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2018 EUROSATORY DAILY

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EU tank breaks cover

After being kept under wraps, the French-German KNDS Group (Krauss-Maffei Wegmann + Nexter Defense Systems) has unveiled its first joint project, the EMBT, or European Main Battle Tank. Essentially a technology demonstrator, with further development, "the EMBT is a short-term response to the operational need of the market for high-intensity battle tanks".

The EMBT consists of the KMW Leopard 2A7 MBT platform fitted with the Nexter Leclerc MBT turret. The two elements were integrated at Nexter's facility at Roanne, where Leclerc production was originally undertaken. Since then, the EMBT has undertaken

mobility and firing trials, the latter performed in Portugal, with 22 rounds fired from the 120mm smoothbore gun.

The standard Leopard 2A7 has a three-person turret armed with a manually loaded 120mm smoothbore gun, whereas the Leclerc turret is fitted with a 120mm smoothbore gun fed by a bustle-mounted automatic loader. The Leclerc turret is lighter and more compact, which reduces the combined weight by six tonnes.

According to KNDS, the EMBT demonstrates that their combined skills make it the legitimate and essential industrial actor of the two key French-German future programmes.

The first of these is the follow-on to the Leopard 2/Leclerc MBT, which is called the Main Ground Combat System and has a potential in-service date of around 2035. This could well be brought forward because the design of these two MBTs is now many years old and the point will be reached where they can no longer be upgraded.

The second programme is the future artillery system. Called the Common Indirect Fire System, this has a number of elements, including the replacement of the German Army 155mm PzH2000 tracked and French 155mm CAESAR wheeled self-propelled artillery systems.



Cerberus, véhicule 6x4
anti-émeutes

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New projectiles for Spanish
Army will fire further

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Radio logicielle tactique
TRICS

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MODULARITY - COMMONALITY - READINESS

STAND B267 HALL 5A

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Trophée Export Sécurité du GICAT

PAR BRIGITTE XERRI

A chaque édition d'Eurosatory, le GICAT (Groupement français des industries de Défense et de Sécurité terrestres et aéroterrestres) remet ce trophée à une société française de la Défense et de la Sécurité terrestres et aéroterrestres exposant au Salon pour son action particulièrement performante à l'export. Hier, il a été remis à la société Sides, PME qui produit des composants et des véhicules pour la lutte anti-incendie ainsi que les services associés.

► La cabine du Cerberus dispose d'un système de surpression empêchant l'entrée de gaz à l'intérieur de l'habitacle

Efficace pour maintenir l'ordre

PAR JACQUES DE LESTAPIS

Le Cerberus de Armor Holding (France) est un véhicule anti-émeute. Il a été conçu par les filiales du groupe, Sides - tournée vers les systèmes hydrauliques de lutte contre les incendies et fabricant de ses propres composants - et Essonne Sécurité - intégrateurs de solutions balistiques -, pour le militaire et le civil. C'est là un véhicule complet qui intègre un

nombre élevé de moyens d'actions et une protection complète des cinq membres d'équipage. Les performances de son châssis (6x4, 6 cylindres 320 ch, pour un PTAC de 24 tonnes) sont adaptées aux transformations faites par Sides et Essonne Sécurité. Equipé de pompes à eau haute pression avec trois canons à pression réglable, de réservoirs de liquide lacrymogène, de colorant, d'un extincteur à

incendie, il incorpore également des équipements de surveillance. Ainsi, quatre caméras haute définition et autant de moniteurs 17" permettent aux opérateurs d'avoir une vue d'ensemble à 360° autour du véhicule. Chaque canon à eau dispose d'une caméra supplémentaire doublée d'un télémètre laser. Celui-ci calcule la distance du point d'impact afin de régler la puissance du jet en fonction de la menace.



Pour fournir une protection maximale à l'équipage, Essonne Sécurité a entièrement blindé ce véhicule. Il résiste à des attaques répétées, d'éclats ou d'explosions de cocktails divers. (Stand 5bD150)

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Hall 6 Stand B-51

Otokar

EN BREF

■ Ces quatre prochaines années, **ISIS Analytics** (France) et **Identa** (Israël) fourniront à la **Police** et **Gendarmerie nationales**, ainsi qu'aux **Douanes** françaises 480 000 dispositifs mono-drogue de détection et d'identification de produits stupéfiants (opiacés, cocaïne et dérivés, THC, amphétamines, méthamphétamines, voire LSD et GHB), et 200 000 kits multi-drogues (2,1 M€). **(Stand 5bD10)**

■ L'équipe nationale sportive militaire norvégienne utilise pas moins de dix munitions différentes, dont des calibres .22, .32 S&W long, 6,5x55 mm, 6 mm BR Normo et 6XC.

■ La Norvège étudie la location de deux mini ROV (Remote Operated Vehicle) au profit de ses garde-côtes.

■ Treize millions cinq cents milles Euros, tel est le montant des objets promotionnels standards acquis par le **ministère** français des **Armées** auprès de **Création GLF**, **Cecop**, **Full Ace**, **Gemaco France**, **Birdy Communication**, **Studio C** et **Goodicom** (France).

(Stand 5aF20-178-268)

■ Les Tracker de la **Sécurité civile** française vont être progressivement retirés du service et remplacés par quelque six avions MRBET (Multi-Rôles Bombardier d'Eau et Transport) bi-turbopropulseurs. La capacité sur zone des nouveaux appareils sera de 2,5 heures, au moins, pour les missions GAAR (Guet Aérien Armé). Un marché de 308 M€ assuré par **Conair** (France). **(Stand 5bD10)**

■ **Saltech** (Suisse) et **Rheinmetall** (Allemagne) doivent livrer des grenades à la Police néerlandaise (5 M€). **(Stand 6H198/PE6bC240)**

Engin simple pour forces spéciales

PAR JACQUES DE LESTAPIS

Pour la DGA, Unac (France) entreprend la production d'un programme de 300 fardiers 4x4 tout-terrain militaires légers, aérotransportables, aérolarigables et héliportables, destinés aux forces spéciales et à celles de la 11^{ème} brigade parachutiste française. Livrables dès la fin 2021, ils pèsent à vide 1 000 kg, offrent une charge utile de 900 kg et leur motorisation est de 35 ch. Quelque 200 remorques de 200 kg offrant une charge utile de 350 kg les complètent avec les éléments de soutien et le MCO (36 M€). **(Stand 5aF20-178-268/Pe6aB451)**



▲ Le fardier est un véhicule simple et robuste sans aucune gestion électronique

"Team on Mission" pour l'Intérieur

PAR FRÉDÉRIC LERT

Streamwide (France) a été fondée en 2001 avec l'idée de fournir aux opérateurs télécom les moyens de profiter de la révolution numérique. Dans le sillage des opérateurs commerciaux, le monde de la Défense et de la Sécurité se convertit également au protocole 4G/LTE. Et, c'est pour avoir correctement anticipé ce mouvement que Streamwide a été sélectionnée par le ministère français de l'Intérieur pour fournir sa solution "Team on Mission" dans le cadre de l'appel d'offres PCSTORM. "Team on Mission" propose une nouvelle généra-

tion de communication "Push-to-Talk" sur les réseaux 4G/LTE, incluant des services d'appels voix et vidéo chiffrés, des échanges sécurisés de données et de localisation en temps réel. Les unités équipées de ce système seront en mesure de coordonner toutes leurs actions, simplement en utilisant des smartphones combinant une interface conviviale et un niveau élevé de sécurité et de chiffrement. Le contrat, qui vient d'être notifié, débouchera sur un déploiement des applications auprès d'environ 20 000 utilisateurs avant la fin de l'année.

(Stand 5bF261)



▲ L'application "Team on Mission" combine la souplesse d'emploi du smartphone à l'exigence de rapidité et de confidentialité des services de sécurité

Une mini radio logicielle très tactique

PAR JEAN-MICHEL GUHL

Savox Communications (Finlande) expose un mannequin équipé de sa nouvelle radio logicielle TRICS, tactique multiplex et multifonction, portable sur l'épaule ou sur gilet. Ses capacités d'adaptation à des missions de types très variés sont nombreuses. On peut même l'utiliser avec des gants, les touches en caoutchouc étant très larges. Déjà sélectionné au printemps dernier par un client européen (non dévoilé) pour ses forces de police nationale, ce système radio compact personnalisable se présente comme un boîtier anti-choc. Il est muni d'une connec-

tique ultra simple d'emploi — mais, toutefois, très élaborée — autorisant l'usage de 4 canaux en clair, ou d'autant de fonctions diverses réparties entre liaisons radio, téléphonie mobile, intercom et bande 4G/LTE avec fonction amplification de la voix. Les connecteurs situés dans le boîtier sont protégés contre l'eau et la neige et permettent l'utilisation conjointe d'une tablette. L'ensemble reste très léger et robuste.

(Stand 6K301)



▲ On note sur le cœur du mannequin l'ensemble radio TRICS compact de la société finlandaise Savox

De nouveaux venus

PAR JEAN-PIERRE HUSSON

Le Masada et le Tavor 7 sont deux nouvelles armes individuelles venues s'ajouter au catalogue de IWI – Israel Weapon Industries. Pistolet à carcasse en polymère, chamberé pour la 9x19 mm Otan, le Masada est un modèle à percuteur lancé, avec détente articulée et sûreté intégrée. Il est doté d'un canon de 104 mm, à axe bas pour réduire le recul et permettre des tirs plus rapides et précis. Totalement ambidextre, il est alimenté par chargeur de 17 coups et muni de rail pour le montage d'un accessoire d'aide au tir. Conçu pour résister aux conditions d'utilisation les plus sévères, il mesure 189 mm de long et son poids est de 650 g. Egalement constitué d'une carcasse en polymère, le Tavor 7 est un Bullpup chamberé



► Le Tavor 7 avec des viseurs de Miprolight

en 7,62x51 mm Otan, disponible avec canon de 432 ou 508 mm. Fonctionnant par emprunt de gaz, avec système à piston à course brève, il dispose de commandes ambidextres, d'une fenêtre d'éjection et d'un levier d'armement

réversibles, d'un rail Picatinny, et d'un garde-main M-Lock pour le montage d'accessoires. Alimenté par chargeur de 20 coups, il mesure 723 mm de long pour un poids de 4,1 kg, en version à canon de 432 mm.

(Stand 6D647)

EN BREF

■ La **Guardia Civil** espagnole a commandé auprès de **Beretta Benelli Iberica** (Espagne) des munitions de 9x19 mm No Tox. (Stand 6E360)

■ En France, la crainte des incendies de grande envergure inquiète les départements. Ainsi, les **SDIS** (Service Départemental d'Incendie et de Secours) du Gard et de l'Hérault recherchent des moyens aériens pour lutter contre les feux de végétation.

■ L'aérostat de type SkyStar 180 de **RT LTA** (Israël) est en service opérationnel dans l'**armée française**. Système tactique mobile moyenne portée de surveillance, ce ballon gonflé à l'hélium est relié à une station sol. Il peut emporter une charge de 20 kg, tel un système de surveillance électro-optique jour et nuit stabilisée. Le vol s'effectue à 1 000 pieds d'altitude pendant 72 heures et par des vents pouvant atteindre 40 nœuds.

(Stands 6E751/5aF20-178-268)

■ Un drone Raven RQ-11B **AeroVironment** (Etats-Unis) va être livré aux Carabinieri italiens.

■ Le **MoD** britannique a commandé plus de quatorze UAS (Unmanned Air Systems) captifs auprès de **Marlborough Communications** (Royaume-Uni). D'une position géographique élevée, ils permettent de surveiller et d'observer sur 360° toute une zone tactique donnée. Leur autonomie Stand-Off est supérieure à 12 heures.

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Gunning for the drone

BY SAM J BASCH

Australia-based counter-drone technology provider DroneShield (Hall 6, Stand K517) has just announced a major order for its DroneGun Tactical by the MoD of a "major Middle East country allied with Western governments".

Given that the drone mitigation industry is only a few years old, this is a significant achievement on the part of the company. DroneShield said the

\$3.2 million deal for 70 units is arguably the largest of its kind in the industry to date anywhere. The company expects follow-on orders, thus cementing its leadership in the industry.

DroneShield secured the order through Zariba Security, an Ottawa-based distributor founded by British and Canadian "security and intelligence professionals".

Drone detection and drone

mitigation remain embryonic industries that have developed very recently on the back of a growing use of drones, often by extremists with nefarious aims in mind.

While this order is still subject to approval by US regulators, DroneShield expects it to go through. As the company's chief executive Oleg Vornic commented: "This is a game-changer for DroneShield."



