The JPF allows the settings of a weapon to be programmed in flight. ■



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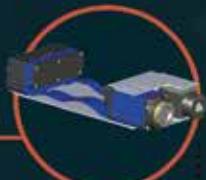
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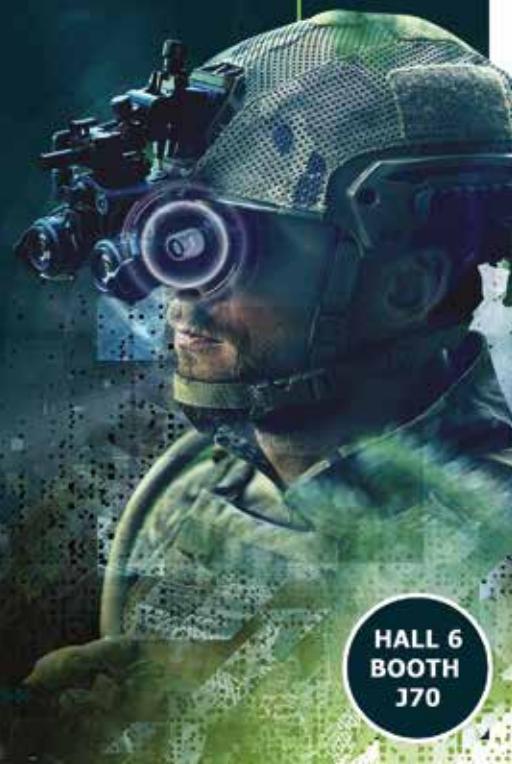
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**PHOTONIS**

AT THE HEART OF NIGHT VISION



HALL 6  
BOOTH  
370



# UNAC RIDER TO ENTER IN SERVICE

By MARC CHASSILLAN

HALL  
5A  
STAND  
H 90

**UNAC** delivered the first two Rider to the 35 Parachute Artillery Regiment in April. After a tough competition, UNAC was awarded a contract notified in 2017 by the DGA that includes the delivery of 300 Rider and 172 trailers. This new vehicle is intended for all the regiments of the 11 Parachute Brigade as well as the three components of the Special Forces (Marine nationale, armée de l'Air et de l'Espace and armée de Terre). Air-droppable, transportable by helicopter, and air-transportable, Rider is designed for rapid deployment operations. Electronics free, it is characterized by its rusticity and its great 4x4 crossing capacity. Rider is able to carry and tow more than its own curb weight. In the 11 parachute Brigade, Rider will carry weapon systems,



logistics, ammos and will tow the Thales 120 mm mortar. Two stretches can be laid on its flatbed. Thales and UNAC are cooperating on a high precision weapon system version with Thales 70 mm TELSON laser guided rockets. With a medium size between a quad and light conventional 4x4, Rider fills a niche for SF and airborne units special purpose vehicles. Rider can be seen at the French minister of defence pavilion. ■



**AeroGlow International Ltd will be highlighting its Hatch Lighting and Orientation (HaLO) System, an Emergency Egress Lighting System (EELS) at Eurosatory.**

The, Salisbury, UK-based company has spent two decades supplying the very best escape lighting available, and much longer than that getting to know and understand the complex field of soldier safety. HaLO is the

world's leading emergency escape lighting for armoured vehicles. It's a product that's proven to save lives, and it's in service on a multitude of platforms across the globe.

AeroGlow International has been contracted to deliver the latest HaLO Vehicle Egress Lighting System for British Army Boxer vehicles under the Mechanised Infantry Vehicle (MIV) programme. The contract is for

## LIGHTING TO SAFETY

By DAVID OLIVER

UK  
PAVILION  
BOOTH  
7676

the delivery of bespoke HaLO systems, with deliveries commencing in 2021 and running through to 2031.

Business Development Director Keith White commented "We are delighted that the latest version of HaLO featuring our Capacitor Pack power supply has been chosen for the Boxer platform. With the contract set to run for 10 years, this ensures the employment of

our staff and our suppliers' staff for the long term. AeroGlow International looks forward to providing the egress lighting systems, recognised as safety critical by both our customers and the end user. Having HaLO fitted to Boxer and other UK MOD core vehicle programmes will ensure the mitigation of drowning and egress risks for British military personnel for the foreseeable future". ■