French President Emmanuel Macron inspecting the DroneGun Tactical during a recent visit to French Army Camp Mourmelon

Hornet has venomous sting



Yugoimport reports that its Strsljen (Hornet) X-01 rotary-wing unmanned air vehicle began flight trials last week. The air vehicle has been developed to undertake both reconnaissance and attack missions, and is equipped with outrigger pylons and an underbelly hardpoint for external stores.

On show at Eurosatory (Hall 6, Stand B571) is a full-scale mock-up of the Strsljen armed with 12 small-diameter bombs that are currently under development.

The GPS-guided winged bombs have a glide range of 4km when launched from the Strsljen's ceiling of 4,000m, attacking their targets in a near-vertical dive.

Powered by a Serbia-built Phoenix-180 turboshaft engine, the Strsljen has a maximum take-off weight of 750kg, of which 350kg can be payload. A typical combination would be 200 litres of fuel with 200kg of armament, giving an endurance of 3.5 hours. This can be four hours when a full fuel load of 240 litres is carried. Much of the structure – and the main and tail rotor blades – is constructed from composites.

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Precision targeting

Turkish defence electronics specialist Aselsan (Hall 6, Stand B200) is showing some of its solutions for precision targeting from tactical aircraft. An important system is the Aselpod advanced targeting pod, which has been acquired by the Turkish air force for carriage by F-4-2020 upgraded Phantom and F-16 aircraft, and has reportedly been ordered by Pakistan for fitment to the JF-17 Thunder.

To complement the Aselpod, the company has also developed a range of precision-guided munitions. A laser-guided bomb seeker adds a semi-active laser seeker to the nose of a Turkish-made Mk 80 series bomb, with a Paveway II-style fin kit.

With Tubitak-SAGE – Turkey's defence industry R&D establishment – Aselsan has developed the HGK, a GPS/inertial guidance kit also tailored for Mk 80



series warheads. Small strakes are added to improve glide ranges, which can reach 15 nautical miles when the weapon is released from high altitude. A variety of impact profiles can be programmed to optimise weapon effects against different types of targets, ranging from a shallow dive (10°) attack to a vertical top attack. ■

Heron lands in Germany

BY DAVID DONALD

On Wednesday, Germany's parliamentary committee approved a \$600 million deal covering the lease of Heron TP medium-altitude, long-endurance (MALE) UAVs from Israel Aerospace Industries (IAI), which teamed in 2014 to bid for the deal with Airbus Defence and Space Airborne Solutions. The Germany-based Airbus unit will manage the programme, including all operational support. A budgetary rubber stamp is expected later this year.

Under the deal, Germany will receive seven Heron TPs, of which two will be used for training. They will remain in Israel when not required. A separate deal with the Israeli Ministry of Defence covers associated equipment, which may include the supply of weapons. The issue of Germany

operating arms-capable UAVs has been the source of considerable domestic controversy.

Intended to run for nine years from the latter part of next year, the contract will provide an interim solution for Germany's MALE UAV needs until a four-nation EuroMALE project is ready for service in the mid-2020s.

Drawing on experience with

the Heron 1, the Heron TP is a much larger 'strategic' UAV powered by a Pratt & Whitney PT6A turboprop. It is operated by Israel as the Eitan, and has been bought by India. The German lease follows on from a successful collaboration between IAI and Airbus to lease and support the smaller Heron 1, beginning with operations in Afghanistan from 2010 that resulted in more than 2,300 missions being flown. In 2016, German Heron 1s began operating from Gao in Mali, after the Bundeswehr took over the intelligence commitment for the UN MINUSMA operation. ■



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EN BREF

■ Pour conforter la dotation individuelle de ses soldats, le Danemark va acquérir de nouvelles jumelles standard, d'autres à télémètre laser incorporé, et encore des télémètres laser compacts.

(Stand 6J371)

■ Le **ministère** français des **Armées** prévoit des opérations de visites détaillées (épreuves d'étanchéité) de munitions sur des projectiles ou munitions au phosphore, et des destructions de munitions fumigènes chargées en phosphore. Sont concernés des obus de mortiers de 81 et 120 mm, des projectiles de 90 et 105 mm, et des obus de 155 mm.

(Stand 5aF20-178-268)

■ **Raytheon Systems** (France) est en charge de l'intégration de munitions air-sol GBU-48 et -50 des avions Mirage 2000D de bombardement de l'Armée de l'Air française, ainsi que de l'augmentation de la capacité de leur boîtier Epak, de deux à quatre munitions EPWII (14,6 M€).

(Stand 5aD578/5aF20-178-268)

■ L'obsolescence des SCC (Système Contrôle Commande) et de l'optronique de dix porteurs SPRAT (Système de Pose Rapide de Travure) du Génie de l'Armée de Terre française va être traitée par **Cnim** (France) (8 M€).

(Stand 5aF20-178-268/5aH267)

■ Le **Defence Support Group** (DSG) britannique a récemment attribué à **Supacat** (Royaume-Uni) un marché de maintenance et de service de réparation de 6,29 M€.

■ Des **Eléments des Forces Armées (EFA)** français vont recevoir de nouveaux matériels et équipements de plongée. (Stand 5aF20-178-268)



▲ Un bel ouvrage de 950 pages pour apprendre et comprendre

Russe ou Français ? Oui ! Da !

PAR ED SIPATSEL

Rédigé par Henri Goursau, Nicolas Novichkov et Ivan Polialov, une nouvelle édition du "Dictionnaire Russe-Français de l'Aéronautique et de l'Espace" vient de sortir. Publié en deux volumes par Henri Goursau, Editeur à Toulouse, il comprend quelque 100 000 mots et acronymes sur tout ce qui vole et ce qui y est relié.

(Stand 6B731)

Des skis pliants, ça existe !

PAR JEAN-MICHEL GUHL

Elan (Slovénie) a mis au point de très innovants skis pliants, assortis de bâtons à manches télescopiques. Ils peuvent être emportés dans un sac à dos, ou attachés dessus, en même temps qu'un fusil d'assaut, réduisant du même coup l'encombrement que ce genre d'accessoire peut générer pour un fantassin évoluant en montagne et en milieu neigeux. Divers accessoires complètent cet équipement (peaux de phoque, crochets à glace) en même temps que des chaussures à semelles rigides mais à tiges articulées. Les bons skieurs apprécieront !

(Stand 6J250)



▲ Les skis Elan repliés, attachés sur le sac à dos d'un mannequin

Des câbles bien protégés contre les IEM !

PAR JEAN-PIERRE HUSSON

On connaît bien de nos jours les effets délétères des impulsions électromagnétiques sur le matériel électronique ... Mais, celles-ci altèrent également toutes les liaisons entre éléments d'un système

déployé en campagne ou sur un navire. C'est pourquoi la firme helvétique Huber+Suhner a mis au point le câble de connexion Spuma RS, en thermoplastique polyuréthane (TPU) estampé, à très faible perte électrique et à haute

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► Une application utile pour le confort des visiteurs

résistance aux ondes parasites comme à la torsion. Le Spuma RS est par ailleurs insensible au feu et aux effets des éclairs, ce qui en fait un élément idéal pour les applications militaires.

(Stand 6J197)

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JLTV_007_2018-US-1

All-terrain vehicle ready for Austria



BY CHRISTOPHER F FOSS

Under a contract awarded in 2016 through the Swedish government, the Austrian Army is to take delivery of 32 of the latest-generation BAE Systems Hägglunds (Outdoor Stand A10) BvS 10 all-terrain vehicle (ATV).

The first Austrian BvS 10 completed its winter testing as part of trials in the Alps earlier this year and the first production

vehicles will be delivered to Austria in July 2018, with deliveries running until 2019.

On arrival in Austria, they will be fitted with government

furnished equipment, including the locally supplied ESL Advanced Information Technology remote controlled weapon station, which can be armed with a 7.62mm or 12.7mm machine gun or a 40mm automatic grenade launcher. On the lower part of the weapon station are banks of 76mm grenade launchers.

Other government furnished equipment will include a communications system and a colour camera to provide 360° situational awareness.

The baseline vehicle has four seats in the front and six seats in the rear, but the rear unit can be rapidly rerolled.

It is also fitted with a fire

IN BRIEF

The future is green

EURENCO (Hall 6, Stand F81) is very much looking to the future and is working on new technologies for the next decade. The company is focusing on three areas: customised 3D printing using fused filament fabrication and 3D solvent cast based on its own Nitrofilm technology, which will allow rapid prototyping for energetic materials; new explosive solutions and high-performance energetics that will lead to the development of future ammunition and bombs, which will be lighter and stronger; and green propellant technologies. Its research department has identified six 'green' stabilisers, from curcumin to alpha-ionone (derived from violets), which are more environmentally friendly and will reduce exposure to harmful substances for workers and users. They also represent better performance, as well as improved chemical and ballistic stabilities.

Puma enters Marder domain

PSM (Projekt System & Management) (Stand D230, External Pe6B) is prime contractor for the German Army's Puma armoured infantry fighting vehicle (AIFV), which has now started to replace the Marder 1A3/A4/A5 IFV in some units. PSM is a joint venture between Rheinmetall Defence and Krauss-Maffei Wegmann, with each

company having a Puma AIFV production line.

The German Army has placed contracts for 350 Pumas, including eight driver training vehicles; so far, 200 have been delivered, with production running at 66 vehicles a year. Final deliveries are due in 2020.

The Puma AIFV is fitted with a remote-controlled turret armed

with a Mauser 30mm MK 30-2 air bursting munition cannon and a 5.56mm MG4 coaxial machine gun. A number of capability enhancements are to take place.

Puma S1 includes improvements in the key areas of command and control and situational awareness, with a two-round launcher on the left side of the turret for the Spike LR anti-tank guided weapon also to be included under the S1 upgrade.

The current 5.56mm machine gun will be replaced by a 7.62mm gun under the S2 upgrade and Puma will also be fitted with the rear grenade launcher, which will be capable of firing lethal or non-lethal munitions over the rear arc.

Puma is being offered on the export market and was one of the vehicles recently tested in the Czech Republic, but the final downselect has yet to be announced. ■



detection and suppression system, air conditioning, NBC system, external stowage boxes and ski racks. Some of the Austrian vehicles will be fitted with a front-mounted snow-clearing blade.

The gross vehicle weight is being quoted as 16 tonnes, which is too heavy for amphibious use, but a swimming kit can be supplied for use when the vehicle is operating at a lower weight.

Austria is the latest customer for the BvS 10, which is already deployed by France, Netherlands, Sweden and the UK, the latter being the launch customer for deployment with the Royal Marines, who call the vehicle the Viking. ■

Jet contender for close air support

BY DAVID DONALD

Having announced a partnership agreement covering technical and marketing aspects in April, Czech airframer Aero Vodochody and Israel Aerospace Industries announced this week that they would be submitting a version of Aero's L-159 light combat aircraft for the US Air Force's OA-X close air support competition. The bid is something of a late entrant, but the companies assert that the L-159 represents a cost-effective and low-risk option.

The US Air Force has concluded the first phase of its Light Attack Experiment, with just the Sierra

L-159T1 two-seat version of the Iraqi Air Force



Nevada/Embraer Super Tucano and Beechcraft AT-6C Wolverine invited to participate in the second phase. Aero and IAI are pitching an advanced version of the L-159, which has seen extensive combat against Daesh forces with Iraq, claiming that the envisaged OA-X role would be better performed with jet-

powered aircraft rather than those with turboprops.

Having built 72 L-159s for the Czech air force in the 1990s, many of which were stored due to budgetary cuts and subsequently sold on to Iraq and US-based adversary contractor Draken International, the type is back in low-rate production. ■

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EN BREF

■ L'Égyptien **Tank Plant** (Military Factory 200) où sont construits et entretenus les chars Abrams égyptiens, va produire en 2018-2019 un nouveau véhicule blindé 4x4 dont le prototype est en cours d'essai avec un tourelleau téléopéré. Toute la conception a été réalisée par la société sud-africaine **Saksa Technologies (PTY) Ltd Engineering**. Les ponts avant et arrière T900 sont fournis avec leur suspension par **Texelis (France)** qui les produit sous licence **Timoney (Irlande)**. **(Stand 5aC268)**

■ Pour 40 M€, **BAE Systems Hägglunds** (Suède) va effectuer l'entretien et la réparation des blindés CV9035 estoniens, anciennement néerlandais. **(Stand 6K200)**

■ De nouveaux bancs de charge destinés à la maintenance des groupes électrogènes projetables de l'**Armée de Terre** française seront fournis par **Fauché Energie (France)** (1,9 M€). **(Stand 5aF20-178-268)**

■ Chez **Sert (France)**, et à l'heure du déjeuner, il est possible de déguster des "**Ravioles de Saint-Jean**", de la ville de Romans. Composée de farine de blé tendre, la petite pâte fine aux œufs frais renferme en son cœur une farce subtile et équilibrée, composée de Comté AOP, de fromage blanc frais, et de persil. **(Stand Pe6bB301)**

■ **Airborne Systems** (Royaume-Uni) va livrer des ensembles et sous-ensembles, ainsi que leurs recharges, des EPC (Ensembles de Parachutage du Combattant) français. **(Stand 5aD499/5aF20-178-268)**

Un buggy très spécial pour forces spéciales !



▼ **L'étonnant buggy de grand raid Scorpiq a une autonomie de 800 km**

seurs souples à grand débattement. Il peut emporter 700 kg de charges utiles (eau, nourriture, munitions...) et rouler jusqu'à une vitesse maximum de 160 km/h, une fois équipé de pneumatiques BFGoodrich pour sable et gravier ! Buggy d'assaut, il bénéficie de l'expérience de la société **Booxt** dans la réalisation de buggies tout-terrain de grand raid déjà utilisés dans plusieurs rallyes dans le sud désertique du Maroc. Quant à la maintenance, elle est réduite, sachant que tous ses éléments mobiles sont issus de véhicules PSA courants. Une version ultérieure sera produite avec une propulsion hybride, un moteur électrique avec 20 minutes d'autonomie permettant d'approcher un objectif de manière complètement silencieuse... **(Stand 6K67)**

PAR JEAN-MICHEL GUHL

Exposé sur le stand Michelin, le Scorpiq, un drôle de véhicule dominé par Bibendum en personne attire le regard des visiteurs. Il ne s'agit pas d'une réalisation du fabricant de pneumatiques mais d'un geste auguste de cet industriel au profit d'une PME ardennaise,

le groupe **Roze**. Celle-ci devrait prochainement réaliser plusieurs de ces engins tout-terrain légers au profit des forces spéciales françaises. Mû par un moteur Peugeot Diesel de 180 ch, ce buggy 4 places de 1 000 kg, aérotransportable, est muni d'une caisse tubulaire très rigide montée sur amortis-

La faim justifie les moyens

PAR FRÉDÉRIC LERT

Faut-il survivre pour manger ou manger pour survivre ? Jomispa (Espagne), 35 ans d'expérience dans la nourriture du soldat, a fait son choix en proposant une ration de combat qui bat des records de compacité et promet à son utilisateur de survivre un jour de plus... Qu'on en juge : un emballage de la taille d'un livre de poche, 500 g sur la balance et 1 250 calories à dévorer sans retenue pour tenir

une journée, ou même deux jours en se serrant un peu le ceinturon... Pour mémoire, les rations traditionnelles, beaucoup plus volumineuses et lourdes, offrent des menus à environ 3 000 calories. La ration "Survival pack" comprend des barres énergétiques, des gelées de fruit, du chocolat, des tablettes de purification d'eau. Et, en plus de tout cela, elle aurait bon goût ! De quoi donner envie de faire la guerre... **(Stand 5aE805)**

▼ **Le "Survival pack" tient dans la main et fond dans la bouche. Contrat rempli !**



Pour un espace propre

PAR JACQUES DE LESTAPIS

Les sociétés françaises Clean Air Technologies et Securotec ont livré à Airbus Defence & Space un sas d'habillage mobile ISO 5 ultra-propre, avec contrainte de propreté biologique. Il est dévolu à la mission Exomars 2020 russo-européenne, déterminante dans l'apprentissage des signes de vie possible sur la planète Mars. Ce sas se raccorde à un flux laminaire conventionnel où est préparé le rover Exomars 2020 pour ses essais mécaniques. La maîtrise de la politique de protection planétaire (ne pas contaminer les objets célestes que l'humanité explore) est, en effet, déterminante.

(Stands 6G657/5aC158)

Le VSR700 devient adulte

PAR FRÉDÉRIC LERT

Airbus Helicopters (France-Allemagne) et Hélicoptères Guimbal (France) coopèrent sur le programme VSR700 pour la mise au point d'un drone embarqué à voilure tournante. Airbus fournit l'avionique, le pilote automatique, la liaison de données, le système de mission et la station sol, alors que son partenaire apporte la plateforme dérivée de l'hélicoptère biplace Cabri G2. Tandis que les essais se poursuivent avec un Optionally Piloted Vehicle (un Cabri spécialement modifié), le premier prototype du VSR700 devrait voler en fin d'année. Puis, un deuxième prototype de VSR700 sera mis en vol en milieu d'année prochaine. Plus tard, après 2020, la version SDAM (Système de Drone Aérien pour la Marine nationale) aura droit à son propre démonstrateur. Avec ses 700 kg au décollage, le VSR700 promet une autonomie de 8 heures de vol à 80

nautiques de son navire porteur, avec, à son bord, deux charges utiles principales : un radar et une boule optronique. La première mission du drone sera de surveiller, d'aller chercher de l'information. Dans un deuxième temps, au gré des développements, il pourra être équipé de bouées acoustiques et même d'armement (missiles légers). L'objectif d'Airbus Helicopters est de disposer d'une première version export de l'appareil au début des années 2020. L'hélicoptériste annonce avoir déjà reçu des marques d'intérêt de la part de plusieurs marines, en attendant le lancement de divers appels d'offres. (Stand 5aKL9)

▼ Pour à peine 700 kg au décollage, le VSR700 offre un niveau de performances que l'on pensait réservé à des appareils bien plus lourds. Ici l'Optionally Piloted Vehicle servant au développement



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STAND F 528,
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Firing further

BY SAM J BASCH

With an eye on a qualitative improvement in the performance of Spain's artillery gun-howitzers, the Army Logistics Support Command has just awarded Expal Systems (Hall 6, Stand F133) a five-year ammunition contract.

In terms of the framework agreement, Expal will supply the Spanish Army with 155mm ER02A1 extended range HE projectiles for the SIAC 52-calibre and M109A4 39-calibre howitzers. The munitions will include an EC102 electronic fuze, a base-bleed unit and the DM92ES modular charge.

Expal has designed and manufactured the projectile, fuze and base-bleed unit as part of an MoD partnership programme. Complying with the JBMOU that ensures compatibility with different types of 155mm howitzers, Expal munitions are also qualified in accordance with NATO's STANAG standards.

With the aerodynamically streamlined ER02A1 projectile and base-bleed that reduces its base resistance, a substantial increase in range is achieved. Firing with six propelling charge modules, the 52-calibre SIAC



howitzer can now reach a range of 40km.

Improved design features and a larger amount of explosive in the projectile enhance its fragmentation performance. Importantly, the electronic

fuze not only provides greater operational precision but also higher safety levels than when using a mechanical fuze.

Further precision will soon be able to be achieved with the integration of a trajectory

Here comes the Cavalry



BY DAVID DONALD

The US Army's famous Cavalry hat is much in evidence at Eurosatory, thanks to an impressive outside display of US Army firepower sponsored by General Dynamics Land Systems and Lockheed Martin, and which comes under the umbrella of the AUSA-organised US Pavilion.

Much of the 'heavy metal' on show comes from the service's famous Cavalry regiments, which are either based in Europe or are here as part of a nine-month rotational deployment. The Army's latest battlefield helicopters, the Boeing AH-64E Apache Guardian (*pictured*) and Lockheed Martin/Sikorsky

UH-60M Black Hawk, are represented by examples from the 1st Air Cavalry Brigade's 1-227 AVN and 3-227 AVN, respectively.

The parent 1st Cavalry Division's 2-8 CAV is presenting the M1A2 SEP, the upgraded version of the US Army's Abrams main battle tank.

Outside Hall 5A is another collection of US Army vehicles, comprising an M109A6 Paladin self-propelled howitzer, also from the 1st Cavalry (1-82 FA), while the 2nd Cavalry Regiment is displaying an ICV-D Dragoon version of the Stryker infantry fighting vehicle.

Completing the display of US Army in-service hardware is a Patriot launch system from the 7th Air Defense Artillery, part of US Army Europe's 10th Army Air and Missile Defense Command. ■

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correction fuze for missions that require such precision on a target under fire.

Expal is also presenting a new configuration of its EIMOS 81mm mortar system integrated on a light 4x4 vehicle.

Easing communications

Honeywell has recently demonstrated its HSD-400 voice and high-speed data transceiver aboard the UH-60 Black Hawk and CH-53 Stallion helicopters. Such systems expand and ease communications between the platforms and their command and control centres, enhancing encrypted voice transmissions while also allowing the transfer of high-quality video.

Designed by Honeywell (Hall 5A, Stand D367) for use on board both larger fixed- and rotary-wing platforms, the HSD-400



offers up to four communications channels, each with a data rate of 432kbps. The system uses Inmarsat High Data Rate services to provide a wi-fi capability to the platform, and eliminates

the disturbances that can be caused by the rotating blades of a helicopter. Compatible with a range of antennas, the HSD-400 is available as an upgrade or as part of new installations.

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Ammunition investment

BY CHRISTOPHER F FOSS

BAE Systems Land UK is investing around £10 million in its ammunition production capability with the decision to build a new production line for 12.7mm ammunition at the Radway Green small arms ammunition facility, adding up to 10 million rounds a year.

The company is working with the University of Sheffield's Advanced Manufacturing Research Centre to design the new production line, which will use the latest manufacturing technology to maximise efficiency and quality.

The British Army has bought significant quantities of .50 M2 machine guns, many for protected weapon stations (PWS) or remote weapon stations (RWS) installed on British Army and Royal Marines platforms. The Norwegian Kongsberg RWS is becoming the UK's standard RWS and is usually armed with a stabilised .50 M2 machine gun. While referred to as a 12.7mm round, it is more correctly called the .50 cal round, with the gun entering service back in 1933.

BAE Systems Land UK has already established new production lines for 5.56mm and 7.62mm ammunition at Radway Green and has won significant export orders for both calibres. Total investment in Radway Green is about £83 million and the facility can produce one million rounds of 5.56mm or 7.62mm ammunition a day. ■

Famous names return to deliver

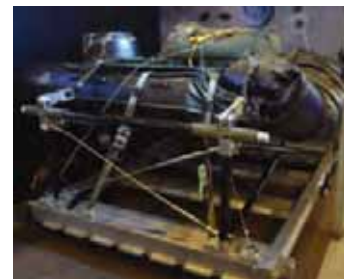
BY DAVID DONALD

This week the UK-based element of the Airborne Systems group has rebranded as IrvinGQ, bringing back two of the most famous names in parachute history to the market. Based in Wales, IrvinGQ focuses on the 'round-chute' systems, while US-based Airborne Systems continues to focus on 'square' chute systems.

Being shown at Eurosatory by IrvinGQ (Hall 5A, Stand C751) is a new aerial delivery system that offers considerably more flexibility in operation, as well as reduced cost and greater safety. Known as ATAX, the modular system can be applied to both land and marine air-drop requirements, which previously

required separate systems. ATAX comprises interlocking pallets that can be joined together to match the size of the load. The system can handle loads from as little as 900kg (2,000 lb) up to 19,050kg (42,000 lb), which is the US Army's current heaviest air-drop load requirement. The system is actually capable of at least 27,215kg (60,000 lb) to cater for future needs.

Another advanced feature of ATAX is a new air bag system for land drops, which currently employ a cardboard cell cushioning arrangement that cannot be reused and is sensitive to climatic conditions. The air bag drops down from the pallet by gravity and is self-inflating



during the load's descent. When the load lands, the bag bursts a patch on its upper surface, which constricts the escape of air to provide a cushioned deceleration. This air bag is reusable by the simple process of replacing the patch. ATAX is now fully certified and ready for production. It can be used by all major transport aircraft types, including the C-130, A400M and C-17.

A related system from IrvinGQ is the transfer safety link assembly, which ensures the load's chutes do not deploy until the load has safely left the delivery aircraft. ■

From land and sea to space

BY SAM J BASCH

An impressive array of photonic technologies greets visitors to the UK-based Excelitas Qioptiq display in Hall 5A, Stand B740. On show at Eurosatory are sighting systems, surveillance and target acquisition cameras, such as the new CheetIR-C MWIR continuous zoom, sensors and detectors, as well as advanced optronics.

The CheetIR-C OEM variant allows excellent potential for integration into sighting system upgrades, including under-armour applications. A range of

features, including white hot/black hot and electronic zoom, enables the detection of a main battle tank at more than 25km.



In the sensor domain, Excelitas Technologies' portfolio includes new COTS products to meet the requirements of semi-active laser seeker applications. Its YAG-555-4AH Silicon PIN Quadrant Detector, with up to 14.1mm

active area diameter, captures even more photons, and with built-in heating elements, enables an increase in effective responsivity.