# UN ÉTUI MODULAIRE ET CONFIGURABLE

Par JEAN-PIERRE HUSSON

HALL  
6  
STAND  
A 352



Projeté autour d'un élément central de base conçu pour accueillir un modèle spécifique de pistolet, l'étui Darwin de Radar Leather Division (Italie) se caractérise avant tout par la présence d'inserts modulaires interchangeables moulés par injection. Cette solution révolutionnaire offre à l'utilisateur la possibilité de porter son arme « nue », dépourvue de tout accessoire de visée, ou bien équipée d'une torche tactique ou d'un viseur, type à point rouge par exemple, ou même des deux à la fois, grâce aux différents inserts venant se positionner dans l'étui. Sécurisé contre l'extraction par une tierce personne, l'étui Darwin possède plusieurs dispositifs de sécurité et de rétention, dont un innovant système de verrouillage qui, par simple action du pouce, libère automatiquement les sécurités pour extraire l'arme. Outre celui-ci, appelé justement T-LEP (*Thumb released Lock for the Ejection Port*), l'étui est doté de sûretés Rotolock et Roto-Guard, combinées à un système passif de rétention STR avec vis réglable, qui agit sur la glissière de l'arme afin d'éviter tout mouvement inutile de celle-ci à l'intérieur de l'étui. Un système de port Multilink 2 permet d'associer à l'étui une large gamme d'accessoires, boucles de ceinturon, plaques de cuisse et système de largage rapide d'urgence. ■

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## ERGONOMIE ET FIABILITÉ

Par JEAN-PIERRE HUSSON

**B**asé sur la plate-forme bien connue du Galil-Ace, l'Ace Sniper d'Israel Weapon Industries (Israël) est un nouveau modèle semi-automatique pour

tireur d'élite chambré pour la munition standard OTAN de 7,62 x 51 mm, qui se caractérise par sa conception ergonomique et sa fiabilité à toute épreuve. Il permet à l'utilisateur de maîtriser des tirs précis à moyenne-longue distance, tandis que son fonctionnement semi-automatique favorise une acquisition multi-cible et un tir rapide vers

plusieurs objectifs successifs sans devoir abandonner pour autant la ligne de visée. L'arme est dotée d'une crosse pliable avec repose-joue réglable, d'un canon flottant,

martelé à froid, affichant une longueur de 23 pouces (584 mm), et d'un mécanisme de détente permettant de régler le poids de départ (deux options). Parmi les autres atouts de l'Ace Sniper, mentionnons un long rail Picatinny supérieur de 460 mm de long, avec système M-Lock à 3, 6 et 9 heures, permettant le montage d'accessoires d'aide au tir et à la visée, un bipied repliable et réglable et un chargeur Mil-Std d'une capacité de 20 coups. L'Ace Sniper, qui est conçu pour recevoir toutes les lunettes de visée et systèmes de vision diurne-nocturne disponibles aujourd'hui sur le marché, est destiné aussi bien à une utilisation militaire que de police. ■

## ISRAELI SMEs EXHIBIT THEIR PRODUCTS IN THE NATIONAL PAVILION

HALL  
6  
STAND  
D 568



As usual the Israeli Pavilion (Hall 6, D-568) hosts national SMEs, specialised in different domains that cover military and security issues. The 15 companies appear here in alphabetic order, with the most relevant products that they are exhibiting:

**BAT: Beit Alfa Technologies** presents non-lethal, accurate, effective, and user-friendly riot control vehicles.

**Condor Pacific Ltd** launches the LN-60, a low-cost inertial North Seeker/Land Navigator, and the NS-40, a low-cost tactical indexing North Seeker.

**CTI: Computech International** displays the Ground Control Station based on Panasonic FZ-G2, Ground Control Station based on Panasonic CF-33 MK2, Rugged Docking for APC based on CF-33 MK2, and more.

**Gate Technologies**, an innovative electronic safe & arm device (ESAD) company, present their technologies including innovative infantry-operated ESADs to cutting-edge low-volume missile & loitering ammunition ESADs for their first-ever international debut.

**Gilat Telecom** unveils personal tactical communication over satellites.

**Goldtec Technologies** unveil an optical signalling system for detecting blue forces at 3-12 micron wavelengths and SWIR.

**Hagor** displays the industry's advanced solutions including ballistic body armor, life-saving protective solutions, and advanced carrier systems currently used by the Israel Defense Forces and elite units.

**Magam Safety** unveils the

only self-sealing solutions in the world up to 30 mm that are compatible with any fuel-tank type.

**Magna BSP** launches Video Analytics software developed for mid-range surveillance systems, based on Stereoscopic Thermal Imaging cameras, AI, and Deep Learning for the first time.

**Physical Logic** unveils new generation of Closed Loop MEMS accelerometers (MAXL-CL-4000) for the first time and presents its two existing product lines: MAXL-OL-2000 Open Loop and MAXL-CL-3000 Closed Loop MEMS accelerometers.

**Redler Technologies** presents Electrical Power Distribution (EPD/PDU), SSCB (Solid State Circuit Breakers), and electrical servo motion control management solutions.

**Reshet Graf** presents customizable combat-ID solutions for NVG and thermal devices.

**Robotican** presents the Rooster, a hybrid drone-robot for indoor and underground tunnel scanning missions, and the Goshawk, an autonomous drone interceptor for C-UAS missions for the first time in Europe.

**Shladot** presents Integrated Riot Control Systems for mobile and stationary applications, in addition to armored vehicles, aircraft armoring, C4i centers, and various trailer and specialty vehicles.