Excelitas is well established in the space sector for its solar cell cover-glass and optical solar reflectors (OSRs). OSRs are employed on civilian and military satellite programmes in Europe, the US and Japan. Its cover-glass, designed to protect the photovoltaic cells of satellites from the harsh space environment, will be produced in North Wales. ■

A Eurosatory, on embauche aussi !

PAR TOUCHINE TRAN

Organisé par le GICAT, aujourd'hui, vendredi, est aussi la "Journée des Métiers – Opération Carrière" dédiée aux étudiants et jeunes professionnels en quête d'un emploi, ou à la recherche d'une carrière dans l'industrie européenne de Défense et de Sécurité terrestre et aéroterrestre. Pour eux, c'est là l'opportunité de rencontrer aisément et individuellement les industriels qui recherchent de nouveaux profils, et de répondre ainsi à leurs enjeux de recrutement. Par exemple, cette année, en France, le groupe Nexter doit pourvoir 600 postes sur l'ensemble de ses sites alors qu'Arquus en propose 150.

(Stands 5aF21/Pe6bB170/5aF267)

Les futurs LTTV belges

PAR JACQUES
DE LESTAPIS

Jankel (Royaume-Uni) a deux programmes en cours pour la Défense belge : le 4x4 Fox Rapid Response Vehicle (RRV), en cours de livraison et que l'on peut voir à Eurosatory, et le Light Troop Transport Vehicle (LTTV). Livrable en 2020-2021 et commandé à raison de 199 unités, ce dernier est un 4x4 monté sur un châssis Unimog 5000 à moteur de 220 ch. Tout-terrain, il sera équipé d'un système numé-

► Le LTTV est un véhicule de la classe des 9 tonnes



rique VoIP d'intercommunications, d'un treuil de 8 tonnes de capacité, de roues Runflat R20, de deux batteries 14 VDC, et d'un Battery Management Systems. Les LTTV seront livrés avec 175 modules de mission

interchangeables, 42 kits de protection balistique, 159 mitrailleuses de 12,7 mm et leur affût, 167 supports pour 7,62 mm, et 167 lance-pots fumigènes.

(Stand 5aB268)



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EN BREF

■ Le radar de surveillance périmétrique PSR-500 de **Rockwell Collins** (France), dans sa version militarisée, est conçu pour détecter et repérer toute tentative d'intrusion sur des sites sensibles, par tout temps, de jour comme de nuit. À technologie FMCW à illumination permanente, il permet encore de traquer un individu ou un véhicule jusqu'à un kilomètre de distance et dans une zone définie. Si des bases françaises en sont déjà équipées, les forces spéciales, EDF, ou encore la SNCF, s'y intéressent. En effet, pour voir avant d'être vu, il est un complément de choix aux caméras thermiques ou optiques. (Stand 5aB438)

■ Le navire polaire logistique (PLV - Polar Logistic Vessel) français va bénéficier de deux nouvelles embarcations légères et rapides de **Zodiac Milpro** (France) (1 M€). (Stand 5aF20-178-268)

■ Le **Ministerium für Inneres** allemand a commandé des fusils **Sig-Sauer** (Allemagne/États-Unis) 5,56x45 mm. (Stands 6E81/6E131)

■ Différentes améliorations doivent être apportées aux hélicoptères Tigre de l'**ALAT** française, soit la revalorisation des casques par **Thales Avionics** (France) (1,163 M€), alors que **Nexter Systems** (France) va traiter l'obsolescence électronique de l'armement canon (8 M€). (Stands 5aF20-178-268/Pe6B500/Pe6bB170)

■ Les systèmes de visée chef de char des Challenger 2 britanniques et leur conduite de tir vont être l'objet de maintenance et de réparation par **BAE Systems Global Combat Systems** (Royaume-Uni). (Stand 6K200)

Adapté à toutes les mains



▲ Le Glock 19X est livré en mallette assortie à la couleur de l'arme, avec chargeur, kit de nettoyage et trois chargeurs

PAR JEAN-PIERRE HUSSON

Dernier-né des pistolets Glock (Autriche), le modèle 19X est dérivé du semi-automatique développé pour le programme MHS (Modular Handgun System) de l'US Army.

Reprenant bon nombre de caractéristiques des modèles Glock à carcasse en polymère de la famille Gen5, il combine la glissière compacte et le canon de 4 pouces (102 mm) du Glock 19,

avec la carcasse "full size" du Glock 17, créant ainsi un hybride parfaitement réussi, idéal pour toutes les conditions d'utilisation et situations tactiques. Chambré pour la 9x19 mm standard Otan, il se caractérise avant tout par sa finition Coyote, obtenue par revêtement PVD (Physical Vapor Deposition, pour "dépôt en phase vapeur sur nitruration"), qui confère une très grande résistance à l'usure et à la corrosion. Autres caractéristiques de l'arme : un canon GMB (Glock Marksman Barrel) à rayures polygonales améliorées, pour une meilleure précision, une poignée sans empreintes pour les doigts, adaptée à la main d'une plus grande majorité d'utilisateurs, des commandes ambidextres, une attache de dragonne montée à l'origine, des organes de visée luminescents, et des dos de poignée interchangeables. L'arme mesure 186 mm de longueur totale pour un poids de 600 g, sans le chargeur. (Stand (5aK367)

AML ? Toujours prête !

PAR JACQUES DE LESTAPIS

Sofema (France) et Thales CS présentent un prototype de modernisation de véhicules blindés anciens sur une base d'AML-90 Panhard. C'est là une offre complète et modulaire qui peut se dupliquer pour tout autre type d'engins de combat. Elle porte sur : motorisation, chaîne cinématique, énergie, conduite de tir jour-nuit, LSA, climatisation, radio, interphonie, système de combat numérisé. Le coût d'un tel blindé entièrement modernisé est d'environ 1/3 de son prix neuf. (Stands Pe6aB371)



▲ L'inoxydable AML gagne une nouvelle vie avec la modernisation proposée par Sofema et Thales. Un punch redoutable pour un véhicule plus petit qu'un SUV actuel...

L'œil du Caesar®

PAR ED SIPATSEL

Dans la suite de contrats de fourniture de viseurs optroniques sur la tourelle ARX®20 et l'affût Narwha® téléopérés de Nexter Systems (France), la caméra thermique non refroidie Thor d'Exavision (France) est retenue pour être intégrée sur le canon automoteur Caesar® "haute intensité" de 155 mm/52 sur châssis tchèque 8x8 Tatra T815. Légère et compacte, dotée d'un capteur 17 µm de résolution 640x512 pixels et d'un objectif bifocal de 45/135 mm, offrant respectivement un champ de vision de 13,8 et 4,6°, elle peut identifier une cible Otan (2,3x2,3 m²) jusqu'à 2 km.

(Stands 5aD158/Pe6bB170/5aK600)

► Le Caesar® 8x8 a été commandé par le Danemark (15 + 6 options)



Pour drones et robots



◀ A Eurosatory, la chaîne vidéo numérique de l'ASIO-155HD est présentée pour drone de surveillance du trafic maritime

PAR JEAN-MICHEL GUHL

Parmi les tourelles optroniques compactes d'Inpixal (France), voici venir l'ASIO-155HD, un équipement stabilisé sur trois axes, offrant une voie jour (avec zoom x30) et une voie infrarouge, utilisable pour les missions de détection, de surveillance ou de géolocalisation. L'ASIO-155HD est "ITAR Free" et doit son nom à son diamètre de 155 mm, le tout pour un poids plume de 1,6 kg. Son intégration est ainsi très simple sur de nombreux véhicules légers, au sol, en mer, ou dans les airs.

(Stand 6FG732)

FMA pour sauver des vies

PAR JACQUES DE LESTAPIS

Lorsqu'un soldat est blessé, chaque minute compte. Sur les théâtres d'opérations extérieures, au défi du temps, s'ajoutent ceux de la logistique et des contraintes de communication. Pour accélérer la prise en charge médicale en milieu opérationnel, le Système d'Information de Régulation Médicale (SIRMED) est développé par le groupement français Sopra Steria et Ineo Defense, sous le pilotage de la DGA, au profit du Service de Santé des Armées (SSA) françaises. Part du programme d'armement ISSAN (Info Structure SANTé), il vise à améliorer le soutien médical des forces projetées à l'étranger, notamment par la numérisation de la chaîne santé. S'agissant de la prise en charge d'un blessé, ce système permet aux équipes de soin "de l'avant" de créer la FMA (Fiche Médicale de l'Avant) du soldat sur une tablette tactile et de renseigner les premiers soins prodigués. (Stands 5aH268/6K137/5aF20-178-268)



► SIRMED informe en temps réel le médecin régulateur, puis l'antenne d'accueil, de l'état du blessé

EN BREF

■ Technamm (France) et la Société Française de Commerce Européen se partagent à parts égales un marché de fournitures aux autorités françaises de véhicules légers et pick-up de 3,5 à 6,5 tonnes, 4x4 rustiques, blindés ou non protégés. Portant le nom de Masstek, ils sont réalisés sur châssis Toyota HZJ79. (Stand 3bG150)

■ Dassault Aviation et Davey-Bickford (France) assurent pour la DGA la qualification des propulseurs F2000 chargés avec la poudre NC1397. (Stands 6L351/5aF20-178-268)

■ Des bipieds de Promotek (Suède) seront livrés au FMV (Suède) pour équiper les fusils d'assaut suédois Ak 4D, versions suédoises du HK G3A3 allemand. (Stands 6H420/6K616)

■ En octobre prochain, le Qatar va dévoiler son savoir-faire en matière de blindés à roues. Il s'agit de deux modèles 4x4, l'un de 14 tonnes et l'autre de 18 tonnes. La chaîne cinématique complète avec groupe motopropulseur Cummins/Allison est fournie par Texelis (France) (Stands 5aH721/5aD577/5aC268)

■ Pour un montant de 19 M€, Naval Group doit remplacer les radars de navigation des frégates Horizon françaises. (Stands 5aF20-178-268)

■ La Défense française recherche des plaques de protection balistique de différentes classes (IV, ou C7 selon le Stanag 2920, dont des Stand Alone; III A5, ou B4; et III++, ou C4), pour une valeur estimée à 22 M€, hors TVA. (Stands 5aF20-178-268)

BrahMos takes flight

In November 2017, BrahMos Aerospace and India's Defence Research and Development Organisation (DRDO) conducted the first air launch of the BrahMos supersonic cruise missile. The weapon was launched from an Indian Air Force (IAF) Sukhoi Su-30MKI as the first stage of clearing the weapon for IAF deployment. Forty Su-30s are being modified to fire the missile, which could become operational by the end of this year.

BrahMos is a joint venture between the DRDO and Russia's NPO Mashinostroyeniya to develop versions of the Russian P-800 Oniks supersonic weapon for air-, ship-, submarine- and ground-launched use. The weapon has a first-stage rocket for acceleration and a ramjet for sustained flight.

Developments continue, and a BrahMos II with hypersonic capability of around Mach 7/8 is being worked on. A smaller BrahMos-NG is more of a priority, a missile that retains the Mach 3+ speed and 290km range of the original but in a lighter, shorter body. This has particular applications for air launch, the original missile being too large for carriage by many potential platforms. ■



A screen-grab from a DRDO video shows the first air launch of a BrahMos



BY CHRISTOPHER F FOSS
The Streit Group (External Pe6A, Stand A480) is showing two of its latest wheeled armoured vehicles. As with its other products, these have been developed using internal R&D funding for the export market, with production being undertaken in North America, Europe, Africa, the Middle East or Asia depending on where the end user is located.

The first of these is the Gepard Armoured Security Vehicle (ASV, pictured), which has enabled Streit to expand its range of wheeled armoured vehicles even further. Gepard is stated to have a high level of off-road capability and is powered by a 6.7-litre V-8 turbocharged diesel engine coupled to a fully automatic transmission. A 6.8 litre V-8 petrol engine is an option.

The second vehicle is the Python-SUT (Support Utility Transport), which is based on a Toyota 4x4 platform for which spare parts are available from a well-established worldwide dealership. Python-SUT is stated to already be in production with undisclosed customers and typically has a crew of four including the driver, but a version with increased capacity is also available.

The gross vehicle weight of the Python is being quoted as 5,520kg, of which 800kg is the payload. Ballistic protection is to CEN Level BR6 and blast protection to 2 x DM51 grenades, but higher levels of ballistic and mine protection are available.