**ThirdEye Systems** unveils a new version of the "Chimera" payload for the first time for UAVs and AI at the edge, with better performance and higher endurance than the "Chimera 6".

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# UNAC AND SAFRAN ARE DEVELOPING AN OPTIONALLY PILOTED LAND VEHICLE

**By MARC CHASSILLAN**

HALL  
6  
STAND  
F70

**W**ith a SWaP in between a quad and regular 4x4, the UNAC Rider seems ideally suited to carry out robotics missions on the battlefield. Safran Electronic & Defense will soon provide an automation package to the RIDER, a vehicle initially designed for reconnaissance and support missions in rapid deployment and special forces units. The first Rider vehicles have been delivered to the 11

French Airborne Brigade. The demonstration of this automation system was successfully shown before DGA and French armed forces representatives in May 2022. Backed by these promising results, UNAC and Safran Electronics & Defense, will start a new phase to turn the vehicle into an optionally manned platform. Safran solutions leverage from the innovative project FURIOUS won in 2017 aiming at delivering a robotic solution based on a UGV and a drone integrated in an infantry platoon. The Safran/UNAC robotic Rider will be part of the holistic assessment of robotics technologies made by the French army in the frame of the Vulcain project.. ■

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**CORDURA® NYCO FABRIC** Materials that offer the most thermal performance\* when exposed.

**7 BELT**  
**CORDURA® NYCO FABRIC** and welding. Long lasting and consistent fabric cushion.

**8 HELMET LINER**  
**CORDURA® NYCO FABRIC** Dual-layer with moisture-wicking performance.

**9 COMBAT PANTS**  
**CORDURA® NYCO FABRIC** Commodity durable and water-resistant.

**10 AXLE END**  
**CORDURA® CLASSIC FABRIC** and welding. Long lasting and consistent fabric cushion.

**11 KNEE**  
**CORDURA® CLASSIC FABRIC** CORDURA® NYCO FABRIC.

# PUSHING THE BOUNDARIES OF DURABLE FABRIC DEVELOPMENT: INVISTA'S CORDURA® NEXT GEN UNIFORMS FEATURED AT EUROSATORY THIS YEAR

By MURIELLE DELAPORTE

HALL  
5A  
STAND  
D 471

**INVISTA's CORDURA®** brand will showcase its most comprehensive military and tactical fabric portfolio to date at this year's Eurosatory. With a focus on durable, long-lasting uniform solutions, the brand will feature its CORDURA® NYCO Fabric technology.

Also on display will be a collection of head-to-toe mission critical mission performance fabrics, including CORDURA® Classic Fabric, CORDURA® Truelock™ Fabric, CORDURA® Combat Wool™, CORDURA® Naturalle™ Fabric, CORDURA® NYCO Knit, CORDURA® AFT Fabric, and the brand's latest innovation, the CORDURA® re/cor™ RN66. CORDURA® re/cor™ RN66 produces 83% fewer greenhouse gas emissions, consumes 82% less energy, and uses 57% less water. CORDURA® re/cor™ RN66 is entirely made from 100% pre-consumer fiber material that is 100% GRS (Global Recycled Standard) certified.

Innovation is at the core of what CORDURA® truly is. As CORDURA® is celebrating its 55<sup>th</sup> anniversary this year, its greatest legacy has continuously been in its innovation in military gear and apparel, from the beginning thanks to Nylon 6.6 fiber technologies. It has built its reputation on durability, reliability, and versatility, allowing soldiers to perform in all kinds of extreme climate and conditions from desert to jungle, to artic and cold weather. In addition, its products are widely recognized for there as well as on comfort and protection, owed thanks to innovative abrasion resistance and enhanced flame spread protection solutions.

**CORDURA®'s mission: "to help defend and protect the soldier of today and tomorrow." ■**



## THERMOTEKNIX AUGMENTS REALITY WITH ARTIM

By GILES EBBUTT

**T**he Thermoteknix is showcasing its new solution for night-time defence at Eurosatory 2022. The Augmented Reality Tactical Interface Module (ARTIM) brings together augmented reality (AR), thermal imaging and situational awareness capabilities in a single head-mounted display.

ARTIM is able to display AR in thermal or non-thermal mode, while also showing Blue Force Tracking and target information from a battle management system such as the Android Tactical Assault Kit (ATAK). The integration with ATAK is being demonstrated at Eurosatory. First released as a prototype in 2021, ARTIM is

now in production and this is the first public demonstration of the live system.

ARTIM provides heads-up navigation and tracking of own forces, using GPS and digital terrain elevation data (DTED) to deliver accurate visualisation of geospatial information. According to Thermoteknix the system can be integrated with "most digitalised soldier systems and secure communication networks". It can also be used as a stand-alone device with pre-loaded mission data such as routes, asset locations and other task related information.

Weighing 290g without batteries the ARTIM is mounted on the back of the helmet

and tracks the location and direction of view of the wearer. It receives and publishes networked position location information (PLI) data, and renders an AR overlay in the user's head mounted display (HMD).

The AR data is displayed via the Thermoteknix ClipIR XD, a thermal imaging clip-on device that converts existing monocular or binocular night vision devices by fusing thermal imaging and night vision technologies. Powered by the ARTIM battery pack it provides a 40° field of view, matching the full field of view of most night vision devices, and enables target detection at a range of up to 500m.

All ClipIR XD functions are controlled using its multifunction scroll wheel which can be mounted on either side of the night vision goggle and operated in all environments with or without gloves.

Thermoteknix has "a number of NATO customers" with "several thousand" ARTIMs due for delivery in the next 12 months. In June 2021 the company was awarded a contract worth GBP3.2 million by the UK Ministry of Defence for ClipIR XD systems, with the first consignment delivered in April 2022. Other customers include NATO militaries as well as military and law enforcement organisations in Europe, Asia and Africa. ■

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KJ 675



## TENEXIUM INTRODUCES NEW ARMOR SOLUTIONS

By MARC CHASSILLAN

HALL  
6  
STAND  
FE 433

**T**he Alsace based company Tenexium shows its latest developments and designs that meet the most extreme requirements and constraints in the field of vehicle armouring and personal protection. The range of products is based on an original composite that can be adapted to various requirements and for various appli-

cations (personal, vehicle and infrastructure protection). Tenexium is an innovative composite product whose cost/efficiency ratio allows to widely expand the spectrum of effective ballistic protection. Using an original composition of compressed high tenacity fabrics, Tenexium meets the most stringent requirements while offering an

affordable economic offer. Tenexium solutions can be seen on different vehicles. T-LINER is a spall liner for military and civilian armoured vehicles. It is integrated in police and law enforcement vehicles in addition to steel or ceramics-based armour solutions. T-WHEEL improves protection of armoured wheel arch against mines and IED

blast. T-KEEPER armoured carpet mitigates the consequences of a mine blast under the belly. T-KEEPER protects the new Gendarmerie Centaure armoured vehicle developed by the mother Soframe. T-SHIELD is an individual shield developed for police and internal security units. ■



# HELPED : FIRST-HAND DISASTER RELIEF XPERIENCE

By PAOLO VALPOLINI

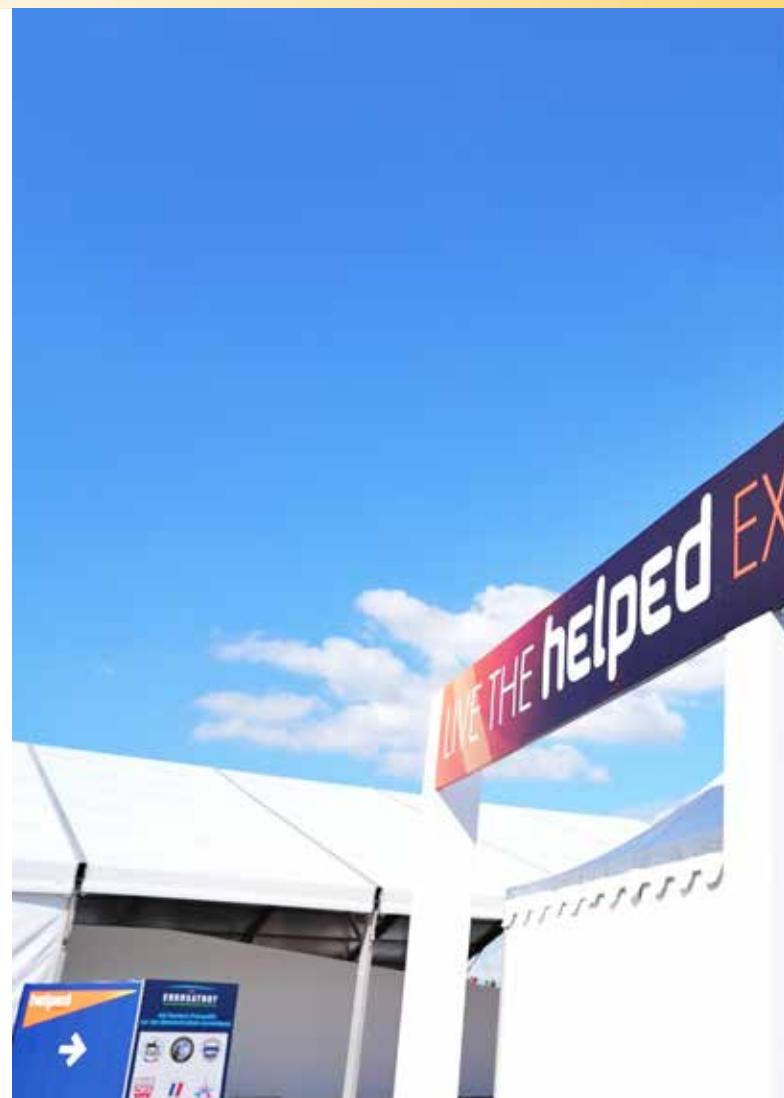
Born as a purely Defence exhibition, Eurosatory has evolved. Previous editions saw the addition of the Security sector, which with the increasing terrorist threats often becomes a grey area, where police forces and military units are both called to cooperate. The 2022 edition sees the addition of a third sector: beside the "green" and the "blue" we find now an "orange" sector, which hosts systems dedicated to first responders, natural or man-induced catastrophes being an area where rescue services are required to operate, but where very often security as well as military forces are also called to help. Both security and civil security assets can be called in the stabilisation and normalisation phases that follow a military confrontation. The aim is to become the "Swiss Knife", proposing systems able to solve any type of crisis in order to protect the human being.