As usual, a wide range of options is available, including a five-door version, run-flat tyres, a remote weapon station, a self-recovery winch, right-hand drive, and a rear-view camera. ■



Re-roled on command

Rheinmetall Defence (External Pe6B, Stand C021) has rapidly converted its latest KF41 Lynx infantry fighting vehicle (IFV) into a command post vehicle. This has a raised roof line to provide greater internal volume for its specialist battlefield mission.

On the roof is fitted the latest Fieldranger remote-controlled weapon station armed with an integrated externally driven RMG.50 Rheinmetall machine gun (MG).

On Tuesday this week, Rheinmetall launched the KF41

in the IFV configuration, fitted with a turret armed with a 35mm cannon, a 7.62mm coaxial MG, a roof-mounted 12.7mm remote controlled weapon system, and a pod of two anti-tank guided weapons (ATGWs) integrated into each side of the turret. ■

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Left: Mercedes-Benz (4x4) cross-country truck being put through its paces. This model is fitted with the standard rear cargo body but a wide range of bodies can be fitted. Behind is the Mercedes G Wagon. Below: small robotic vehicles are being used for an increasing number of military and paramilitary roles



Right/far right: The Arquus Dagger (4x4) light protected patrol vehicle is now being marketed for the internal security and police missions. Such vehicles enable police to be rapidly deployed, and allow them to get close to their objective with armour protection



Left: The Paris Fire Brigade (Le Brigade de Sapeurs-Pompiers de Paris) is an Army unit that operates under the authority of the Police Prefecture of Paris and, with more than 8,500 men and women, is the third largest fire brigade in the world



Above: a deFNder medium remote weapon integrated onto a THeMIS UGV from Es

2018

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Right: The Arquus Sherpa (4x4) can be adopted for a wide range of battlefield missions and is available in two-door, four-door and open-topped variants. This is the four-door fully enclosed version, which can be fitted with a number of roof-mounted weapon systems



Left: Manitou material handling equipment being used to unload a container. The French company's range includes telehandlers, forklifts, and articulated and backhoe loaders



Right: The Streit Group's SHERP is a true all-terrain vehicle able to conquer any landscape. It can swim and climb out of water, and ascend a 1m step



pon station from FN Herstal has been
tonian company Milrem Robotics

EN BREF

■ La Finlande a commandé des munitions de 57 mm auprès de **BAE Systems Bofors** (Suède).

(Stand 6K200)

■ La maintenance opérationnelle des équipements de terrain déplaçables en France métropolitaine – un marché de 202 M€ – a été attribuée par la **DGA** aux entreprises françaises **Spie**, **Aximum** et **Cegelec**.

(Stand 5aF20-178-268/6F677)

■ **Nexter Systems** et **Renault Trucks Défense** (aujourd'hui appelée **Arquus**), cotraitante, entreprises françaises, vont mettre en place la revalorisation de VBCI de l'**Armée de Terre** française avec des prestations d'intégration supplémentaires (53 M€).

(Stand Pe6bB170/5aF267/5aF267/5aF20-178-268)

■ Le **Danemark** veut doter certains de ses véhicules à roues non blindés d'un système jour/nuit de surveillance, de détection, et de géolocalisation des tirs adverses.

(Stand 6J371)

■ **Euro-Shelter** (France) a en production des abris techniques "GM200" et "GM400" destinés à **Thales Raytheon Systems** (TRS) (France).

(Stand Pe6bB170/Pe6B500)

■ **Alliantech** (France) va fournir à la **DGA** des systèmes de conditionnement de capteurs et d'acquisition de données. Autonomes, modulables et compacts, ils sont embarquables dans un véhicule soumis à des essais de survivabilité dans un contexte d'agression du champ de bataille. (Stand 5aF20-178-268)

Nouvelle jeunesse



▲ De technologie infrarouge, Second Chance ajoute un plus à la détection chimique à distance

PAR JEAN-PIERRE HUSSON

Exposée chez Bertin Technologie (France), la caméra Second Chance connaît un nouveau développement grâce aux recherches menées par

l'Onera dans le domaine de l'imagerie multi-spectrale. Développée dans les années 2000 et conçue pour la surveillance de sites publics et industriels critiques, Second

Chance permet la détection à distance d'une menace chimique, basée sur une technologie infrarouge. Ces nouveaux développements sont issus d'un partenariat, baptisé Cubix, signé en 2016 entre Bertin Technologie et l'Onera, qui transfère le fruit de ses recherches à l'industriel français, passé maître en matière de détection chimique à distance. Cubix est soutenu financièrement par Bertin et va aboutir à des solutions opérationnelles robustes aux fausses alarmes, plus compactes et plus rapides que celles disponibles aujourd'hui. Il sera possible ainsi d'embarquer Second Chance sur un véhicule, voire sur un aéronef (drones, hélicoptères...), pour évaluer les risques chimiques à distance, tout en bénéficiant d'une détection fiable même à très faible concentration. (Stand 5aH267)

Neutralisation des engins et explosifs

PAR ED SIPATSEL

En partenariat avec ECA Robotics et Scopex, Cefa (France) a remporté le contrat Sminex de la DGA portant sur les matériels de neutralisation des IED, munitions non explosées et autres objets explosifs suspects. C'est là un programme innovant car porteur d'une approche globale en matière d'équipements pour les trois armées (Air, Terre, et Marine) françaises, depuis les protections individuelles jusqu'aux détecteurs portables, systèmes à rayon X, canons disrupteurs et autres robots (106 M€).

(Stand 5aJ267/5aB248/5aF20-178-268)



▲ Dévisseur pyrotechnique

EN BREF

■ Pour le maintien de son interopérabilité avec les systèmes en interface et l'intégration de nouveaux entrants dans la simulation instrumentée, l'évolution du **STC AL NG** (Simulateur de Tir de Combat pour Armes Légères Nouvelle Génération) français est lancée. **Ruag Defence France** en est chargée (12 M€).

(Stand 5aF20-178-268/6K110)

■ Concevant et intégrant des solutions de systèmes robotiques pour la Défense, la Sécurité et la Sûreté, **Roboost** (France), en partenariat avec **TrustComs** (France), présente le **DroneBlocker**. Il s'agit d'un système de détection des drones et de leurs pilotes. Il les identifie, alerte, les traque et les neutralise d'une manière "smart", progressive et réversible, en prenant leur contrôle.

(Stand 6G627)

■ **Sonergie** (France – Nato Cage Code: FA6A6) conçoit et fabrique des groupes électrogènes, armoires électriques et onduleurs, et assure leur installation et leur maintenance. Fixes ou mobiles, classiques ou hybrides (photovoltaïque, batteries,

huile végétale, hydraulique ou éolien), ces matériels, dont la nouvelle gamme **Paris**, 100 % française, peuvent être couplés afin d'assurer une continuité d'approvisionnement en énergie, même en cas de défaillance d'une unité. Ainsi éviter toute coupe ou perte de puissance. Le service aux armées de Sonergie est assuré par la société **Henri Blanc SA**.

(Stand 5aF21)

■ La surveillance automatisée de frontières ou d'installations stratégiques est un secteur en plein expansion sur lequel **Magna** se développe. La société israélienne propose des solutions clef en main basées sur la reconnaissance d'images et l'imagerie stéréoscopique adossées à différentes solutions d'intelligence artificielle pour augmenter la réactivité des équipements automatisés et limiter le nombre de fausses alarmes.

(Stand 6C712)

■ Nouvellement acquis par les **Affaires maritimes** françaises, le palangrier ex Ile de la Réunion, de 55 m, va être transformé en patrouilleur de surveillance des pêches en Terres Australes et Antarctiques Françaises (TAAF). Un bossoir et un canot d'intervention vont l'armer.

(Stand 5aF20-178-268)

■ Le **Metropolitan Police Service** britannique dispose d'une ligne de crédit de 10 M£ pour l'achat de cartouches opérationnelles et d'entraînement, à blanc et à colorants, de calibres 9 mm, 5,56x45 mm, 300 BLK, 7,62x35 mm, et 7,62x51 mm, ainsi que des moyens pyrotechniques de "distraktion".

■ Le Pont Flottant Motorisé (PFM) de **CNIM** (France) est une solution dédiée au franchissement de brèches humides en service dans plusieurs armées, en France mais aussi en Italie, en Suisse ou en Malaisie. Avec deux configurations possibles – pont continu ou ferry –, il offre un avantage tactique certain: il peut être facilement déployé, en un temps réduit et avec un minimum d'hommes.

(Stand 5aH267)

■ **WB Group** (Pologne) et le **ministère malais de la Défense** ont récemment signé un accord de compensation économique portant sur un transfert de technologie. Le système polonais C² d'intercommunication tactique numérique Fonet et la radio Radmor 35010 WIT (Wireless Intercom Terminal) de WB comptent parmi les équipements de 257 blindés 8x8 AV8 Gempita construits en Malaisie en douze versions différentes.

(Stand 5aH647)

■ **Ineo Defense** (France) développe et réalise pour la **DGA** (France) 540 **SAVEC** (Système d'Arrêt de Véhicules à Effets Contrôlés), matériels anti-franchissement, de type filet, capables d'arrêter un véhicule sans causer de dommage irréversible de son propre fait sur l'équipage comme sur le véhicule (32 M€).

(Stand 6K137/5aF20-178-268)

■ Les **Carabinieri** italiens ont commandé auprès de **La Griffa** (Italie) 12 500 tricots ras du cou

bleus, 3 200 pull-overs en laine noire, et 6 000 sous-vêtements thermiques (1,29 M€).

(Stand 6D463)

■ Cent cinquante millions d'euros ont été attribués à **Safran Electronics et Défense** (France) pour les évolutions du **FELIN** (Fantassin à Equipements et Liaisons Intégrés) 2017 français. L'entreprise détient aussi un marché de valorisation VAB Observation (6 M€).

(Stand 6F80/5aF20-178-268)

■ La mise en place et la maintenance des liens de télécommunications sécurisés et fiables entre les radars automatiques routiers français, le Centre National de Traitement (CNT), la Direction des Systèmes d'information et de la Communication du **ministère français de l'Intérieur** et les sites des prestataires du Département du Contrôle Automatisé, ont été remportées par **Worldline** (France) (24 M€).

(Stand 5bD10/5aB178)

■ Dans sa lutte contre l'immigration illégale et la contrebande, le **Secretary of State for the Home Department** britannique va acquérir un radar de surveillance côtière, d'une portée de 8 à 10 milles sur 180°, à même de détecter des embarcations de type RHIBS évoluant le long du Kent, face à la France.

■ Ce sont 34 000 étuis porte-chargeurs simples, pour le port en uniforme, pour pistolets Sig Sauer SP2022, et 40 000 doubles, pour Mas G1, qui sont prévus pour la **Police** et la **Gendarmerie nationales** françaises sur quatre ans. Pour le port dissimulé, ce sont, en plus, 104 000 étuis, pour SP2022, et 24 000, pour Glock 26. (Stand 5bD10/6E81/Pe6B170/5aK367)



IN BRIEF

Linked intelligence

Brazil-based Atech (Hall 5A, Stand K387), part of Embraer, is presenting its Arkhe line, a full range of products and services for defence and public security. Arkhe Intelligence contributes to the processing of large amounts of data and information for military or civilian missions. By supporting pattern identification, it contributes to better mission planning. In turn, Arkhe Data Analysis uses high-performance solutions for storage, distribution and analysis of data from a range of sources, such as videos, cameras, sensors, network messages and radars. An example is analysing data on regions with a high incidence of non-identified flights, cross-referenced with data on regions showing high volumes of clandestine narcotics sales, to then prompt a criminal investigation.

Drone compliance

The Association for Unmanned Vehicle Systems International awarded Consortiq's (Hall 5A, LAB 14) US training and education programme top spot at the Xponential conference in Denver last month. An instructor's practical experience and thorough knowledge of security measures count as decisive factors when selecting a training provider. Consortiq's instructors collectively possess more than 40 years of flying, 20,000 commercial hours and eight years in the civilian drone industry. Importantly, Consortiq integrates its training into CQNet, rated the best cloud services provider in 2017. CQNet assists with the regulatory compliance and produces actionable data for a complete and resilient drone ecosystem.

Armoured vision

UK-based Spafax International (Hall 5A, Stand D821), a manufacturer of unbreakable military vehicle mirrors, is introducing its Armoured Vision mirror range. Designed to eliminate blind spots on armoured vehicles, the new mirror incorporates high-definition IP-rated cameras within the unbreakable mirror body. Manufactured from injection-moulded optical grade polycarbonate, Spafax mirror lenses are optically perfect, without distortion. Outperforming glass, acrylic and steel, these lenses will not discolour with the effect of ultraviolet rays present in sunlight. Each lens is sealed and protected by a special coating, which provides scratch resistance and repels condensation and surface water.