COGES Events, the Eurosatory organiser, has adopted a new marketing approach, as many "green" systems and equipment find application also in the "orange" field: shelters, tents, power generators, communications,

command and control, UAVs, UGVs, to name only a few.

At Eurosatory 2022 visitors can find HELPED, the acronym for Humanitarian Emergency Logistic Project and Eco Development, a "demonstrator" where a number of dual-use systems are exhibited "in operation". COGES and GICAT took as a case study the events of October 2020 when a major storm known as "Alex" hit the Vésubie valley, in south-eastern France, destroying villages, cutting off communications and leaving behind 10 dead and eight missing people. HELPED is located beside the dynamic demonstration area and allows visitors to experience first-hand the feeling of being the victim of a disaster and of being assisted by rescuers.

Following a 2-3 minute briefing, visitors are injected into the chaotic, multi-crisis scenario, that follows a major disaster, where environmental threats can be complemented e.g. by bacteriological, chemical and security issues, the visitors group being processed as a group of refugees to be evacuated towards the HELPED facility. Here they are immersed in the HELPED



solution where systems and equipment provided by the companies participating in the HELPED scenario are demonstrated under real conditions.

All the systems and services of French manufacturers present at Eurosatory are then presented in a further tent, organised in various sectors: anticipating and preparing the mission, emergency care, projection and mobility, energy networks and control, shelter and rest, subsistence, care, human being care after life, security and safety, and finally reconstruction and normalisation. Here visitors who are interested in some of the equipment can find technical information as well as the booth number of the exhibitor within the Eurosatory premises, where they will be able to meet company personnel.

For the 2022 edition the organisers decided to test the HELPED concept, limiting it to French companies, over 80 of which are participating directly in the project. Should the concept succeed, in 2024 the demonstrator will be opened to all European and International companies, becoming a sort of "exhibition within the exhibition" according to COGES representatives. ■



# HELPED : EXPÉRIENCE DIRECTE DE SECOURS EN CAS DE CATASTROPHE

By PAOLO VALPOLINI

exposés plusieurs systèmes à double usage « en fonctionnement ». Le COGES et le GICAT ont pris comme étude de cas les événements d'octobre 2020, lorsqu'une tempête majeure connue sous le nom d'Alex a frappé la vallée de la Vésubie, dans le Sud-est de la France, détruisant des villages, coupant les communications et faisant dix morts et huit disparus. HELPED est situé à côté de la zone de démonstration dynamique et permet aux visiteurs une expérience d'immersion, comme s'ils étaient victimes d'une catastrophe et pris en charge par des sauveteurs.

Après un briefing de deux à trois minutes, les visiteurs sont plongés dans le scénario chaotique et multi-crise qui suit une catastrophe majeure, où les menaces environnementales peuvent être aggravées, par exemple, par des problèmes bactériologiques, chimiques et de sécurité, les visiteurs étant traités comme un groupe de réfugiés à évacuer vers l'installation HELPED. Là, ils sont immergés dans la solution HELPED, où la démonstration des systèmes et équipements fournis par les entreprises participant au scénario HELPED

**N**ée comme un salon 100 % Défense, Eurosatory a évolué. Les éditions précédentes ont vu l'ajout du secteur de la sécurité, qui, avec l'augmentation des menaces terroristes, devient souvent une zone grise, où les forces de police et les unités militaires sont toutes deux appelées à coopérer. L'édition 2022 s'enrichit d'un troisième secteur : à côté du « vert » et du « bleu », on trouve désormais un secteur « orange », qui héberge des systèmes dédiés aux intervenants d'urgence, les catastrophes naturelles ou provoquées par l'homme étant un domaine où les services de secours sont tenus d'opérer, mais où très souvent les forces de sécurité et militaires sont également appelées à l'aide. Les moyens de sécurité mais aussi de sécurité civile peuvent être appellés

dans les phases de stabilisation et de normalisation qui suivent une confrontation militaire. L'objectif est de devenir le « couteau suisse », en proposant des systèmes capables de résoudre tout type de crise afin de protéger l'être humain.