Small red-dot sight

A long-requested requirement from customers for a small enclosed red-dot sight for handguns, prompted Sweden-based Aimpoint (Hall 6, Stand G370) to introduce the Aimpoint Acro (advanced compact reflex optic) series. Designed for direct integration onto pistol slides, the Acro P-1 sight can also be used as a back-up sight for magnifying scopes, personal defence weapons, or on any system where a small red-dot is applicable.

Having undergone test firings of a minimum 20,000 rounds on a .40 calibre pistol slide, it is the only sight in its size category fully tested for shock, vibration, temperature span and other environmental stresses. It has proven itself as the leader in ruggedness and reliability in its size category.

Fully submersible to 25m, the non-magnifying, parallax-free optic features a 3.5 MOA (minute of angle) red dot for fast target acquisition.

Transport d



Equipment of all kinds needs to be transported safely, no matter the environmental and climatic conditions. The Suprobox range developed by Turkish company Makel Uluslararası (Hall 5A, Stand A760) offers an innovative solution. As the company explains: "Once placed in a Suprobox case, your delicate equipment and instruments are transported and used under complete protection from shock,

Early fix

BY SAM J BASCH

Israel-based 3DOR Simulations (Hall 6, Stand D712) has launched an innovative simulation system for project optimisation. The system allows for the testing of products and components throughout the project's life cycle, from planning to field operation. Researchers and developers are therefore able to identify and fix any design issues or errors at an early stage. Not only can product development

Delicate gear in safety



vibration, moisture and impact.”

The cases are manufactured as a solid uniform structure, making them extra resistant to impact and vibration, and enabling them to be handled and transported in extreme conditions. A special silicone seal makes them waterproof and resilient to humidity, salt, sand and dust. The cases are approved for use in temperatures from -40°C to +65°C and can be fitted

with optional pressure relief and humidity indicators.

The Suprobox range is built to MIL-STD-810G standards in multiples of 10cm sizes, which makes them ideal for standard palletising and metric packaging options.

A key feature is the stacking and storage of the same or different-sized cases. They all interlock, even at a 90° angle and transported as thus, which affords extra space savings. Gridlines on the lid allow for pallet strapping.

Certain models feature built-in edge casters for easy manoeuvring and carriage. The edge casters are flush-mounted to fit in with the stacking feature.

According to Makel Uluslararasi, clients can benefit from its flexible manufacturing approach. Depending on a client's specific requirements, a bespoke case could be designed and manufactured in a small order and delivered in relatively short time. ■



be taken to the next level, but it avoids the costs of late stage changes.

As Amir Fishman, chief executive of 3DOR Simulations explained: “The capabilities of our system enable shortened schedules, saving time and resources spent on field

experiments, improving performance, lowering development costs and reducing the cost of the end-result product.”

Offering very fast simulation execution times, the system requires minimal hardware and is capable of running thousands

Zip it!

For anyone familiar with the frustration, if not embarrassment, of a zip failing, leaving a bag, tent or item of clothing gaping open or unopenable, there is a solution from CTF Enterprises represented by the US Department of Commerce's Office of Textiles and Apparel (Otexa) (Hall 5A, Stand C542).

The FixnZip is a zip slider replacement that repairs zips anywhere, anytime without the need for tools or sewing. Ideal for military, police, security and naval personnel, as well as

civilians, the device comes in three sizes corresponding to the actual zip that should be part of their kit. It works on the tooth and coil of metal, nylon and plastic zips.

For the repair operation, attach the FixnZip anywhere on the zip, tighten the thumbscrew and pull the toggle to once again lock the separating halves. It works on opened and closed-end zips, and is strong enough for luggage and wetsuits.

This useful device was the brainchild of US inventor Chris Felix, who established his small business in 2007 to develop and market the FixnZip. ■

Next-gen DAS for F-35

Lockheed Martin has selected Raytheon to develop the next-generation distributed aperture system (DAS) for the F-35 Lightning II. The system comprises six infrared cameras located around the aircraft that provide a spherical view of its surroundings to the pilot's helmet display, by day or night.

Northrop Grumman is the current provider, but the Raytheon system is expected to be introduced at production lot 15 – in around 2023. Raytheon's solution promises significant life-cycle cost savings, performance enhancements and a five-fold improvement in reliability. ■

of scenarios. It uses multiple levels of graphical interfaces and performs visual analysis for a large number of parameters in minutes using a standard laptop.

By having a generic system, simulation adjustments can be made quickly to meet specific needs of any given project, allowing a high level of dynamic 3D performance analysis at the earliest stages. It can adjusted for any number of projects, such as for precision-guided weapons, warheads, munitions and personal armour and armoured platforms. ■

Distant strike

A new concept for artillery ammunition from Norway-based Nammo (Hall 6, Stands F290/GF303), will enable a modern artillery system to hit a target with precision accuracy more than 100km away. The design is based on a compact solid-fuel ramjet launched from a cannon in a collaboration between ammunition and rocket engineers at Nammo. Test firing is planned for 2019-20, with the artillery ammunition concept likely to be operational around 2023-24. ■

REGIONAL FOCUS

NORTH AMERICA

United States

The president's FY19 budget request reveals top-line spending on ground systems increases from USD11.2 billion to USD15.9 billion (4.7%), including many systems other than ground vehicles.

When vehicles alone are considered, (Army – weapons & tracked combat vehicles and other procurement, and the Marines – weapons and combat vehicles and support vehicles), the budget requests increased from FY18 to FY19 by approximately 48%. Much of the increase in the top ground vehicle programmes is from three programmes. The M1 is up 118% over last year, with M1A2 System Enhancement Package Version 3 and R&D funding toward Version 4. The Joint Light Tactical Vehicle (JLTV) will ramp up production by 80%, and Bradley funding is up approximately 30% over last year because its replacement is still a long way off.

The top ground programmes rotate annually and spending shifts between R&D to procurement. However, the majority of the programmes have returned to the top 10 list with FY19. Only Paladin and the

Amphibious Combat Vehicle (ACV) have negative trends. The overall spending on these top ground programmes for FY19 is approximately USD8.1 billion, up from USD5.5 billion in FY18.

Upgrading platforms and mission systems rather than procuring new systems continues to be the focus in the US, with the exception of the Joint Light Tactical Vehicle (JLTV) and ACV. The Armored Multi-Purpose Vehicle (AMPV) represents a hybrid programme using new technology fitted to existing platforms.

There were no significant programme cancellations or delays over the past year. In fact, despite ongoing continuing resolutions and a protracted budget process, the military ground vehicle market remains very positive, with only two highlighted programmes declining compared with last year. The M109A7's decline is temporary and rebounds from FY20 through FY23. The amphibious combat vehicle programme is ending R&D and will soon be positive as it shifts into production.

United States land vehicle forecasts (2017-2026)

The US, with a five-year CAGR of 10.6% and a market value of USD81.5 billion, dominates the Americas region overall, accounting for 85.6% of procurement.

The top US programmes are:

- JLTV (USD12.3 billion), with production completion for the US Marines expected by 2023 and continued production for the US Army.
- M1 Abrams (USD8.4 billion) with M1A2SEPV2 and v3 and Abrams Modifications.
- Stryker (USD8.1 billion) with continued modifications such as double-V hull and lethality spending.
- M2/M3 Bradley (USD6.6 billion).
- M109A7 (USD6.5 billion).

For some time the US has focused on upgrades to existing vehicles, with the JLTV being the only completely new-build programme. Other programmes were in development; however, they did not reach production milestones.

With programmes such as the amphibious combat vehicle and mobile protected firepower (MFP) progressing, new production is gaining ground. The future fighting vehicle and light armoured vehicle (LAV) replacement are also on the horizon.

Companies

Top suppliers to the region start with General Dynamics with USD20.1 billion, accounting for 21% of the total market (up USD3.1 billion). Its revenue is chiefly dominated by main battle tanks (MBT) at 42% and armoured personnel carriers (APC) at 16%, for a total of USD11.8 billion. The Abrams, Piranha/Stryker and light armoured vehicle (LAV) families dominate sales to the region.

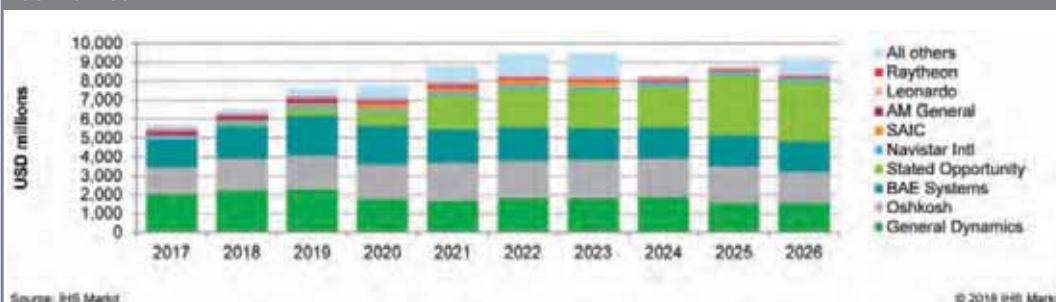
BAE Systems holds second place by market share with 19% and USD18.1 billion forecast over the period. Revenue is primarily derived from self-propelled artillery (SPA) with 36% and infantry fighting vehicles (IFV) with 36%, for a total of USD13.2 billion. Major programmes are the M2/M3 Bradley and the Paladin, making up USD13 billion or 72% of BAE's sales in the region.

Oshkosh has a similar forecast of USD18.1 billion, representing 19% of the total market share. 91% of revenue is derived from logistics vehicles (USD16.5 billion) and 7% from APCs (1.2 billion). Major programmes include the Joint Light Tactical Vehicle (JLTV) and the families of medium and heavy tactical vehicles (FMTV/FHTV), with USD12.2 and USD4.2 billion respectively.

Key facts: US market



US market



KEY LAND PROGRAMMES

M1 ABRAMS (MOD)

Overview

The Abrams main battle tank has been in service for more than 30 years. It exceeds its space, weight, and power-cooling (SWaP-C) limits and has shortcomings in network capability, survivability and lethality. In order to restore lost capability, the army has initiated Engineering Change Proposals (ECP) and modification programmes to address these shortcomings. The ECP provides hardware and other updates for hosting future technologies to keep the M1 capable until 2050.

The Abrams Modification Programme (MOD) applies modifications to the fielded vehicles, including Active Protection Systems, Blue Force Tracking, Mounted Family of Computer Systems, Total Integrated Engine Revitalization and Transmission Enterprise.

The Abrams Upgrade Programme upgrades M1/M1A1 tanks to the M1A2 System Enhancement Package (SEP) configuration enhancing survivability, the power pack, computer systems and night vision capabilities.

FY19 budget

FY19 funds (USD1.5 billion) procure 135 M1A1 vehicle variants to the M1A2 System Enhancement Package (SEP)

v3, to enhance survivability, power pack, computer systems and night vision capabilities.

M1 Abrams Tank Mod (USD962 million) procures the Ammunition Data Link and CROWS Low Profile weapon system and supports total integrated engine revitalization and transmission programmes. R&D funding (USD165 million) supports engineering change proposals to restore lost capability, and accommodate inbound technologies, lethality, power and completes live fire T&E.

JOINT LIGHT TACTICAL VEHICLE (JLTV)

Overview

The Joint Light Tactical Vehicle (JLTV) is a joint programme to replace the High Mobility Multipurpose Wheeled Vehicle (HMMWV). The JLTV concept is based on a family of vehicles focused on scalable armour protection and vehicle agility, and mobility required of the light tactical vehicle fleet. The JLTV will provide defensive measures to protect troops while in transport, increase payload capability, and achieve commonality of parts and components to reduce the overall life-cycle cost of the vehicle.

The JLTV project seeks to optimise performance, payload, and protection of the crew and

vehicle while ensuring a design that is transportable by CH-47, CH-53 and C-130 aircraft.

The programme achieved Milestone C in October 2015. The JLTV contract for low-rate initial production (LRIP) of 16,901 vehicles was awarded to Oshkosh on 24 August 2015.

FY19 budget

JLTV (USD1,961.5 million) funds the procurement of 3,390 vehicles for the Army, 1,642 for the Marines and 81 for the Air Force. JLTV is the critical replacement for the HMMWV and will supplant significant portions of the light wheeled tactical fleets of all services by 2041.

Other FY19 budget activities include modular armour kit procurement, ECP to include retrofits, programme management, fielding, systems engineering, technical support, and training aids, devices, simulators and simulations (TADSS).

Programme plan: procure 49,099 vehicles for the Army and 7,613 for the Marines and 441 for the Air Force.

M2/M3 BRADLEY

Overview

The Bradley Infantry Fighting Vehicle (IFV), in service since the early 1980s, exceeds its SWaP-C limits and is undergoing upgrades and modifications.

The Bradley Programme (MOD) procures upgrades, supports engineering and survivability enhancements, and procures active protection systems. The Bradley programme upgrades the existing Bradley M2A2 ODS SA/M7A3 vehicles to the Bradley M2A4/M7A4 configuration in support of the European Reassurance Initiative (ERI). The Bradley Improvement Programme includes third-generation FLIR integration and other fire control systems.

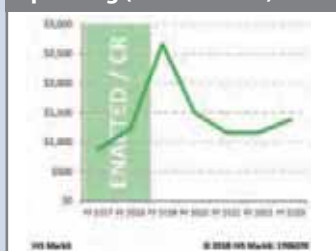
FY19 budget

FY19 funds of USD880 million modifies 149 base and 61 OCO vehicles including the upgrade kits for suspension, track, power train and electrical. It funds obsolescence of the Bradley Advanced Training System (BATS) and supports the conversion of 61 M7A2 ODS-SA vehicles to the M2A4/M7A4 configuration.

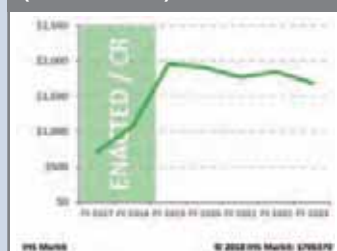
The Bradley Improvement Programme (USD167 million) assists with space, weight and power-cooling issues. FY19 funding will integrate third-generation FLIR into the commander's independent viewer.

Programme plan: current projections indicate that the Bradley Infantry Fighting Vehicle will likely remain in the armoured brigade combat team formations until the 2050s.

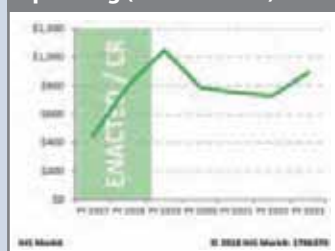
M-1 Abrams programme spending (USD millions)



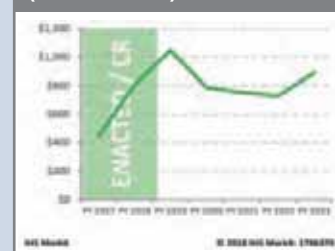
JLTV programme spending (USD millions)



Bradley programme spending (USD millions)



AMPV programme spending (USD millions)



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ARMoured MULTI-PURPOSE VEHICLE (AMPV)

Overview

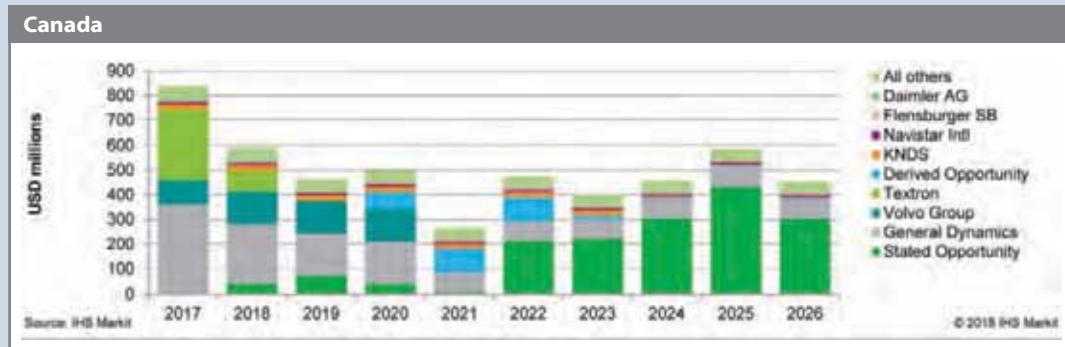
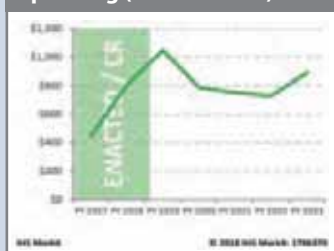
The Armored Multi-Purpose Vehicle (AMPV) will replace the M113. The AMPV will have five mission roles: general purpose, medical treatment, medical evacuation, mortar carrier and mission command.

The current M113 Armored Personnel Carrier mission equipment packages (MEPs) will be integrated onto a new hull based on the Bradley Fighting Vehicle design to give the Army its required capability at an affordable cost. 2,907 vehicles are the objective for the programme to support echelons below brigade level. An additional 1,922 vehicles are planned for echelons-above-brigade in a follow-on programme, yet to be finalised.

FY19 budget

FY19 base procurement dollars in the amount of USD479.8 million procures 131 Armored Multi-Purpose Vehicles (AMPVs) representing year two of LRIP and support. FY19 OCO procurement (USD230.4 million) supports unit equipment sets to support the European Deterrence Initiative and will procure 66 AMPVs and related mission systems and training. R&D funding of USD118.2 million supports the completion of the EMD contract.

Paladin programme spending (USD millions)



Programme plan: AMPV will replace the M113 in five variants with approximately 2,907 vehicles planned as general purpose, medical treatment, medical evacuation, mortar carrier and mission command.

PALADIN INTEGRATED MANAGEMENT (PIM) – M109A7 (MOD)

Overview

The Paladin Improvement Programme (PIM), now designated the M109A7, builds on the advances made in the M109A6 upgrade and integrates components of the Bradley, the cancelled Future Combat Systems, and the current M109 fleet onto a new chassis.

The M109A7 family of vehicles consists of two individual vehicles, a tracked self-propelled howitzer and a carrier ammunition tracked that provides operational support. The M109A7 provides improved sustainability through a newly designed hull; modified M2 Bradley infantry fighting vehicle power train, suspension system, and track; and a modernised electrical system, which replaced the existing hydraulic gun and turret drive systems to all-electric systems.

The programme allows for heavier armour packages and future upgrades. This programme

will extend platform life into the 2050s.

FY19 budget

Funds 36 PIM systems made of one self-propelled howitzer and one carrier ammunition tracked. FY19 base procurement (USD351.8 million) supports full-rate production of 30 self-propelled howitzers and 30 carrier ammunition tracked.

FY19 OCO (USD67.0 million) supports a requirement for unit equipment sets for the European Deterrence Initiative. The manufacturing and assembly of subsystems; the integration, test and check-out operations that results in the production of six self-propelled howitzers and six carrier ammunition tracked (one battery).

The programme plan is to field and support a fleet of 574 PIM systems.

Canada

Canada and the US are closely linked economically. The basic fundamentals that support the Canadian economy are intact and continue to form the basis on which the long-term outlook has been determined. Outer year forecasts declined slightly in 2014 and 2015, but not enough to derail the overall upward growth trend.

Over the near-term forecast

Key facts: Canada



horizon, 2015 came in at 0.9% GDP growth, indicating the recession was slightly worse than anticipated. Supported by net trade and household spending real GDP growth rose to 1.4% in FY 2016 before increasing to a much improved growth rate of 3.0% in 2017.

It is expected that GDP growth rate will return to a more sustainable 2.1–2.3% pace in 2018–20, dropping to 2.1% in 2021 and beyond.

Defence spending

The National Defence portion of the budget is CAD18.7 billion or 7.24% of Canada's budget, slightly less a percentage than last cycle. This figure is as stated in the main estimates and owing to the complex nature of military procurement programmes (such as the fixed-wing search and rescue aircraft and the army's light armoured vehicles [LAV]) causing procurement delays, adjustments to these and other major capital projects have led

to capital funds being shifted into future years' plans. In fact, this budget defers DND funding in the amount of CAD8.48 billion (USD6.34 billion) from near-term defence programmes to programmes in the decade of the 2030s; this amounts to the single largest military programme deferment in Canadian history.

Combining last year's CAD3.7 billion defence reallocation until after 2020 and the CAD8.48 billion deferment of this budget cycle, Canada has deferred about CAD12.2 billion of military capital costs to the period 2020 through to 2035 or later.

Canada commenced a Defence Policy Review in early 2016, which theoretically will provide more details about acquisitions and funding for the Canadian Armed Forces.

It is not clear how these budget deferments will affect the start of the Canadian F/A-18 Hornet replacement and

Canadian Surface Combatant (CSC) programmes, both of which will need large capital budgets.

The Army budget started falling in 2012 as a withdrawal from Afghanistan was implemented. Although personnel increases and the need to maintain an effective army will uphold the army's proportion of the budget, the relative importance will begin to decline due to modernisation efforts in the other armed services. Commanders stated that 22% of the Army baseline budget has been cut, affecting training and infrastructure spending.

Procurement in 2017-18 accounts for about USD2.165 billion or about 13.5% of the defence budget.

Canada land vehicle forecast (2017-26)

Canada's five-year CAGR of -10.8% and a market value of USD5.0 billion accounts for

5.3% of the region's end-users. The forecast is made up of the Light Armored Vehicle (LAV) III Upgrades (USD1.37 billion) and Medium Support Vehicle System (MSVS), with USD500 million forecast. The Tactical Armored Patrol Vehicle (USD367 million) sees the end of production of 600 vehicles through 2018.

The negative growth for Canada is a result of relatively expensive programmes wrapping during the forecast window including the LAV upgrade and TAPV. The combination of these vehicles represent a variety of vehicle segments that will perform IFV, APC and reconnaissance roles for the foreseeable future.

Stated opportunities for Canada represent USD1.0 billion over the forecast, mainly concentrated on the logistics vehicle modernisation (LVM) programme and all-terrain vehicles.

We also forecast derived

opportunities for air defence vehicles (USD310 million) to replace M113s currently filling this role and Leopard 2A4 upgrades with a forecast value of USD39 million.

Major functional segments

The most in-demand functional segments for the Americas are led by logistic support vehicles with a market share of 28% for the region and market value of USD26.6 billion. The CAGR of 12.1% is dominated by the JLTV programme.

APCs account for 16% of the market share and a CAGR of -3.0%. The forecast value is USD15.5 billion, led by the AMPV, Stryker and Guarani.

Tanks account for 13% of the ground vehicle market, with Abrams, Leopard and TAM accounting for 73% of the segment.

IFVs have a 6.2% CAGR and USD9.5 billion forecast chiefly from the Bradley programme. ■



1 Logistics Support

- Account for 28% of the region
- Leading programs are JLTV, FMTV, FHTV and HMMWV accounting for 68% of the segment for the Americas. JLTV is once again the largest program accounting for 46% of the spending.

12.1%
Five-year CAGR
USD26.6 billion
2017-26 market value

2 APC

- Account for 16% of the region
- Leading programs are AMPV, Stryker and Guarani account for 66% of the segment.
- Wheeled variants make up 69% of the segment with a CAGR of -10.6% while tracked vehicles are 28% of the market with a CAGR of 27.8%.

-3.0%
Five-year CAGR
USD15.5 billion
2017-26 market value

3 Tank

- Account for 13% of the region
- Leading programs are M1 (70%), Leopard and TAM accounting for 73% of the segment.
- For production in the region, 70% are modification or upgrades with the remaining 30% being for new vehicles.

12.5%
Five-year CAGR
USD12.1 billion
2017-26 market value

4 IFV

- Account for 10% of the region
- Leading programs are Bradley (69% of the segment), Ground Mobility Vehicle and the Stryker/Piranha/LAV families. These account for 87% of the segment.
- Tracked IFVs make up 73% of the segment with while wheeled vehicles are 20% of the segment.

6.2%
Five-year CAGR
USD9.5 billion
2017-26 market value

SECURITY

Perimeter issues are not

Airport perimeter security is characterised by a blend of traditional and modern methods, says Ben Vogel

Effective perimeter protection involves rapid identification of potentially hostile or illegal activity, before the risk escalates and poses a danger to people and critical assets.

In planning perimeter security at an airport, it is necessary to conduct careful risk analysis to determine potential threats. The level of expected damage and the likelihood of occurrence determine the risk potential, which can then be used to establish security objectives and vulnerability.

"An airport can be threatened from a number of directions, so dividing the perimeter into clearly structured zones helps to determine security measures that make it possible to prepare rapid and secure response to any scenario," says Gert Rohrmann, technical manager for the solutions division of Siemens Building Technologies UK.

A systematic approach involves adopting a zone-based methodology to monitor the path of a subject across a scene over a period of time. This enables analysis of multiple factors such as speed, direction, size, and shape to distinguish a potential intruder from a false alert.

"Sensitive areas can be protected by alarm zones, and virtual barriers can be created where it is inappropriate to install physical fences," Rohrmann notes. "Alarms can be prompted

by simple activities such as vehicles or individuals moving into restricted areas, or via complex parameters such as object speed or size. Secure zones are generated by creating area boundaries on digital site maps, and adjusted using preset shortcuts to respond to changing requirements."