COGES Events, l'organisateur d'Eurosatory, a adopté une nouvelle approche marketing, car de nombreux systèmes et équipements « verts » trouvent également leur application dans le domaine « orange » : abris, tentes, groupes électrogènes, communications, commande et contrôle, drones, UGV, pour n'en citer que quelques-uns.

À Eurosatory 2022, les visiteurs pourront retrouver HELPED, acronyme de *Humanity Emergency Logistic Project and Eco Development*, un « démonstrateur » où sont

se fait dans des conditions réelles.

Tous les systèmes et services des industriels français présents à Eurosatory sont ensuite présentés sous une autre tente, organisée en différents secteurs : anticipation et préparation de la mission, soins d'urgence, projection et mobilité, réseaux et contrôle d'énergie, abri et repos, alimentation, soins des victimes, gestion des morts, sécurité et sûreté, et enfin reconstruction et normalisation. Les visiteurs intéressés par ces équipements pourront trouver des informations techniques ainsi que le numéro de stand de l'exposant dans l'enceinte d'Eurosatory, où ils pourront rencontrer le personnel de l'entreprise.

Pour l'édition 2022, les organisateurs ont décidé de tester le concept HELPED en le limitant aux entreprises françaises, dont plus de 80 participent directement au projet. Si le concept rencontre le succès, le démonstrateur sera ouvert en 2024 à toutes les entreprises européennes et internationales, devenant une sorte « d'exposition dans l'exposition », selon les représentants du COGES. ■



# MICHIGAN'S RESOURCES OFFER POTENTIAL TO POWER THE DEFENSE INDUSTRY

**Located in the Great Lakes region of the United States and home to Detroit, the birthplace of the automotive industry, Michigan's innovative culture and pipeline of engineering talents have driven the defense, aerospace, robotics, and cyber sectors to become the nexus of autonomy and artificial intelligence. The state shares a history of breaking new ground, where a century ago it pioneered transportation. Since then, it has remained at the forefront of actively developing a greater and safer future.**

Through the Michigan Defense Center, it has dedicated its efforts to supporting, protecting, and growing the Michigan's defense and homeland security missions, as well as Michigan businesses that uphold our the country's security and military's safety. With the defense industry contributing \$30 billion annually in economic activity to the state economy, the Michigan Defense Center successfully advocates for its 4,000 suppliers, 1,000 prime contractors, and 9 U.S. Army command centers.

Michigan is also where the largest U.S. National Guard

training facility in the country is located, providing opportunities and strategic advantages for companies in the defense industry and beyond to test and troubleshoot their different products. The Michigan National Guard has remained laser-focused on increasing its training capabilities and innovation efforts, establishing a living laboratory where new ideas and technologies are born, trialed, and evaluated for the future.

Through advanced manufacturing, technology, and R&D, Michigan is effectively paving the way for future genera-

tions of military autonomous land, air and marine platforms. With assets such as the Michigan Department of Transportation's connected corridor, Mcity and Willow Run - test environments for driverless personal and military vehicles - Michigan is at the forefront of tomorrow's transportation.

As the battlefield continues to expand across all domains - land, air, sea, space, and cyber - Michigan is distinctively positioned to lead.

To learn more about Michigan's robust defense industry and opportunities, go to [michigandefensecenter.com](http://michigandefensecenter.com). ■

Connect with Team Michigan at **Booth B522** in the U.S. Pavilion

## FRESTEMS LAUNCHES REVOLUTIONARY MILITARY MAIN STRETCHER AT EUROSATORY

By ELISABETH GOSELIN-MALO

Frestems, the leading manufacturer of military ambulance solutions, launched at this year's edition of Eurosatory its latest, revolutionary military main stretcher, the HELPED. During the launch, visitors are immersed in a simulated chaotic, multi-crisis scenario following a major disaster, where a number of environmental threats such as bacteriological and chemical issues arise. The group proceeds to then be treated as refugees requiring evacuation to the HELPED fa-

cility. There, they are exposed first-hand to HELPED solution where the systems and equipment provided by the different participating companies in the scenario are demonstrated under real-life conditions.

In the context of the 2022 edition of the conference, Frestems organized have decided to test the HELPED concept by solely limiting the participation to French industries, of which over 80 are directly involved in the project. Should

HALL 6  
BOOTH  
H 300



the concept succeed, Frestems foresees in 2024 to open it to all European and international firms to allow HELPED to become an exhibition within an exhibition.