Effective perimeter security detection will also protect the airport apron where aircraft are parked, loaded, unloaded, and refuelled. Systems include long-range conventional video and thermal-imaging surveillance cameras, motion detection sensors, and ground-radar detection and tracking. Thermal-imaging cameras can be used to record individuals and objects over long distances without additional light sources and they have the advantage that they are much less affected by snow, mist, or fog, making them a viable choice for challenging locations.

"Command and control platforms integrate security devices across multiple airport locations, manage critical situations, and enhance procedures, creating significant efficiencies by delivering improved intelligence, information, and advanced reporting," says Rohrmann. These new-generation software solutions will incorporate legacy equipment and adapt to specific airport corporate policies as well as regulatory guidelines.

Fence technology

The fence as a physical barrier retains its importance. In November 2017, for example, HAVERKAMP announced a follow-up, multimillion-euro order to provide its AluGARD aluminium alarm fence for perimeter security at Frankfurt Airport.

HAVERKAMP had previously completed 11km of aluminium fencing at the German hub, and it was selected again by operator Fraport after an international competitive tender. AluGARD will replace a concrete fence to protect a 6km section of the perimeter at Frankfurt, near Runway 18/36 (known as Runway 18 West).

AluGARD is made completely of aluminium, giving the fence high resistance and durability. The system can be augmented by climbover detection and tunnelling protection technologies. HAVERKAMP claims AluGARD is virtually free of false alarms, and displays extremely high alarm reliability in the event of an actual attempt to penetrate the perimeter.

Its basic structure comprises aluminium posts of a range of sizes and diameters, with plug-on modules for quiescent current monitored climbover detection with top Y-beams, as well as climbover detection based on infrared (IR), laser, video sensors, and LED lighting modules.

There were periods when chain-link and palisade fencing

predominated; nowadays, the trend is more towards welded mesh from designers such as Cochrane. "All our designs are ICAO compliant," Daniel Burnstein, UK and Europe director, explains to Jane's. "We also offer different types of welded mesh systems, which give high levels of security while also being aesthetically pleasing designs."

The Cochrane philosophy is that a perimeter fence at an airport should not give the impression of incarceration to passengers, as this suggests they are in an unsafe environment. "The psychological aspects of security are of paramount importance, so a fence should look good and maintain a crisp line all the way through even if it has such security enhancements as spikes or concertina coils on top," says Burnstein.



peripheral

Welded mesh offers enhanced security aspects that palisade fencing cannot, he adds. For example, some palisade fences have blind spots, which require the deployment of additional CCTV cameras. Welded mesh has no such disadvantage.

Cochrane engineers ensure that airport customers stipulate their requirements. "Are they trying to stop people or vehicles, or both?" Burnstein asks. "If it is just vehicles, we might simply advise them to change the design of an access road to reduce speeds or even provide an anti-ram barrier to counter hostile vehicles."

Cochrane has sold perimeter fencing for infrastructure protection around the world: examples include airports in Malaysia, Nigeria, Saudi Arabia, Singapore, the United Arab Emirates, the UK, and the US.

Customers require a return on

their investment, so the fence must be designed to relevant national standards in and coated to last at least 20 years. Polyvinyl chloride (PVC), once the coating of choice, is now regarded as a toxic substance. It is still used, but it has been replaced at Cochrane by a proprietary coating guaranteed for about 15 years.

Radar-based surveillance

A recent entrant to the airport perimeter protection market is Magos Systems. Gadi Bar-Ner, vice-president marketing and business, claims its radar-based SR-500 solution is "the ultimate perimeter protection suite" for airports that require enhanced capabilities.

Other perimeter radar systems are already on the market, but Bar-Ner insists Magos can leverage any legacy closed-circuit television (CCTV) or video management software (VMS) systems installed at an airport. "Whatever they are using, we will find a way to augment it," he says.

The SR-500 is designed to detect a person at up to 500m range, with continuous coverage of a 120° area. Once operational, it can easily differentiate between the natural events and movements by a human or animal towards the perimeter. Video analytics then determine what is actually being seen. A single radar can cover a 250,000m² area. It can be mounted at various heights depending on the operating environment and lines of sight, although Magos recommends 6-8m.

Bar-Ner explains that the radar can work in a geofenced area, within which only abnormal events will trigger alerts. Not only will the radar ignore all movement outside that area, but it can also be asked to exclude movement within certain blocks inside the geofence. This is to prevent unnecessary alarms from being triggered.

"The security manager can receive alerts by text, or video can be streamed to a mobile app. It all depends on the capabilities of the VMS and on what the customer wants," says Bar-Ner.

"Although our competitors have very good technology, nobody beats our ratio of coverage: per price, per performance," he adds, noting that the field-of-view with a standard radar is typically 90° horizontal and 10-20° elevation – but the SR-500 delivers 120° and 30° respectively. "Our power consumption is less than 3W per radar, which means we can install it very easily using a solar panel."

However, the most innovative aspect of the company is that all signal processing is done inside the radar sensor, so no external hardware is required. As a result, bandwidth use is less than 1kB per second, compared with up to 1GB with other radar units.

HGH Infrared Systems manufactures the Spynel brand of thermal-imaging technology, which is suitable for the type of wide-area surveillance required at airports. "Spynel cameras produce a panoramic thermal image with a high frame rate. We also provide the analytical software required to automatically detect and track moving objects within the panoramic image," says HGH director of sales Edouard Campana. He mentions sales to

airports in Argentina, Martinique, Saudi Arabia, the United Arab Emirates, and the US.

Spynel sensors can be produced for short- (500m) or long-range (up to 8km) coverage. One long-range sensor can cover a significant part of an airport perimeter; the same zones can also be monitored by three medium-range sensors or short-range sensors, depending on deployment. "At up to 8km, we can still detect a person and can even differentiate between a horse and a human being. The closer the target gets, the more detail can be seen," says Campana.

In some applications, airports use HGH technology for early warning detection, especially when people approach the perimeter from the public side of the fence. If one or more individuals enter the restricted area, Spynel can track all targets.

"In conventional surveillance, a single camera can only track one intruder, whereas Spynel produces a 360° video that allows multiple intruders to be constantly monitored," says Campana.

Spynel is a fully passive technology, which means it does not disturb other electronic equipment, giving it a significant advantage over active systems such as radar in airports. Its passivity also means it requires no certification, unlike radar. Units can work at a temperature range from -40°C to +71° and are not affected by adverse ambient conditions.

Spynel is usually installed by third-party integrators rather than HGH. In the field, sensors can be linked by wi-fi, copper wires, or fibre-optic cabling. Furthermore, if required, analytics can be loaded into the sensor and all analysis is undertaken there. ■



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EN BREF

■ Le **ministère français des Armées** évalue à 2,5 M€ son futur achat de répliques d'armes Airsoft (fusils d'assaut HK416F et Famas F1, mitrailleuses Minimi FN Herstal, pistolets Pamas, et Glock 17), leurs accessoires, les recharges et consommables. **(Stand 5aF20-178-268/6K616/6E198/5aK367)**

■ Le Danemark va louer auprès d'**Airbus Defence & Space** (Norvège) deux canaux UHF TACSAT militaires 5kHz. **(Stand 5aC158)**

■ **Ruag Ammotec Austria** a reçu un marché de 11,5 M€ pour la fourniture de munitions de 5,56x45 mm pour les fusils d'assaut StG 77 Steyr Aug autrichiens. **(Stand 6K110/5aH437)**

■ Le **ministère belge de la Défense** recherche des munitions de 30x173 mm APFSDS-T pour la période 2018-2021.

■ Le système Livingstone (station sol ISTAR – Intelligence, Surveillance, Target, Acquisition & Reconnaissance) britannique bénéficie de l'assistance de **General Dynamics** (Royaume-Uni) pour sa maintenance, les

réparations nécessaires et sa conservation (2,635 M€).

■ La réparation et la maintenance des LRU (Line Replacement Units) des RWS (Remote Weapon Station) Protector, livrées par **Thales/Kongsberg Defence & Aerospace** à la **British Army**, ainsi que la remise en état de ces tourelles téléopérées, ont été confiées à Thales Optronics (Royaume-Uni). **(Stand Pe6B500)**

NEWS / ACTUALITES

OUTDOOR LIVE DEMONSTRATIONS PROGRAMME / PROGRAMME DES DEMONSTRATIONS DYNAMIQUES EXTERIEURES

Today at 09:45 a.m. / Aujourd'hui, à 09:45

In a new area, closer to the exhibition, the Eurosatory 2018 outdoor live demonstrations are the theatre of Security and Defence of today with: automated convoys, robotics, law enforcement, less than lethal use, protection, surveillance, and combat. The area provides the scene to display vehicles and operating systems in action. Complemented by wide-screen projections, these demonstrations boost exhibitor visibility at the

event and promote their products / *Avec plus de décors, le Show des démonstrations dynamiques d'Eurosatory 2018 est le théâtre des opérations de Sécurité et de Défense d'aujourd'hui, avec des missions de convois automatisés, de maintien de l'ordre, avec utilisation progressive de la force de protection, de surveillance, et de combat. La zone d'évolution tactique a totalement été repensée. Cette année, on y accède à pied. Elle permet de présenter*

des matériels et des systèmes en action. Une mise en scène opérationnelle et l'utilisation de renvois d'image en direct sur grand écran assurent le succès de cette activité qui reste une originalité du Salon. Cette présentation à but professionnel apporte l'information essentielle que ne peuvent offrir les brochures et les vidéo-clips. Pour Eurosatory 2018, sont présentés des produits du domaine Sécurité aussi bien que de celui de la Défense.

TODAY'S MAIN EVENTS / EVENEMENTS DE LA JOURNEE

Defence and Security careers Day by GICAT / Dominante du jour : Journée des métiers, par le GICAT

- **09:00** – Exhibition opens / *Ouverture du Salon*
- **09:00-17:00** – Career – Defence and Security Professions Day / *Orientation – Journée des métiers Défense & Sécurité (Room 2)*
- **09:45-10:45** – Outdoor live demonstrations / *Démonstrations dynamiques extérieures*
- **11:00-12:00** – Start-Up - Defence & Start-Ups: which leads the other? / *Start-up - Défense et start-up: qui fait avancer l'autre? (Eurosatory Lab)*
- **16:00** – Exhibition closes / *Fermeture du Salon*

EXHIBITION OPENING HOURS / HORAIRES D'OUVERTURE DU SALON

Friday, June 15, from 9 a.m. to 4 p.m. /
Vendredi 15 juin 2018, de 9 h à 16 h

VEHICLES AND EQUIPMENT MANŒUVRES / MATÉRIEL ET ÉQUIPEMENTS EN ÉVOLUTION

Aeneas Formation (France) – Armed Private Security / *Sécurité privée armée dans les transports* ■ **Arquus** (France) – Military vehicles (Sherpa) / *Véhicules militaires* ■ **Azur Drones** (France) – UAV systems (Flying Guard FG-800) / *Drone* ■ **Daimler** (Germany) – Military vehicles (LAPV & Unimog) / *Véhicules militaires* ■ **FN Herstal** (Belgium) – Weapons and ammunition (deFnder RWS) / *Armes et munition* ■ **Isuzu Motors** (Japan) – 4x4 vehicles (D-Max) / *Véhicules 4x4* ■ **Manitou** (France) – Logistics / *Logistique* ■ **Milrem Robotics** (Estonia) – Robotics (THEMIS) / *Robotique* ■ **Protecop** (France) – Personal Protective Equipements (demining) / *Équipements de protection individuelle (déminage)* ■ **Sides** (France) – Special vehicles (Fire Fighting) / *Véhicules spéciaux (lutte anti-incendie)* ■ **Spartan Military** – **Cybergun** (France) – Airsoft Training Weapons / *Armes d'entraînement Airsoft* ■ **Streit Group** (Canada) – Military vehicles (Sherp) / *Véhicules militaires*

RENDEZ-VOUS IN 2020

COGES (Commissariat Général aux Expositions et Salons du GICAT), the organiser of Eurosatory 2018, would like to thank the 1,813 exhibitors representing 64 countries and the 227 delegations from 99 nations and international organisations (at the time going to press) for their participation this year. They have made the exhibition a major success.

COGES would like to remind every one that Eurosatory 2020, the largest international exhibition devoted to Land & Air Land Defence & Security, will take place in Paris-Nord Villepinte between 11 and 15 June 2020. Full information may be obtained from the organiser and by logging on to the Internet site: www.eurosatory.com

FAREWELL, BYE-BYE, MERCI, AU REVOIR ET A BIENTOT!

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