All technologies and services of French manufacturers present at the defence conference are then shown under another tent, organize into 8 different sectors: anticipation and preparation of the mission, emergency care, projection and mobility, energy networks and control,

shelter and rest, subsistence, care, care of the human being after life, security and safety, and finally reconstruction and normalization. Visitors interested in specific equipment or systems are able to find greater technical information and details there as well as the exhibitor's stand number within the Eurosatory grounds, where they will further be able to meet the company's staff for additional inquiries. ■



# AVON PROTECTION UNVEILS EXOSKIN CBRN PROTECTION RANGE

By DAVID OLIVER

HALL  
5A  
STAND  
D-767

Avon Protection has developed a new range of products to protect military personnel operating in chemical, biological, radiological and nuclear (CBRN) environments; the EXOSKIN-B1 High Traction CBRN Boots and EXOSKIN-G1 Tactile CBRN Gloves.

The CBRN threat is a growing concern for military forces, with the use of chemical weapons rising among both state actors and terrorist groups. In response, Avon Protection developed the EXOSKIN range of boots and gloves to supplement its CBRN respiratory protection products to protect personnel without compromising the wearer's tactical agility in the field.

Designed to allow for the handling and operation of electronic touch screen devices, the EXOSKIN-G1 glove offers a critical operational advantage. The ambidextrous glove features a rubberised outer layer textured to maintain grip in wet conditions, with an intelligent, seamless inner knitted liner that has a conductive tip

on both the thumb and forefinger. Together these layers optimise the wearer's dexterity and allow them to complete their mission safely.

The EXOSKIN-B1 boot provides improved durability and agility in the field, with quick-release straps to secure the garment over standard footwear. A highly textured sole improves the wearer's manoeuvrability in all underfoot conditions. In addition, it is 100 percent leak tested.

Manufactured from Avon Protection's proven rubber technology, both the EXOSKIN-G1 glove and EXOSKIN-B1 boot offer Chemical Warfare Agent and Toxic Industrial Chemical protection and are impermeable to biological agents.

Designed for quick donning and doffing, they integrate with many protective suit ensembles including JSLIST and MkIVA.

"Since the end of the Cold War, many nations have become more aware of the CBRN threats faced on the modern battlefield as we continue to see nerve agents and chemical weapons deployed in the field," said Steve Elwell, Vice President Europe, Middle East, Africa and Asia for Avon Protection. "Personnel must be able to operate safely on a contaminated battlefield without relying on cumbersome protection measures."

"In developing the EXOSKIN range of CBRN protective garments, our focus was to optimise end-user versatility in the most demanding environments,

while continuing our relentless pursuit to keep operators safe from these chemical and biological threats."

With more than 100 years of experience delivering innovatively designed and engineered CBRN solutions, the EXOSKIN range leverages Avon Protection's material science capability and deep knowledge of protective CBRN technology.

The EXOSKIN range will be on display at Eurosatory along with Avon Protection's full range of personnel protective equipment, including full-face respirators, escape hoods, SCBA systems, modular PAPR units, underwater equipment and ballistic helmets.

Avon Protection is exhibiting at Eurosatory 2022. ■

## LE CLUSTER EDEN : PLUS FORTS ENSEMBLE

Par LAETITIA BLANDIN

**Depuis sa création en 2008, le Cluster EDEN (European Defense Economic Network) n'a jamais raté une édition du salon Eurosatory. Un rendez-vous incontournable pour ce groupement réunissant plus d'une centaine d'industriels spécialisés en défense et sécurité, des entreprises initialement de la région Auvergne-Rhône-Alpes, puis maintenant de Bretagne, Provence-Alpes-Côte d'Azur, Ile-de-France et du territoire de Belfort. La diversité des savoir-faire des membres du Cluster et leur fort potentiel**

**en innovation leur permettent d'être des partenaires et fournisseurs du ministère des Armées et de la majorité des grands groupes français ou européens.**

Eurosatory sera notamment l'occasion de découvrir de nombreuses nouveautés dans les domaines de la robotique et des drones, des big data et de l'intelligence artificielle, des armes à léthalité réduite ou encore de la protection NRBC. Tournés vers l'exportation et les partenariats à l'international, les industriels s'appuient à la fois sur leurs

savoir-faire et technologies, et sur le Cluster EDEN dont le réseau institutionnel, académique et industriel en France et dans le monde permet des mises en relations sécurisées et pérennes. La présence du Cluster sur d'autres salons de défense et de sécurité internationaux est d'ailleurs un signe de la réussite de ce type de groupement, qui s'appuie sur la complémentarité technologique de ses membres et sa capacité à promouvoir leur savoir-faire, individuellement ou en équipe, selon les marchés et les besoins en matière

de défense et de sécurité de ministères, d'industriels, de laboratoires, etc.

Cette année, 53 membres seront exposants sur Eurosatory dont 49 sur le pavillon de plus de 600 m<sup>2</sup> du Cluster EDEN qui proposera, entre autres, des animations en réalité virtuelle pour présenter plusieurs savoir-faire. Le Cluster EDEN sera également présent par le biais de ses adhérents aux conférences du salon ou sur le ESY Lab.

**Un cocktail est organisé sur le pavillon le jour de l'ouverture à 17 h. ■**



## KEY EVENTS OF THE DAY 1

DO NOT MISS THESE IMPORTANT EVENTS OF THE DAY

**10:30AM**

### "EUROSATORY START-UP COMPETITION" AWARD

Discover the winner of the start-up innovation competition! In partnership with Agorize



### CONFÉRENCES

Join international land and airland Defence & Security domain players in their reflection on the current and future challenges of the sector. The conference programme is available on the Eurosatory website or at the exhibition's official Web App



TIME	BALARD HALL 5A	ÉLYSÉE HALL 5B	BEAUVAU HALL 5B	ORSAY HALL 6	AGORA INNOVATION HALL 5A	EXHIBITOR PITCH CORNER HALL 6
12:30PM – 1:00PM	<b>Simulation</b> Place and role of modeling and simulation into future commitments preparation ? "Overview of the Army's operational simulation" <b>AFSIM</b>				<b>12:00PM – 12:30PM</b> <b>Awards ceremony</b> <b>AGORIZÉ</b> Disruptive dual innovation for military and security forces	<b>2:00 – GRADEL</b> Robotic Heavy Duty Sustainable Lightweight 3D-Structures with GRAM
2:00PM – 3:00PM	<b>Foresight – French Army Staff</b> Titan: the elaboration of the future air-land force system	<b>Cyber</b> European digital sovereignty: a state of emergency <b>HEXATRUST</b>			<b>2:30PM – 3:00PM</b> <b>INAUGURAL KEYNOTE</b> Emmanuel Chiva, Director of the Defense Innovation Agency	<b>2:30PM – BLACKNED</b> TacticalCore by BLACKNED: A key enabler for digitization of armed forces at the tactical edge
3:00PM – 4:00PM	<b>RETEX – French Army Staff</b> The GRIFFON vehicle in Saharan Strip		<b>Public Safety</b> European funding for Civil Security <b>PCN CLUSTER 3</b>		<b>3:15PM – 5:00PM</b> <b>START-UP PITCHES</b>	<b>3:00PM – MODEST TREE</b> Leveraging Data and Digital Twins in Field Service
4:00PM – 5:00PM	<b>RETEX – French Army Staff</b> Operational information and communication systems (SIOC)					<b>3:30PM – ATHONET</b> 4G/5G Tactical Networks for forces
	<b>Foresight – French Army Staff</b> Long range fires and action in the depth: what vision for the future?					<b>4:00PM – HUBER+SUHNER</b> Turnkey electrical and optical connectivity solutions for ground, sea and air
						<b>4:30PM – NEGER</b> RF Spectrum Intelligence anti-drone countermeasures, jamming and anti-jamming in dense urban areas

### LES DEMONSTRATIONS DYNAMIQUES

9:45am-10:30am	EUROSATORY Live Demonstration
2:30pm-3:00pm	CRS* Live Demonstration NEW IN 2022
4:00am-4:45pm	EUROSATORY Live Demonstration
Industries of EUROSATORY Live Demonstration	ARQUUS, FN HERSTAL, ICARUS SWARMS, INTERNATIONAL ARMORED GROUP, TSD International, MILREM, SIDES, TECHNAMM

### HELPED - NEW IN 2022

Live an immersive experience of multifaceted crisis management.  
Visit the outdoor live demonstrations area.

**helped**  
by COGESEVENTS

Eurosatory 2022 will be open:  
Monday June 13 to Thursday June 16 from 9 am to 5 pm  
Friday June 17 from 9 am to 4 pm

SEE YOU TOMORROW FOR THE 2<sup>ND</sup> DAY OF THE EXHIBITION!

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The Bronco family of All Terrain Tracked Carriers offer superior mobility, support high payloads and can be configured to suit a range of roles from logistics to fire support. Battle-proven and able to traverse over 80% of the world's terrain under adverse conditions, this is the one platform that goes where others fear to tread.

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Mortar Variant



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 **ST Engineering**

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# AKERON

## A UNIQUE FAMILY OF FIFTH-GENERATION TACTICAL COMBAT MISSILES



To meet current and future operational needs, both for dismounted combat and from land, aeronautical or even naval platforms, MBDA has developed AKERON, a unique family of fifth-generation tactical combat missiles, which includes the MMP and MHT missiles, renamed AKERON MP and AKERON LP respectively.

AKERON missiles incorporate the latest technologies in terms of high-resolution multi-band imagers, multi-effect warheads (anti-tank, anti-infrastructure, anti-personnel), data links and multi-mode guidance algorithms based on AI techniques. All ensuring robust and precise guidance at any distance, in all conditions. With AKERON, MBDA is offering a family of missiles that can be adapted as closely as possible to the needs of collaborative tactical combat.



SECURING  
THE SKIES



PROTECTING  
YOUR ASSETS



MASTERING  
THE SEAS



COMMANDING  
THE COMBAT ZONE

